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TABLE OF CONTENTS

JKI

EVALUATION OF TEBET ECOPARK MANAGEMENT BASED ON ECOTOURISM PRINCIPLES

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Article Info	Abstract
	Urban settings could have significant effects on how nature-based tourism develops. This study aimed to assess how ecotourism principles are currently put into practice at Tebet Eco Park (TEP), one of the urban parks in DKI Jakarta Province. It was also expected to recommend strategies for the maximum application of these principles to facilitate TEP to be a prominent urban ecotourism attraction. The research employed a qualitative descriptive methodology, involving data collection through field observations, interviews, and secondary data analysis. The research findings revealed that TEP has incorporated ecotourism principles, such as environmental conservation, local economic contributions, cultural preservation, education, and local community participation. However, the implementation of these principles has not been thoroughly optimized. Several indicators require refinement in their implementation, for example, the management should conduct scientific assessments related to TEP's carrying capacity which is crucial for environmental sustainability. Promoting TEP can lead to the establishment of a sustainable nature-based park in the urban landscape. This, in turn, can optimize the benefits for the local community and the entire population of Jakarta. Furthermore, the success of the implementation can also serve as a model for other nature-based urban parks in both Jakarta and other regions.

INTRODUCTION

As one of the urban tourism destinations in Indonesia, DKI Jakarta (Jakarta) is actively developing nature-based tourism attractions with the city park concept, which are open spaces, predominantly filled with vegetation and water, designed for public use. They can vary in size, from small to large, and are called parks by local authorities (Konijnendijk et al., 2013). In the context of urban tourism development, particularly in urban areas like Jakarta, the discussion surrounding city parks becomes intriguing due to their crucial role, in terms of the natural environment and social aspects of the community.

According to the Department of Parks and Forests of the Jakarta Provincial Government, this province's total number of city parks has reached 1,446 units (Widi, 2022). One of these parks is Tebet Eco Park (TEP). This research pinpoints the potential for TEP to establish itself as a leading urban ecotourism attraction, which according to Sarkar (2016) promotes ecologically-oriented tourism within urban areas. With the concept of ecotourism, urban areas can play a significant role in the development of nature-based tourism. Urban tourism refers to the process of expanding tourism activities within urban areas and utilizing urban resources to create new tourist attractions and products (Athar et al., 2021; Prijadi et al., 2014). Other than that, cities also play an essential role in biodiversity conservation (Aronson et al., 2017; Ives et al., 2016), particularly through conservation planning and the management of urban green spaces (Aronson et al., 2017).

The TEP is situated in an urban area, in South Jakarta City, DKI Jakarta Province, making it a notable urban tourism attraction. Despite its concept as a city park, the primary attractiveness of TEP lies in its nature-based features, particularly the vegetation within. As a nature-based city park, we assess that TEP holds significant potential for development with an ecotourism concept. Ecotourism can be defined as a responsible form of travel, wherein the enjoyment of a natural environment is coupled with educational elements and the promotion of local economic growth (Ayustia & Nadapdap, 2023). Additionally, ecotourism encompasses a conservation-oriented approach, that is dedicated to preserving natural resources for both the present and future generations (Asy'ari et al., 2021). To completely reach TEP's potential for an urban ecotourism attraction, stakeholders, including TEP management, should comprehensively understand and incorporate ecotourism principles.

The development of TEP with an ecotourism concept, is in line with the TEP tagline and follows an eco-park concept: "reconnecting people with nature". This means that each zone within TEP is designed to promote ecological sustainability, social interaction, education, and recreation (Tampi & Mustika, 2022). TEP encompasses a total area of 7.3 hectares, which is sufficiently extensive for a city park and allows for the accommodation of a diverse range of giant plant species. It is this wealth of vegetation that constitutes the primary potential of TEP as an ecotourism-based attraction. The development of TEP, guided by the principles of ecotourism, aims to maximize the benefits of the park, not solely concentrating on environmental preservation but also considering other aspects such as socio-cultural and economic dimensions.

Ecotourism-based management of TEP serves as a strategic measure to anticipate the surge in mass tourism in response to changing tourist preferences post COVID-19. There is a trend among tourists to prefer outdoor tourism during and after the pandemic. For instance, Chinese travelers increasingly prefer destinations anchored in nature, rural

Evaluation of Tebet Ecopark Management Based on Ecotourism Principles
Arum et al. (2024)

Jki

areas, or cultural experiences (Huang et al., 2021). It might be preferred because the environment is relatively less crowded, and it facilitates greater air circulation than indoor tourist sites do (Park et al., 2021).

Researching the implementation of ecotourism principles at TEP is of utmost importance, considering the relatively limited information on this subject. While the TEP has positive social effects on the surrounding community (Putri & Tshania, 2023), there is still room for improvement in its revitalization. One of these focuses on optimizing the use of each existing zone to accommodate a variety of social activities within the community (Tampi & Mustika, 2022). Furthermore, several studies addressed TEP have delved into various facets, including the examination of its facilities and the assessment of its potential to attract visitors (Suryantari et al., 2023), the analysis of the pivotal role that TEP plays in fostering the development of healthy urban areas (Tampi & Mustika, 2022), and the evaluation of the effects of green open space policies on TEP's development for tourism purposes (Putri & Tshania, 2023).

Looking more broadly, a comprehensive evaluation of city park facilities in Jakarta is necessary, covering important aspects like park lighting, benches, waste disposal facilities, parking areas, restroom availability, information boards, drainage systems, and multipurpose areas (Nursanto, 2011; Wibowo & Ritonga, 2016). In contrast to those studies, this research diverges by not evaluating facility-related aspects. Instead, it concentrates on the implementation of ecotourism principles at TEP.

Given this context, this research aims to evaluate the existing condition of TEP based on ecotourism principles, to identify currently well-implemented areas and aspects that require improvement. The expected practical implications of this research are to provide insights to TEP management and the Provincial Government of DKI Jakarta on how to develop a nature-based city park in accordance with ecotourism principles. This approach aims to broaden the benefits gained by the community.

The principles of ecotourism vary across multiple sources. In this research, we employ five ecotourism principles encompassing (1) environmental conservation, (2) economic contribution, (3) cultural conservation, (4) education, and (5) community participation. The environmental conservation principles mandates that ecotourism activities should not cause damage or pollution to the local environment and culture (Cobbinah, 2015). Therefore, environmental conservation is protecting, preserving, managing, or restoring natural resources for current public benefit and sustainable social and economic utilization (Evely et al., 2010). Economic contribution signifies that tourism activities must support local economies, businesses, and communities to ensure economic vitality and sustainability (Dodds & Joppe, 2001; Okech, 2009). It also can be defined as the value added to the economy through activities that promote sustainable tourism in natural areas (UNWTO, n.d.).

Cultural conservation means that tourism activities should promote cultural preservation and respect for local culture (Cobbinah, 2015). The principle of education implies that tourism activities should incorporate educational elements by providing information about the names and benefits of plants and animals in the surrounding tourist area (UNESCO Office Jakarta, 2009). Lastly, the principle of community participation signifies that ecotourism involves the local community, collaborating with local authorities and tourists to meet local needs while providing conservation benefits (Cobbinah, 2015).

Table 1 shows five principles along with their corresponding indicators, gathered from various sources.

Table 1. Principles and Indicators of Ecotourism

Principle	Indicator
1. Environmental conservation (Cobbinah, 2015; Dodds & Joppe, 2001; Okech, 2009; Pasape et al., 2015; Sobhani et al., 2022; UNESCO Office Jakarta, 2009)	a. Protection and preservation of ecosystems to ensure long-term health (Dodds & Joppe, 2001; Okech, 2009) b. Utilization of *renewable resources* (Dewi & Rosyidie, 2008; Ocampo et al., 2018) c. Reduction in the use of non-organic materials (Dewi & Rosyidie, 2008) d. Utilization of eco-friendly facilities *(green technology and recycling)* (Dewi & Rosyidie, 2008; Ocampo et al., 2018) e. Waste management (Sobhani et al., 2022) f. Carrying capacity management (Ocampo et al., 2018; Sobhani et al., 2022)
2. Economic contribution (Cobbinah, 2015; Dodds & Joppe, 2001; Okech, 2009; Sobhani et al., 2022)	a. Economic benefits for the destination (Tiani & Baiquni, 2018) b. Benefits for the local community (Ocampo et al., 2018; Okech, 2009)
3. Cultural conservation (Cobbinah, 2015; UNESCO Office Jakarta, 2009)	a. Presentation of cultural attractions (Dewi & Rosyidie, 2008; Sobhani et al., 2022) b. Availability of food, traditional attire, and local languages (Bhattacharya & Kumari, 2004; Ocampo et al., 2018) c. Promotion of local craft products (Dewi & Rosyidie, 2008; Sobhani et al., 2022)
4. Education (UNESCO Office Jakarta, 2009)	a. Access to information and knowledge about the flora and fauna within the area (UNESCO Office Jakarta, 2009) b. Promotion and education on conservation and sustainability concepts leading to awareness and practices (Ocampo et al., 2018)
5. Community participation (Cobbinah, 2015; Pasape et al., 2015)	a. Involvement of the local community in the planning and development process (Dewi & Rosyidie, 2008; Ocampo et al., 2018) b. Concern and satisfaction of the local community regarding ecotourism (Sobhani et al., 2022)

Source: Authors' analysis, 2023

METHODOLOGY

This research was unfolded in three sequential phases: preparation, data collection, and data analysis. The preparation phase took place from April to May 2023 and involved drafting the research proposal, designing research instruments, and liaising with relevant stakeholders. These stakeholders ranged from TEP management officials, academic experts in the field of ecotourism, as well as local businesses situated around TEP. Following the preparation phase, the data collection unfolded between May and August 2023. During this period, the research team conducted a series of observations and interviews to gather relevant data. Finally, the data analysis phase occurred in August and September 2023. The selection of research informants was determined through a purposive approach, with careful consideration given to individuals who possessed essential knowledge about TEP and could provide the necessary data to address the research questions. The informants

Evaluation of Tebet Ecopark Management Based on Ecotourism Principles
Arum et al. (2024)

Jki

consisted of one TEP management official, two experts (academics) in the field of ecotourism, and three local community business members in the vicinity of TEP.

The first stage of data collection is observations made inside and outside the TEP area. The observation focus within the TEP area was the application of ecotourism principles, including aspects related to conservation, education, culture, and economy. Meanwhile, the observation focus outside the TEP was the economic benefits received by local businesses near TEP. Our observation records carefully documented the insights gathered from these observation activities.

In addition to observations, the next data collection was interviews designed with specific objectives. Interviews with the TEP management official were conducted to delve into an understanding of TEP implemented policies related to the application of ecotourism principles and the exploration of potential future policy directions. On the other hand, conversations with ecotourism experts sought to gain a comprehensive understanding, both theoretically and practically, regarding the development of urban parks through the ecotourism approach. Meanwhile, interviews with the local community and businesses in the vicinity of TEP aimed to ascertain the economic benefits derived directly and indirectly from the presence of TEP for these stakeholders.

Interviews with the informants were conducted face-to-face at agreed-upon locations. The interview with the TEP management official occurred at the TEP office in the Tebet sub-district, South Jakarta. Academics were interviewed on their respective campuses, while interviews with local business owners were carried out at their respective places of business. The duration of each interview varied but typically lasted for approximately one hour. All interview sessions were recorded and stored using a voice recorder for later analysis and reference.

The data obtained from interviews and observation were later analyzed in a descriptive process, which consisted of three stages: data reduction, data presentation, and conclusion drawing. The data reduction process involved transcribing the audio recordings of the interview and observational findings into interview notes and observation records. Moving to the data presentation phase, the information was sorted and simplified in alignment with the research objectives to facilitate analysis. In the concluding stage, the data that underwent reduction were interpreted and contextualized to formulate conclusions.

FINDINGS AND DISCUSSION

Overview of Tebet Eco Park

Tebet Eco Park (TEP), formerly known as Tebet Park, was renamed Taman Honda in 2010 due to a partnership between the Jakarta Provincial Parks and Forest Office and PT. Honda Prospect Motor (HPM). It was revitalized and relaunched as Tebet Eco Park in April 2022. TEP is located in the Tebet Barat sub-district of South Jakarta, within the administrative boundaries of Jakarta, the capital city of Indonesia. The park has direct access to important thoroughfares such as Jalan Tebet Timur Raya and Jalan Tebet Barat Raya, as well as residential streets to the north via Jalan Tebet Barat VII and Jalan Tebet Barat X. Covering a sprawling expanse of 7.3 hectares, this green sanctuary is adorned with an array of lush vegetation.

Thematically, TEP is split into eight zones that serve as public places for both education and recreation. The thematic garden, community lawn, Tebet Eco Park Plaza (serving as the visitor drop-off area), community garden, forest buffer, children's playground, wetland boardwalk, and the iconic TEP feature: the infinity link bridge are all strategically located in the northern and southern areas. Based on observational findings, TEP is ideally positioned quite close to the Transjakarta Tebet Eco Park 2 bus stop and Tebet railway station, making it easily accessible via both of these public transit alternatives. The position of TEP is depicted graphically in Figure 1.
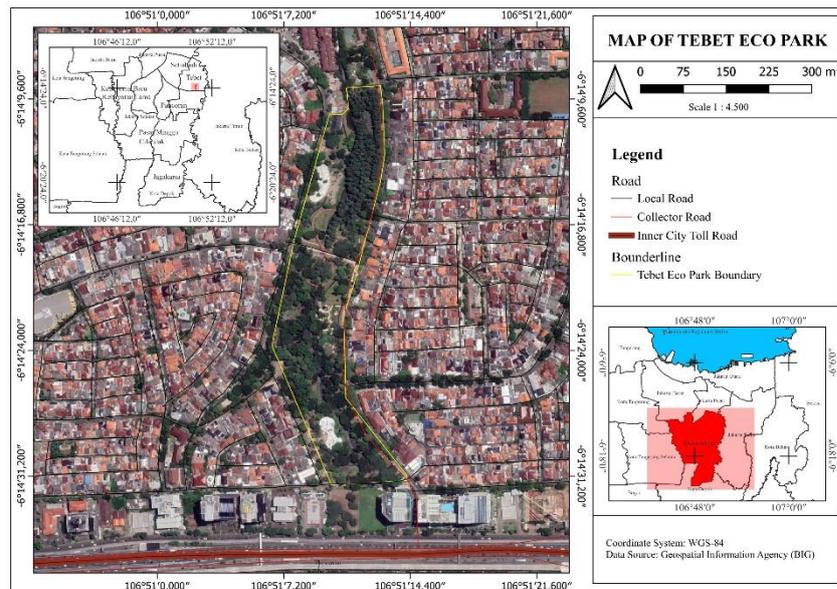
Figure 1. Map of Research Location
Source: Authors' documentation, 2023

Environmental Conservation

In this study, the environmental conservation principle encompasses several indicators such as protection and preservation of ecosystems to ensure long-term health, utilization of renewable resources, reduction in the use of non-organic materials, utilization of eco-friendly facilities, waste management, and carrying capacity management.

One of TEP's roles in protecting and preserving ecosystems is its ability to reduce pollutants and environmental toxins, which is considerably aided by its diversified vegetation. For example, Tabebuya trees *(Handroanthus chrysotrichus)* and Bodhi trees *(Ficus religiosa)* planted along the riverbank and the north entrance of TEP reduce unpleasant odors from industrial and household waste. Moreover, notable tree species like the Rainbow Eucalyptus *(Eucalyptus deglupta)*, Saman *(Samanea saman),* Pulai *(Alstonia scholaris),* and Mimusops elengi flowers *(Mimusops elengi)*, which thrive around the *infinity link bridge*, *wetland boardwalk*, and *community garden* (Sunowo & Hasanah, 2022) collectively improve the environmental quality in TEP, serving as its guardians.

TEP has launched several initiatives in the quest of long-term ecosystem health and protection. *Firstly*, there is an emphasis on plant maintenance, involving the replacement of seasonal plants, a careful evaluation of mature trees to determine whether they require ongoing care or removal, and the implementation of grafting procedures for replanting

Evaluation of Tebet Ecopark Management Based on Ecotourism Principles
Arum et al. (2024)

Jki

damaged vegetation. Regarding the plant replacement technique, TEP management issued the following statement:

> ...*We enforce a policy that for every tree we cut down, ten new trees must be planted. This practice ensures the maintenance of good air quality from the oxygen produced by the trees.* (Informant 01, personal communication, 2023)

The next initiative concerns water cycle maintenance, specifically installing *gabion walls* using bioengineering technology. A *gabion wall* is a flood-prevention measure that employs rocks woven with strong, rust-resistant wire to form hexagonal-shaped openings. *Gabion walls* are installed on each side of the riverbanks to reduce the risk of erosion caused by river flow during rain and to serve as soil reinforcement to prevent landslides on soil walls or slopes.

One of the conservation issues at TEP lies in using chemical-based insecticide liquids for plant maintenance. These liquids can adversely affect the environment, impairing plant life, soil ecosystems, and water quality. To address this issue, the management needs to explore the use of eco-friendly insecticides, such as those generated from basil plant extracts, a combination of taro tuber juice and tobacco extract, and other similar substances.

Regarding resource utilization, TEP still relies on electricity supplied by the State Electricity Company (PLN), which primarily derives its fuel from non-renewable energy like coal, petroleum, and natural gas. To mitigate this environmental impact, TEP management could consider adopting alternative energy sources such as solar panels, which can convert solar heat into electricity. As part of its current energy conservation efforts, TEP has put timer switches on select facilities, such as the infinity link bridge, that operate from 6:00 PM to 11:00 PM local time, as part of its current energy conservation initiatives.

TEP also emphasizes the reduction of inorganic material usage. This effort is reflected in providing separate waste bins to facilitate sorting. The accumulation of non-biodegradable waste can harm TEP's aesthetic appeal, leading to unpleasant odors and soil and water quality degradation. To further minimize the generation of inorganic waste, TEP management should continue to educate visitors about the environmental concerns posed by plastic waste. One effective approach involves creating banners or posters with educational messages for visitors. Through a comprehensive poster campaign featuring captivating visuals, visitor awareness of the adverse effects of such waste can be heightened.

TEP places a strong emphasis on eco-friendly facilities. In alignment with this focus, TEP has launched various efforts to support this goal, including using sustainably harvested wood from within the TEP area for furniture, *playgrounds*, and *boardwalks*. Through these efforts, TEP is dedicated to enhancing its environmental conservation practices as it continues to evolve into an urban park destination driven by eco-tourism.

In terms of waste management, the interviews with TEP management discovered that the park generates approximately 4 m³ of waste per day, equivalent to a truck measuring 240x150x120 cm. Most of this waste was originally from plastic food and beverage containers left by the visitors. Waste management at the park is a collaborative effort between TEP management and the Jakarta Provincial Environment Agency (DLH),

which routinely transports this waste to the Integrated Waste Processing Site (TPST) in Bantargebang, Bekasi City, West Java.

In the case of carrying management, to prevent the prospective effects of over-tourism, TEP management swiftly implemented a series of strategic measures. Foremost among these was visitor control, which allowed a maximum of 10,000 guests per day, divided into two sessions. The first session ran from 07:00 AM to 11:00 AM local time, followed by the second from 01:00 PM to 05:00 PM local time. The purpose of this session-based approach is to provide the TEP ecosystem with sufficient time to recover after each visitation.

Secondly, TEP management also integrated the JAKI (Jakarta Kini) application for TEP visitors. However, the findings from interviews and observations suggested that the visitation sessions were ineffective. Visitors from outside Jakarta were still discovered entering TEP without using the application. As a result, there were deviations in the recorded number of visits, which were then manually inputted outside the application. Although TEP management had implemented visitation regulations based on zoning at the infinity link bridge, the consistent application of zoning in other areas, such as the playground and forest buffer, still needed to be completed.

Economic Contribution

This principle encompasses two indicators such as economic benefits for destination, and benefits for the local communities. Economic sustainability is a crucial factor in successfully managing ecotourism destinations like TEP. TEP's revenue sources are not limited to regional funding; they also include commercial land utilization, such as film production and special event hosting. The revenue generated from these activities significantly contributes to the regional treasury, which is then deposited in Bank DKI, forming a solid foundation for the destination's financial sustainability.

The presence of TEP benefits not only its management but also provides economic advantages to the local community in the Tebet sub-district. TEP has created business opportunities for Small and Medium Enterprises (SMEs). In this regard, TEP development has spurred the growth of restaurants, cafes, and parking facilities operated by local residents in response to the increased number of visitors. One informant, informant 05 (parking lot owner), mentioned that the existence of TEP had a positive impact on his financial situation, providing him with additional income. Moreover, he also noted that he could enlist colleagues' help in managing the parking lot, especially on weekends when visitor numbers tend to surge. Figure 2 illustrates a parking area managed by the community around TEP.

Evaluation of Tebet Ecopark Management Based on Ecotourism Principles
Arum et al. (2024)

Jki

Figure 2. Parking area managed by the community
Source: Authors' documentation, 2023

Correspondingly, informant 04, who runs a business of *nasi kebuli*, also emphasized the significant boost TEP gave to their business. The increased visitation at TEP introduced their *nasi kebuli* brand to a broader audience. On the other hand, informant 06, who manages a beverage business, mentioned that TEP did not directly impact their economic prospects. Nevertheless, TEP plays a crucial role in maintaining the stability of the existing market. This is mainly because its primary customer segment consists of individuals who engage in physical activities around TEP.

The management also takes steps to empower the local economy, particularly Small and Medium Enterprises (SMEs), by providing them with opportunities to set up *booths* within the TEP premises. The Jakarta Experience Board (JXB) facilitates this collaboration between TEP and SMEs. This initiative enables SMEs to expand their operations through a profit-sharing system, with the condition that JXB manages 20% of the profits generated from these vendors. Currently, four SMEs are operating within the TEP area, actively contributing to the local economic landscape.

Cultural Conservation

The principle of cultural conservation consists of indicators such as the presentation of cultural attractions, availability of food, traditional attire, and local languages, and promotion of local craft products. Cultural conservation is a fundamental principle in sustainable development, and TEP's commitment to promoting cultural attractions is a crucial aspect of preserving the local culture. The amphitheater management at TEP further exemplifies this dedication, where cultural performances such as acoustic music shows by the local acoustic community take place. This is a concrete example of how TEP actively promotes and supports community-based cultural activities by scheduling these events throughout Ramadan. The active participation of the local community plays a pivotal role in organizing and making these events successful.

It is advisable to host only large-scale cultural attractions that could bring a high volume of visitors to TEP. This is because TEP is in an ecologically sensitive area, surrounded by dense residential areas. It would be more appropriate to relocate such cultural events to other venues. Moreover, TEP better promotes local culture by organizing small-scale cultural festivals with strict visitor limits. Furthermore, TEP's existing facilities, such as the amphitheater, can be utilized as meeting and training spaces for Jakarta's various art and cultural communities.

Regarding traditional food, TEP has yet to undertake specific efforts in its promotion. One approach that could be taken is encouraging the existing SMEs at TEP to incorporate traditional Betawi cuisine into their product offerings. Additionally, the management can organize special events that highlight traditional cuisine as an integral part of the TEP experience. Moreover, in terms of traditional clothing and local language, the management has implemented policies requiring TEP employees to use the local language and wear Betawi traditional attire during certain events, such as the celebration of Jakarta's anniversary. This proactive move represents a positive stride toward fortifying the local cultural identity within TEP. Apart from cultural attractions, cultural conservation also encompasses social and community values, customs, and religion. In the context of values, green open spaces should instill an appreciation for practices like sharing public facilities, where every individual holds the right to utilize them in various positive ways, including recreation, sports, and play.

Developing culturally based craft products plays a significant role in supporting cultural preservation and community empowerment. To achieve this goal, it is essential to encourage SMEs within the TEP vicinity to produce or provide specific iconic craft products. This strategy can begin with research or surveys to identify locally crafted products with the potential to attract visitors. Following that, collaborative partnerships with local SMEs can be formed, and exhibitions to promote these products and introduce visitors to the richness of local culture can be organized.

Education

Educational principles cover two indicators: access to information and knowledge about the flora and fauna within the area and promotion and education on conservation and sustainability concepts. TEP's administration has launched several educational activities to promote the preservation of nature and culture. These efforts often involve the installation of informative boards and the use of various media platforms. Notably, one of the ecotourism experts highlighted,

In conducting ecotourism, the pillar of education places a strong emphasis on strengthening programs for the preservation of the site. The utilization of interpretive information boards is crucial in ecotourism areas. However, the role of management as facilitators who can effectively coordinate educational programs catering to all community segments is equally crucial. (Informant 02, personal communication, 2023)

Another informant provided a more comprehensive view of education within ecotourism areas by highlighting TEP's effort in educating the community on various aspects such as the environment, social dynamics, culture, and economics. This multifaceted approach seeks to deliver actual benefits to the local community.

When it comes to providing valuable information and knowledge about the rich flora and fauna within the area, TEP has taken several commendable steps such as actively sharing detailed information about the various types of vegetation found in the park on TEP's official website. However, there are still some areas that need further improvement and attention. One key aspect is ensuring an even distribution of information boards containing profiles of the various vegetation types in the TEP area. Currently, informative boards have been thoughtfully placed near the vegetation at the north entrance. Yet, similar

Evaluation of Tebet Ecopark Management Based on Ecotourism Principles
Arum et al. (2024)

Jki

installations need to be improved in other significant locations or zones throughout the park. For example, the south entrance, which boasts a vibrant *forest buffer* zone teeming with diverse vegetation, and the charming *boardwalk* area which could greatly benefit from such informative displays.

In addition to the informative boards placed near each type of vegetation, TEP management can further enhance educational efforts by providing brochures or pamphlets about TEP. They can also maximize the educational experience by screening videos related to conservation and ecotourism. Additionally, collaborating with environmental enthusiast communities to organize public *sharing sessions* on conservation topics for the public is another effective approach.

TEP management has attempted to promote and educate visitors about conservation through their official website. The website contains specific guidelines to reduce the negative impact of visitor activities on the environment. These guidelines include suggestions for proper waste disposal, strict enforcement of a no-smoking policy within the park area, and a ban on vandalism. Furthermore, TEP has partnered with the public library (*book hive*), offering a valuable opportunity to educate visitors. This collaborative effort involves the distribution of mini bookshelves packed with a variety of books focused on environmental conservation and ecotourism topics.

Community Participation

Indicators in this principle are the involvement of the local community in decision-making and the concern and satisfaction of the local community over ecotourism. According to the management, the local community's attitude towards TEP was quite diverse. Some were caring and enthusiastic, while others were disinterested or even exhibited negative behavior by criticizing the park. The concerned group typically consisted of local community members who wanted to utilize the facilities offered at TEP.

TEP actively engages the local community in its decision-making processes. This collaborative approach involves open discussions and coordination with surrounding residents. These discussions occur in forums held at the local administrative office, with participation from authorized staff and public relations representatives from the Jakarta Provincial Park and Forest Office. Furthermore, TEP management remains open to direct input and aspirations from the community. These forums serve as a platform for reaching mutually beneficial decisions, ensuring that the community has an active role in expressing their concerns and aspirations regarding TEP and its ongoing development.

TEP actively promotes local community engagement through collaborative initiatives within the nearby neighborhoods. As a result, the revitalization efforts at TEP have sparked a sense of responsibility among residents, motivating them to participate in cleanup activities and pollution prevention actively. In response, the community shows their dedication by conscientiously following established guidelines, including refraining from walking on the grass and ensuring the proper upkeep of TEP's facilities. Furthermore, TEP management warmly welcomes direct input and aspirations from the community, including recommendations for the supervision of children's playground areas. This open and two-way communication strengthens a strong bond between TEP and its residents, enhancing the overall experience for all parties involved. Meanwhile, concerning community satisfaction with TEP, further research is still needed to understand it better.

CONCLUSION

The discussion regarding the potential of TEP as an ecotourism-based attraction emphasizes the significance of evaluating on how well the management applies ecotourism principles in the area. While it has not been officially designated as an ecotourism destination, TEP has incorporated essential principles such as environmental conservation, cultural preservation, local economic contributions, education, and local community involvement. Nevertheless, there is room for optimization in the implementation of these indicators to ensure that TEP becomes a successful urban ecotourism attraction.

Research related to ecotourism can employ various principles. Therefore, the use of different variables will yield different data. As an initial study of TEP within the framework of ecotourism, we propose several priority strategic policies that TEP managers can implement. They can closely control the quantity and timing of visits, allowing TEP and its vegetation to recover adequately after each visit. Besides, conducting scientific assessments related to TEP's carrying capacity is crucial for environmental sustainability. Furthermore, they should consider utilizing alternative energy sources within its operation to reduce reliance on PLN electricity. Moreover, utilizing more ecologically friendly materials for plant maintenance can significantly contribute to conservation efforts. Additionally, providing vegetation information boards, especially at the South entrance, can enhance visitor experiences and raise environmental awareness. Lastly, intensifying eco-friendly waste management programs is essential for minimizing the ecological footprint of TEP.

Nevertheless, this research solely examined a single city park without making comparisons to other city parks in Jakarta. Further, the research focused primarily on park management and ecotourism experts, leaving out visitors' perspectives. To achieve a more comprehensive understanding, further research should include the perspectives of visitors regarding the development of TEP as an ecotourism-based attraction.

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Arum et al. (2024)

JKi

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Evaluation of Tebet Ecopark Management Based on Ecotourism Principles
Arum et al. (2024)

Jki

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SYSTEM DYNAMICS MODELLING FOR TOURISM CARRYING CAPACITY IN SABA BUDAYA BADUY

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Article Info	Abstract
	Saba Budaya Baduy serves as a significant tourist destination contributing to the local economy of the Baduy community. However, the substantial surge in tourist arrivals poses potential long-term challenges for the local Baduy community. The issues arising from tourism activities encompass cultural shifts, environmental changes, and impacts on the local economy. This research aims to propose a sustainable visitor limitation model to ensure that elements linked to the interests of tourism business activities remain unaffected by visitor restrictions. Quantitative methods apply the Tourism Carrying Capacity (TCC) approach to determine visitor benchmarks and System Dynamics (SD) for simulating visitor limitations over ten year. Model 3, proposed as a policy, yields sustainable visitor limitation policies. The proposed measures include phased visitor limitations annually, price adjustments, agreements between managers and tour operators, and feedback agreements between managers and local businesses. Simulation results from Model 3 project that the TCC-defined visitor limitation value will be achieved by the 10th year (2030), totaling 16,406 visitors annually, compared to an Effective Carrying Capacity (ECC) of 15,612 visitors annually. These measures enhance the local socio-economic resilience through the assurance of annual income stability.

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INTRODUCTION

Tourism plays a significant role in fostering the economic growth of a country. As one of the fastest-growing industries globally, tourism has experienced various disruptions. Mass tourism emerged due to changes in socio-economic patterns in modern society resulting from the Industrial Revolution in the 18th century. The existence of a consistent wage system has led modern society to spend part of their income on traveling out of town and vacationing in places such as beaches. Mass tourism is observed based on the large number of people traveling to a destination for leisure (Butcher, 2020). The emergence of mass tourism has sparked several criticisms, including critiques regarding the perceived superiority of one culture over the culture of the destination concerns related to mass consumerism, which can lead to social and environmental inequality issues (Butcher, 2020). The criticisms have led to a counterculture known as alternative tourism, which prioritizes morality in travel. One concept within alternative tourism is cultural tourism, which is supply-oriented. This concept emphasizes the experiences gained by tourists when visiting destinations with different cultures. Thus, the tourism concept no longer follows the tide of globalization, which demands cultural uniformity (Jovicic, 2016). The concept of quality tourism is developed to ensure that tourists and the local community in tourist destinations have a positive and comfortable experience through tourism carrying capacity and conservation efforts (Haribudiman et al., 2023).

The disruption in the tourism sector has significant implications for several countries that rely on tourism as an economic driver. The emergence of the COVID-19 pandemic has restricted travel, effectively freezing this sector. According to the Organization for Economic Co-operation and Development (OECD), the tourism industry is among the hardest hit by these circumstances (Jha, 2022). The tourism sector is one of the pillars of the Indonesian economy. Data from 2016 to 2019 shows that the tourism sector contributed to the national GDP, accounting for 4.63% in 2016 and 4.97% in 2019. However, the COVID-19 pandemic had a negative impact on the Indonesian tourism sector, leading to a decline in its contribution to GDP in 2020 to 2.23% and in 2021 to 2.3% (Kemenparekraf, 2023).

To build the tourism ecosystem post-COVID-19, UNWTO, in the G20 summit 2023, suggested building the tourism economy from the most vulnerable strata, i.e., rural areas. Tourism guides the economic self-reliance of rural areas, thus enhancing the income of these vulnerable areas (UNWTO, 2023). However, the uncontrolled growth of rural tourism can also give rise to challenges and issues in achieving sustainable tourism goals (Xiang et al., 2020). Saba Budaya Baduy is one of the tourist destinations located in the Banten Province, Indonesia. This tourism destination exemplifies a rural - ecotourism destination that faces issues that need to be resolved to achieve sustainability.

The Baduy community is divided into the Inner Baduy and Outer Baduy, with the Inner Baduy adhering firmly to the cultural values and ancestral traditions, while also distancing themselves from modernization. The uniqueness of their culture and traditions make Saba Budaya Baduy an attractive tourist destination (Mutaqien et al., 2022). Mass tourism activities impact the environment and the local community, particularly in the Inner Baduy cultural heritage. In the Dimension of environment, tourist visitors leave non-biodegradable plastic waste: the higher the number of tourists, the higher the amount of plastic waste generated from tourism activities. It was identified in a study on tourism's

System Dynamics Modelling for Tourism Carrying Capacity in Saba Budaya Baduy
Yakti, et al. (2024)

Jki

ecological, social, and cultural impacts (S. I. Prasetyo et al., 2021). The presence of tourism in Saba Budaya Baduy also results in a disruption of cultural transfer to the younger generation due to the influence of modern culture brought by visitors (Rohaendi, 2023). The number of visitors to Saba Budaya Baduy in 2019, before the COVID-19 pandemic, experienced a significant increase compared to 2018. Following the pandemic in 2022, this upward trend in visitor numbers has started to occur again. The escalation of mass tourism activities leads to the largest problems if there is no management based on tourism policies (Butcher, 2020).

The increase in visitor numbers also has a positive impact on the income of the village and local businesses. The presence of tourists visiting Saba Budaya Baduy increases the village's income, and local communities earn income from various sources such as selling agricultural products, crafting Baduy's dagger, and Baduy's weaving. Additionally, the presence of visitors also provides employment opportunities for local communities, such as working as tour guides (Mutaqien et al., 2022).

The positive and negative impacts resulting from the secondary data were further analyzed through in-depth interviews with the village office. The interview results confirmed that mass tourism has brought negative and positive impacts. The negative impacts include a change of the lifestyle of the local Baduy community, which is now leaning towards the modernity brought by visitors that violates cultural regulations for visitors that disrupt traditional culture taught by previous generations to the new generation. Regulations commonly violated by visitors include chemical substances such as shampoo, soap, toothpaste, and others. This change has negative impacts on the future of the Baduy indigenous community, considering the tourism appeal offered by the Saba Budaya Baduy, which is the authentic culture possessed by the Baduy indigenous community (Waluya et al., 2022). Furthermore, these chemical substances can damage the natural ecosystem there, considering that the Baduy indigenous community still relies on water sources and rivers for daily life (Asteria et al., 2021). In 2020, the Baduy tribal leaders proposed to the central government of the Republic of Indonesia to remove Saba Budaya Baduy as a tourist destination. This was due to the disproportionate negative impacts received by the local community compared to the positive impacts resulting from mass tourism activities (Intan, 2020). Figure 1 represents the number of tourists.

Figure 1. Tourists Amount of Saba Budaya Baduy 2017 – 2023
Source: Tourism Office of Lebak Regency, 2023

On the positive side, the presence of visitors has led to increased income for the village and improved the local economy. However, the management of the economy in

Saba Budaya Baduy still faces several challenges due to lack of unity between local communities, village office as tourism manager, and travel service as tourism operator. This lack of cohesion leads to price competition in travel services, resulting in unstable income for the local community, which ultimately contributes to social disparities. The village office, which should have authority over the tourist destination, cannot set visitor quotas due to the involvement of the local Baduy community, who have interests in tourism activities. As a result, travel services sometimes disregard the number of tourists visiting. The commercialization of tourism in the Saba Budaya Baduy cultural village is not the primary concern; rather, it is about how the local community can generate income while preserving the cultural heritage in the presence of tourism. Thus, tourism can encourage the local Baduy community to maintain the sustainability of their culture. One aspect of their culture is preserving the natural environment.

Control is crucial in any proposed development discussion, especially controlling the number of visitors engaging in tourism activities (Seraphin & Ivanov, 2020).Visitor restriction through carrying capacity in tourism has been implemented using formulas implemented by Cifuentes in 1992, such as physical carrying capacity (PCC), real carrying capacity (RCC), and effective carrying capacity (ECC). Tourism carrying capacity also contributes to sustainable tourism development, which refers to three frameworks. First, the recovery of natural resources, environment, and ecosystems is needed. Second, implementing integrated planning in land use, economic growth, socio-demographic strengthening, and environmental sustainability. Third, educate tourists to change their attitudes, behaviors, and ethics (Haribudiman et al., 2023). Several studies have utilized visitor limitations to achieve sustainable tourism, including Mijiarto and Rachmawati (2022), Rasidi et al. (2023), Mota et al. (2021), Sihombing et al. (2022), by implementing visitor restrictions through Cifuentes tourism carrying capacity method, the threshold of the number of visitors can be determined, ensuring that the environment and social aspects of the tourism destination are not disrupted.

The carrying capacity in a tourism system offers the advantage of reducing the risk of overtourism. It prioritizes the planet, people, partnership, prosperity and peace. However, on the other hand, stakeholders' income as a partnership within the tourism system may be disrupted, even decreasing their earnings. In this regard, the development of a system thinking-based model is highly significant, as it can encompass several components within the system holistically. System dynamic simulation has been widely employed in designing sustainable tourism models; this approach can simulate a cause-and-effect model over a specified period (Sedarati et al., 2021). Several studies have utilized system dynamics to build sustainable tourism, as will be outlined: Susanty et al. (2020), Sjaifuddin (2020), Mustafa and Hawari (2022), Tan et al. (2018). The results of system dynamic simulations, oriented towards sustainable tourism models, are utilized by addressing the root causes of tourism issues. For example, reducing private transportation emissions, such as CO_2 (Susanty et al., 2020), limiting the number of tourists for sustainability concerns (Sjaifuddin, 2020), enhancing tourism facilities and attractions (Mustafa & Hawari, 2022), and implementing visitor management based on the area's carrying capacity (Tan et al., 2018).

Previous research on the visiting model to the cultural tourism destination of Saba Budaya Baduy has predominantly focused on qualitative concepts based on the local customs and traditions, such as the determination of visiting regulations based on

System Dynamics Modelling for Tourism Carrying Capacity in Saba Budaya Baduy
Yakti, et al. (2024)

Jki

customary regulations to ensure the sustainability of the tourism system. Several articles discussing the tourism visiting model include Waluya et al. (2022), Nugroho et al. (2024), Solikhah (2020). There is an unfilled gap in this research, particularly in technical field studies, such as the absence of determining the limit of the number of visitors allowed to visit and modeling visitor restrictions that still prioritize the local economy.

The objective of this research is to propose a tourism model for Saba Budaya Baduy to achieve sustainable tourism. Based on the above issues, the implementation of the Tourism Carrying Capacity (TCC) approach to limit tourist visitors must be carried out. The System Dynamics approach simulates visitor limitations to avoid negative impacts on elements within the tourism system. It is expected that the proposed tourism model will provide insights for implementing visitor limitation policies in Saba Budaya Baduy.

METHODOLOGY

The research was in the tourism destination of Saba Budaya Baduy, Kanekes Village, Lebak Regency, Banten Province, Indonesia, in 2023. The type of data used in this study are primary data. Primary data were obtained directly from key informants through in-depth interviews with several stakeholders who have interests in the Saba Budaya Baduy tourism system.

The primary data obtained is based on in-depth interviews with several stakeholders, including four individuals from the village apparatus, two from cultural and tourism activists of Saba Budaya Baduy, and five travel service owners who bring visitors for tourism purposes. Digital mapping or Geographic Information System used as primary data. Digital mapping determined the area of Kanekes Village, especially for Spacious, and the slope of tourism route of tourists area (Figure 2). Q GIS Software and Google Earth Pro used for this primary data collection.
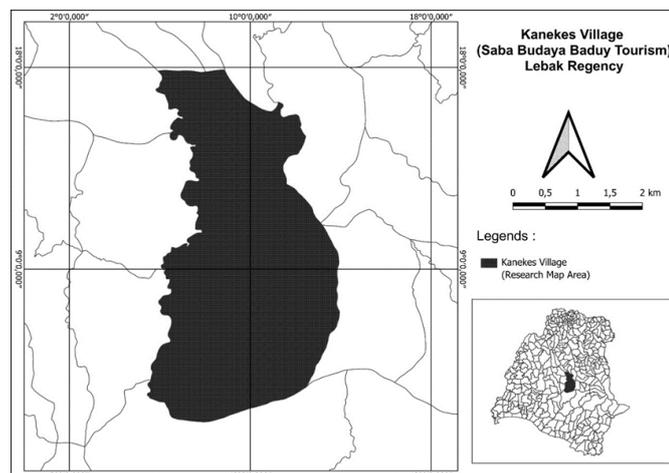
Figure 2. Research Object Map
Source: Authors' analysis, 2023

Several tourist areas have been identified based on in-depth interviews with various stakeholders as previously mentioned. There are five places where tourists gather, i.e., Kampong Balimbing, Kampong Marengo, Kampong Gajeboh, Kampong Cibeo, and Kampong Cikeusik. These locations are for resting during hiking activities and overnight

stays. Kampong Cibeo is the main priority due to its spaciousness and unique attraction, as the Baduy tribe resides here. The location of these tourist areas is in Figure 3.
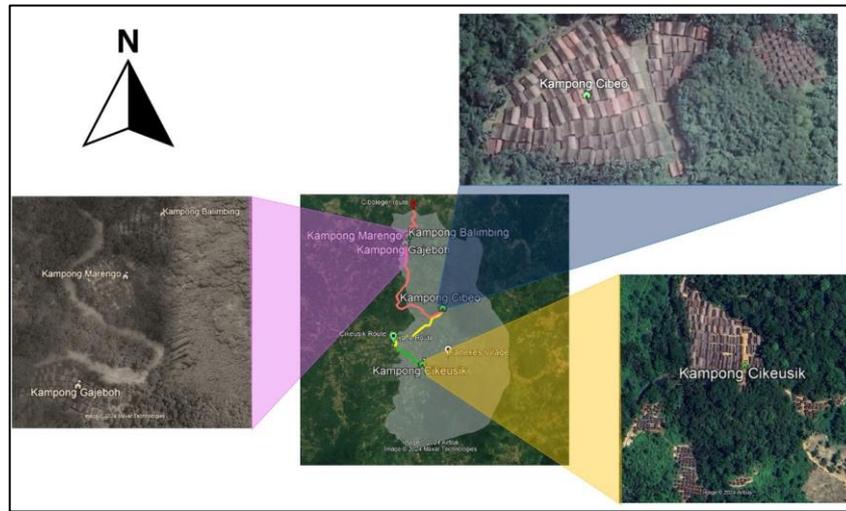
Figure 3. Tourist Area
Source: Google Earth Pro, 2023

The elements within the tourism system of Saba Budaya Baduy include: 1) the local Baduy community as owners of the tourist destination, divided into several parts, namely SMEs Local, Lodging owner, and Tourguide, 2) the village office as the tourism manager, and 3) travel services as tourism operators. The presence of a large number of visitors can significantly disrupt the lives of the local community (Butcher, 2020), and the problems that arise can also lead to an anti-tourism sentiment among the local community. This calculation is made to determine the threshold of the number of visitors or to determine the visitor quota allowed to enter Baduy. Research stages of the method used in this research are explained using a flowchart, as shown in Figure 4.
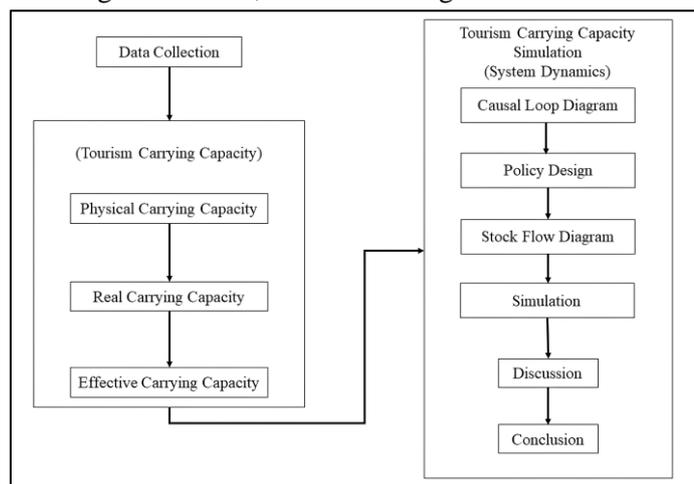
Figure 4. Research Stages
Source: Authors' analysis, 2023

Tourism Carrying Capacity

Tourism carrying capacity is a theory related to tourist destinations that influences the quality of the tourism experience. Tourism carrying capacity encompasses several

System Dynamics Modelling for Tourism Carrying Capacity in Saba Budaya Baduy
Yakti, et al. (2024)

Jki

factors, including the capacity of the destination to accommodate visitors, weather conditions, terrain characteristics, the number of tourism managers, and biodiversity within the destination (Mijiarto & Rachmawati, 2022).

On the Cifuentes method of carrying capacity, Real Carrying Capacity (RCC) refers to the actual threshold value of visitors to a tourist destination to ensure the manageable capacity of the visited place. The formula employed in this study refers to the method proposed by Cifuentes (1992) and Sihombing et al. (2022). This factor is a key determinant in tourism destinations, as excessive visitors can lead to over-tourism phenomena (Dodds & Butler, 2019). RCC comprises various determining factors, such as physical carrying capacity (PCC), which represents the physical limits of visitor numbers in a given location, and other factors like rainfall, slope or steepness of the tourism routes leading to the attractions. The value of RCC can be determined using the following formula based on Cifuentes (1992):

$$RCC = PCC \ x \ Cf1 \ x \ Cf2 \ x \ .... Cf \qquad ...(1)$$

Cf1, Cf2, and Cfn represent the other factors previously explained. The value of PCC used the following formula:

$$PCC = A \ x \ 1/B \ x \ Rf \qquad ...(2)$$

A = Tourist area
B = Coefficient
Rf = Tourist rotation factor

The value of B is determined as $65m^2$ based on Fandeli (2000) from Douglas and Isherwood (1979), and it represents the recommended distance between visitors (Sihombing et al., 2022). It is the coefficient. Meanwhile, Rf is the operating hours of the tourist site divided by the duration of visitor's stay, with Rf measured in hours.

Rf = The duration of operation of the tourism/The duration of tourism activity *...(3)*

Several supporting factors are needed to determine the value of RCC. In this study, the supporting factors used are the value of rainfall (Cf1) and the slope of the tourism route (Cf2). The value of Cf1 is obtained through the following formula based on Cifuentes (1992):

$$Cfn = 1 - \frac{Mn}{Mt} \qquad ...(4)$$

Cfn is the supporting factors, Mn is the limiting magnitude of supporting factor, and Mt is the total magnitude of supporting factor. This research uses two of supporting factors, namely rainfall and average of slopes.

ECC represents the optimal management carrying capacity to accommodate tourists based on management considerations. We must know the Management Carrying Capacity (MC) to determine ECC. MC refers to the number of tourism management

personnel, including village officials and the staff required for the model. MC is determined using the following formula based on Cifuentes (1992):

$$MC = Rn/Rt \ x \ 100\% \qquad \qquad ...(5)$$

Rn represents the total number of tourism management personnel, and Rt represents the required number of personnel. The formula for ECC is based on Cifuentes (1992).

$$ECC = RCC \ x \ MC \qquad \qquad ...(6)$$

System Dynamics

System Dynamics is a methodology based on feedback or control theory that can address complex and dynamic problems (Hahn, 2019). System dynamic was initially created to design and simulate complex and dynamic cause-and-effect events based on time series. This approach is used to experiment with tourism management policy models (Baggio & Baggio, 2020).

The use of system dynamics in the tourism industry applies to security issues and the impact of visitors on the surrounding environment (Sedarati et al., 2019). The system dynamics framework commonly used in tourism systems is based on balancing systems or feedback.

System Dynamics has three stages. The first stage involves qualitatively analyzing the cause-and-effect relationships of each variable within the model, known as the causal loop diagram (CLD). The second stage involves formulating the model based on the cause-and-effect relationships identified in the CLD, known as the stock flow diagram (SFD) (Sedarati et al., 2021). This System Dynamics are through Vensim PLE 5.1. Software.

FINDINGS AND DISCUSSION

Determining Tourism Carrying Capacity

The data required to calculate PCC was obtained, and the number of visitors according to the PCC calculation is described in Table 1.

Table 1. Physical Carrying Capacity

Place	A (ha)	B (ha)	Rf (hours)	PCC (person/ day)
Cibeo	1.45	0.0065	0.8	178
Balimbing	0.84	0.0065	0.8	145
Marengo	1.46	0.0065	0.8	103
Gajeboh	1.18	0.0065	0.8	180
Cikeusik	1.15	0.0065	0.8	142
Total				748

Source: Authors' analysis, 2023

The area of tourist (A) is obtained from digital mapping or GIS by plotting polygon points to form an area for use in PCC calculations. B is a coefficient determined to ensure that tourists obtain a satisfying experience (Fandeli, 2000). Meanwhile, the value of Rf is from the opening hours of the tourist destination or the duration of the visit, the data

System Dynamics Modelling for Tourism Carrying Capacity in Saba Budaya Baduy
Yakti, et al. (2024)

JKi

obtained from village administrative and travel service. According to the administrative village of Baduy, it is open 12 hours a day from 06.00 AM until 06.00 PM. The usual time used for tourism activities according to the travel service is 15 hours, for staying at lodging from 05.00 PM until 08.00 AM. The Rf value is the result of 12 hours operating divided by 15 hours duration of visitors.

$$Q = \frac{\Sigma\ dry\ months}{\Sigma\ wet\ months} \qquad \qquad ...(7)$$

$$rainfall\ (Cf1) = 1 - \frac{Q}{7} \qquad \qquad ...(8)$$

Q represents as limiting magnitude of rainfall factor (Mn), the formula based on Lakitan (2002). The value of 7 is the total magnitude (Mt) or represents the highest *Schmidt-Fergusson index* based on Lakitan (2002). Since the location of Saba Budaya Baduy is in Region 2 according to the Meteorology, Climatology, and Geophysics Agency (BMKG), the rainfall data used on the monitoring of weather stations in Region 2, specifically the rainfall data from 2018 to 2021 at the Kemayoran Jakarta station. From this data, the number of wet months from 2018 to 2021 was 32 months, while the number of dry months was sixteen months. Table 2 represents result of rainfall.

Table 2. Cf1 Rainfall

Number of wet months (2018 – 2021)	Number of dry months (2018 – 2021)	Highest Schmidt – Ferguson index as Mt	Cf1
32	16	7	0.9285

Source: Authors' analysis, 2023

The values for the number of wet and dry months from the data provided by the BMKG (Meteorology, Climatology, and Geophysics Agency) for Region II, specifically from the Kemayoran Station (BMKG, 2022). Region II was chosen because the Regency of Lebak falls within its coverage area according to the BMKG.

The average slope will be determined based on digital data using the Google Earth application, which allows for the calculation of the average slope between different points (routes) within the tourist destination. The value of the average slope will be classified based on the slope classification system provided by the Ministry of Agriculture in their guidelines, Decree of Minister of Agriculture Number 837/KPTS/UM/11/1998 (Putri et al., 2022). The formula used to determine Cf2 is as follows based on Cifuentes (1992) :

$$Cf2 = 1 - \frac{Clasification\ value\ of\ the\ average\ slope}{100} \qquad \qquad ...(9)$$

Classification value of the average slope represents as limiting magnitude of supporting factor (Mn). The value of 100 is the total magnitude of supporting factor (Mt) or the highest value slope classification based on the Decree of Minister of Agriculture Number 837/KPTS/UM/11/1998. This formula determines the value of Cf2 based on the slope of the tourist site. The slope is calculated based on two tourist paths and two entrances in Saba Budaya Baduy. The result is in Table 3.

Table 3. Cf2 (slope of tourism route)

Average Slope (%)	Value	Cf2
7.5 - 15	40	0.6

Source: Authors' analysis, 2023

The average slope is from digital mapping data or spatial GIS data. The results of the real carrying capacity values are in Table 4.

Table 4. Number of visitors in Real Carrying Capacity

Cf1	Cf2	PCC (person/day)	RCC total (person/day)
0.9285	0.6	748	±417
RCC total (Person/Year)			**±21,684**

Source: Authors' analysis, 2023

RCC total (person/day) calculated based on trip activity from travel service once a week. So, RCC total (people/year) calculated as RCC total (person/day) multiplied by the number of weeks/year (417*52).

Primary data was from an interview with the village administration regarding the tourism managers. *Rn* total is 26, including all village officials. During the interview, the village authorities planned to increase the number of tourism managers from each village to serve as tour guides and cleanliness agents, so *Rt* total is 36. The values of MC and ECC are in Table 5.

Table 5. Number of visitors in Effective Carrying Capacity

Rn	Rt	MC	RCC total (people / year)	ECC total (People / year)
26	36	0.72	**±21,684**	**±15,612**

Source: Authors' analysis, 2023

System Dynamics Model
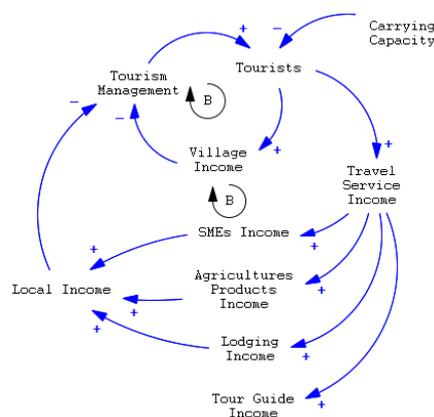
Figure 5. Causal Loop Diagram
Source: Authors' analysis, 2023

The causal loop diagram (CLD) in Figure 5 explains the proposed policy model. The presence of tourists can have a positive impact on village income. The presence of carrying capacity aims to limit the number of visitors by controlling the travel service, so that the natural environment and the lives of the Kanekes Village community are not overly disrupted by excessively massive tourism.

System Dynamics Modelling for Tourism Carrying Capacity in Saba Budaya Baduy
Yakti, et al. (2024)

Jki

The positive impact of tourist visits on village income can be utilized as a closed-loop system, where feedback occurs through tourism management, enabling it to attract tourists to continue visiting. This tourism management will also have a positive impact on travel service income. Here, through village policies and other influential stakeholders, regulations can be established for travel services. Travel services must adhere to carrying capacity policies, standardize tour trip prices, and bundle their tour packages with local residents who have businesses in tourism, ensuring that local income is well provided for. Village policies will also target businesses developed by local residents, requiring them to allocate part of their earnings for Tourism Management purposes. The concept of sustainable tourism can be achieved when this model is consistently implemented by the Village authorities.

To understand the implementation flow of the model depicted in the CLD in Figure 5, a Stock Flow Diagram (SFD) is created. It allows for a clear breakdown of the cause-and-effect flow and enables the simulation of the proposed sustainable tourism model. This proposal is explained gradually through several models over the next ten years from 2023, named Model 1, Model 2, and Model 3. However, before explaining these stages, it is necessary to create a simulation of the tourism system subject to Carrying Capacity treatment based on the ECC value.
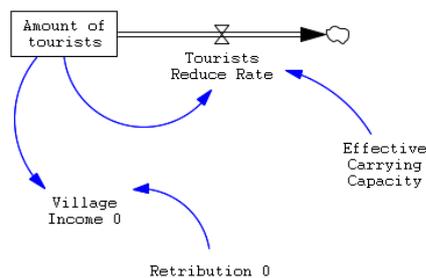
The SFD in Figure 6 explains the simulation of the tourism system subjected to Carrying Capacity treatment with the ECC value.

Figure 6. SFD Carrying Capacity Treatment
Source: Authors' analysis, 2023

Table 6. Information related to SFD Carrying Capacity Treatment

Components	Values | Unit	Equation	Information
Number of tourists (Level)	Initial: 54,421 | People	-(negative) tourist reduce rate	Initial tourists number in 2023. Stock
Tourists reduce rate (Auxiliary)	- | People/Year	Number of tourists*Effective Carrying Capacity	Flow
Effective Carrying Capacity (Constant)	0.713 | /Year	-	Percentage decrease from initial number of tourists in 2023 to ECC Value
Village Income (Supplementary)	- IDR	Number of tourists*Retribution	
Retribution	IDR 5,000/People	-	Baduy Village Retributions

Source: Authors' analysis, 2023

The implementation of Carrying Capacity with an ECC value has a negative impact on the number of tourists, consequently affecting village income negatively as well (Table 6). It can lead to a drastic decline in the income from visiting tourists. If the model only proposes Carrying Capacity treatment alone, it is not sustainable, especially in strengthening the local community's economy.

Carrying capacity treatment in the Baduy tourism system is enhanced through Model 1. This model simulates the implementation of village budgeting aimed at attracting visitors through tourism management, increasing the number of visitors. According to in-depth interviews with village authorities, they agreed to allocate 30% of the income from tourist visits for management purposes. The SFD Model 1 is in Figure 7.
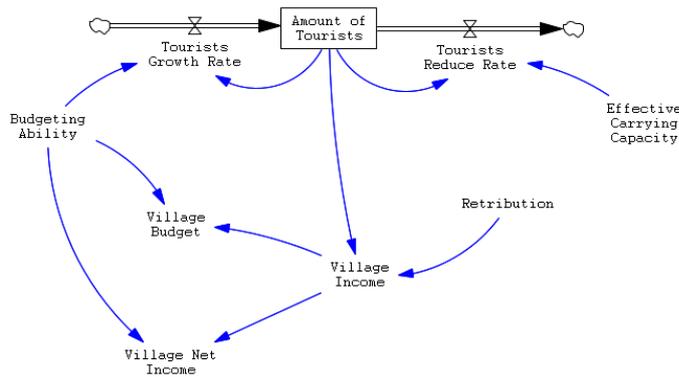
Figure 7. SFD Model 1 and 2
Source: Authors' analysis

Table 7. Information related to SFD Model 1

Components	Values | Unit	Equation	Information
Number of tourists (Level)	Initial: 54,421 | People	-(negative) tourist reduce rate	Initial tourists number in 2023. Stock
Tourists' growth rate (Auxiliary)	- | People/Year	Budgeting ability*ability*Number of Tourists	Flow
Tourists reduce rate (Auxiliary)	- | People/Year	Amount of tourists*Effective Carrying Capacity	Flow
Effective Carrying Capacity (Constant)	0.713 | /Year	-	Percentage decrease from initial number of tourists in 2023 to ECC Value
Village Income (Supplementary)	- | IDR	Amount of tourist*Retribution	
Retribution	- 5,000 | IDR/People (Model 1). - IDR 10,000/People (Model 2)	-	Baduy Village Retribution
Village budget (Supplementary)	'- | IDR/Year	Village income*Budgeting ability	
Budgeting ability (Constant)	0.3 | / Year	-	
Village net income (Supplementary)	'- | IDR/Year	Village income*(1-Budgeting ability)	

Source: Authors' analysis, 2023

System Dynamics Modelling for Tourism Carrying Capacity in Saba Budaya Baduy
Yakti, et al. (2024)

JKi

From the SFD Model 1 above, village budgeting alone still cannot increase village income, so an improvement in the designed model is needed. Model 2, designed after the Model 1 stage, has the same SFD, but the fee for entering Baduy tourism increased from IDR 5,000 to IDR 10,000. The implementation of Model 2 can increase village income. Models 1 and 2 have higher values of number of tourists and village income compared to models that only apply carrying capacity treatment (Table 7). Model 3 is an improvement from Models 1 and 2. In Model 3, travel service providers are in the modeling system to make Model 3 more holistic. The SFD Model 3 is in Figure 8.
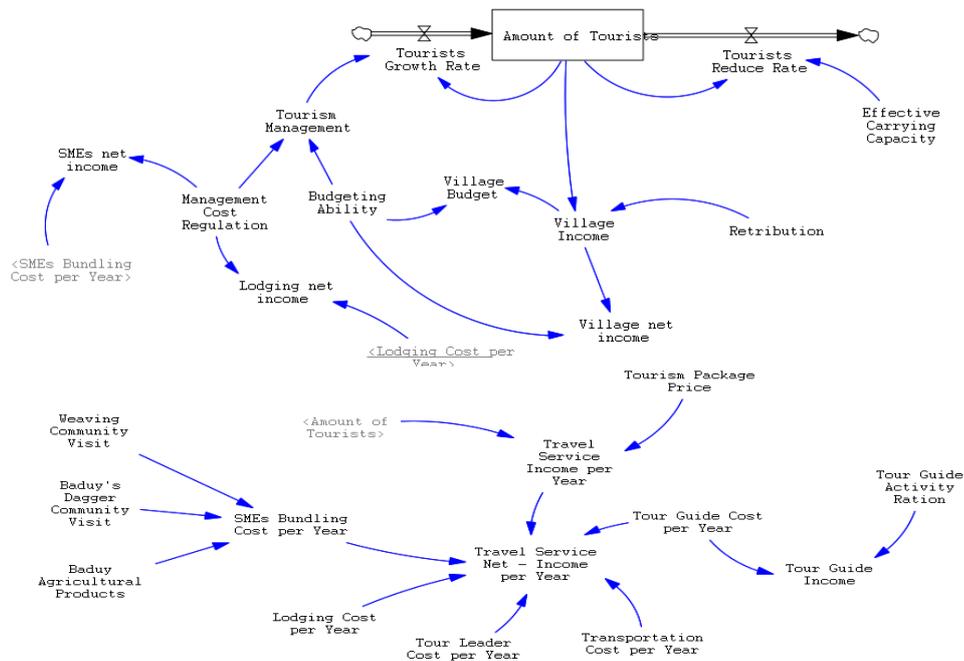
Figure 8. SFD Model 3
Source: Authors' analysis, 2023

Table 8. Information related to SFD Model 3

Components	Values | Unit	Equation	Information
Number of tourists (Level)	Initial: 54,421 | People	Tourists' growth rate - tourist reduce rate	Initial tourists amount in 2023. Stock
Tourists' growth rate (Auxiliary)	- | People/Year	Tourism Management*Number of Tourists	Flow
Tourists reduce rate (Auxiliary)	- | People/Year	Number of tourists*Effective Carrying Capacity	Flow
Effective Carrying Capacity (Constant)	0.713 | / Year	-	Percentage decrease from initial number of tourists in 2023 to ECC Value
Village Income (Supplementary)	- | IDR	Amount of tourist*Retribution	
Retribution	10,000 | IDR/People	-	Baduy Village Retribution

Components	Values | Unit	Equation	Information
Village budget (Supplementary)	- | IDR/ Year	Village income*Budgeting ability	
Budgeting ability (Constant)	0.3 | / Year	-	
Village net income (Supplementary)	- | IDR / Year	Village income*(1-Budgeting ability)	
Travel service income per year (Supplementary)	- | IDR	Amount of tourists*Tourism package price	
Tourism package price (Constant)	300,000 | IDR/People	-	Price from policy (Asumption)
Travel service net income per year (Supplementary)	-| / IDR	(Travel Service Income per Year - Lodging Cost per Year - Tour Guide Cost per Year - Tour Leader Cost per Year - Transportation Cost per Year - SMEs Bundling Cost per Year) /5	Travel service net income per year (Suplementary)
Lodging Cost per Year (Constant)	20,800,000 | IDR	-	Price from policy (Assumption)
Tour Guide Cost per Year (Constant)	62,400,000 | IDR	-	Price from policy (Assumption)
Tour guide activity ration (Constant)	26.4 | /Year	-	Ration of each tour guide group per year
Tour guide income (Supplementary)		Tour Guide Cost per Year* Tour guide activity ration	Tour guide net income per group
Tour Leader Cost per Year (Constant)	26,000,000 | IDR	-	Travel service employee costs
Transportation Cost per Year (Constant)	65,000,000 | IDR	-	Price
SMEs Bundling Cost per Year (Supplementary)	- | IDR	(Weaving community visit + Baduy's dagger community visit + Baduy's agriculturals product) *52	Bundling regulation from village to travel service. 52 is number of each week in year
Weaving community visit (Constant)	300,000 | IDR	-	Price
Baduy's dagger community visit (Constant)	300,000 | IDR	-	Price
Baduy's agricultural product	300,000 | IDR		Price
Lodging net income (Supplementary)	- | IDR	Lodging Cost per Year* Management cost regulation	Price
SMEs net income (Supplementary)	- | IDR	SMEs Bundling Cost per Year* Management cost regulation	
Management cost regulation	0.3 | / Year	-	Assumption
Tourism management	| / Year	Management cost regulation+ Budgeting ability	

Source: Authors' analysis, 2023

System Dynamics Modelling for Tourism Carrying Capacity in Saba Budaya Baduy
Yakti, et al. (2024)

Jki

In Model 3, several regulations that must be consistently implemented by the village towards travel services and local businesses (Table 8). The regulations are as follows:

1. Travel services are required to set the price of tour packages as determined by the village, which is IDR 300,000 per person.
2. Travel services must include local SMEs and local accommodations in every tourism activity at the predetermined price.
3. Travel services must include local tour guides in every tourism activity at the predetermined price.
4. Local businesses must be part of an SME community under the village's umbrella.
5. The SME community must allocate 30% of its annual income for tourism management purposes.

The above regulations can be implemented if there is an agreement between travel services as tourism operators and the village authorities as tourism managers (Figure 9). Therefore, it is proposed that the village authorities only accept travel services from official travel agencies that have been approved or licensed by the responsible authority for tourism in Lebak Regency. In this case, the Tourism Office of Lebak Regency is from preference of Baduy's authorities. The main key to these regulations is social capital, which fosters mutual trust.
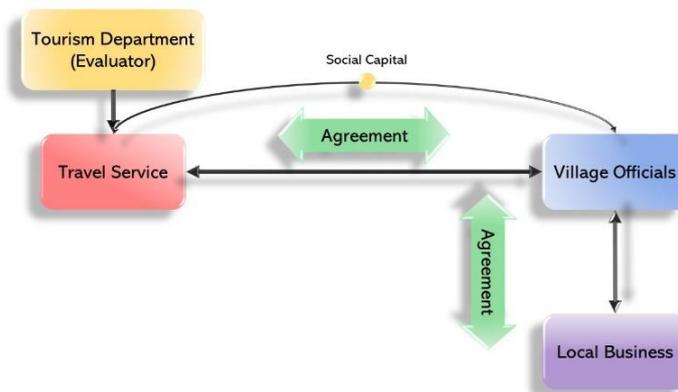
Figure 9. Model 3 Regulation
Source: Authors' analysis, 2023

Simulation Result

The results from Model 3 can minimize the significant decrease in village net income compared to models that only apply carrying capacity treatment. The decrease in village net income correlates directly with the decrease in the number of tourists, which is desired to resolve the issues in the tourism system of Saba Budaya Baduy Village. Based on the previously calculated ECC value, the annual number of tourist visits is 15,612 per year, which can be achieved by 2033. In the simulation of Model 3, the annual number of tourist visits is 16,406 per year.

The policies in Model 3 provide benefits for local income and travel services, as these policies ensure income certainty for both parties, thus avoiding trade wars that could harm the tourism system of Saba Budaya Baduy. Additionally, travel service income

experienced an increase because the average travel service rate was IDR200,000 per person previously. The overall results of the model are explained through Figure 10 to Figure 12 and Table 9.
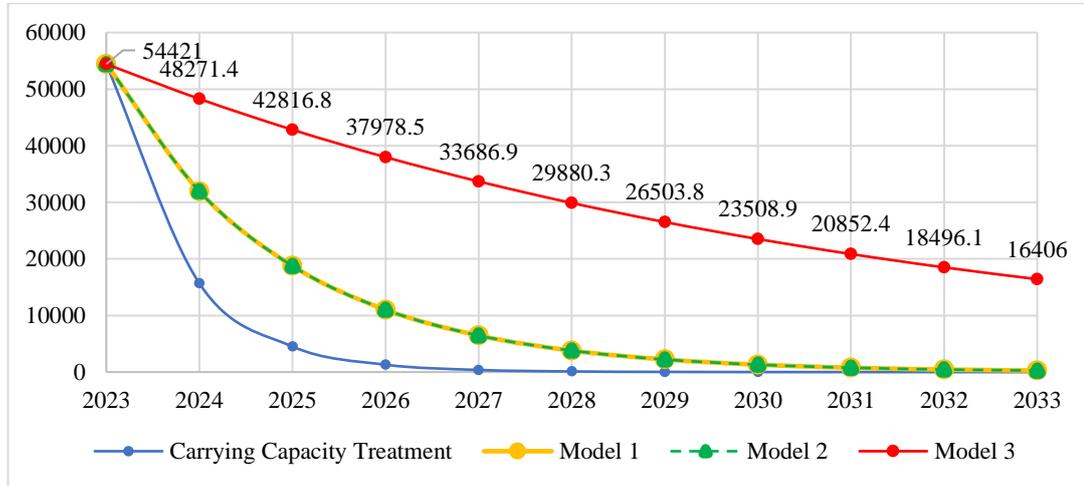
Figure 10. Number of tourists
Source: Authors' analysis, 2023
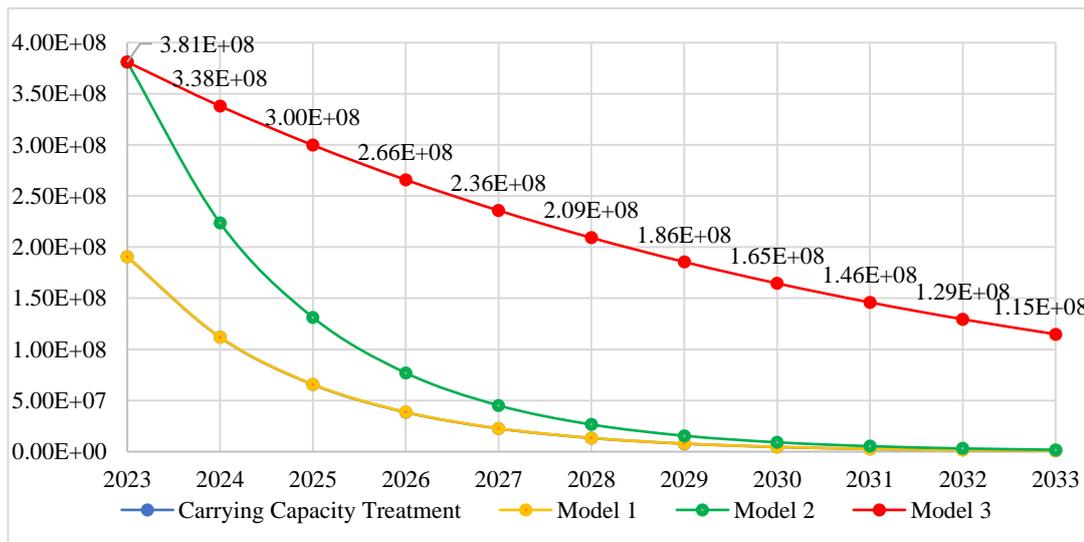
Figure 11. Village income
Source: Authors' analysis, 2023

System Dynamics Modelling for Tourism Carrying Capacity in Saba Budaya Baduy
Yakti, et al. (2024)

Jki

Figure 12. Travel Service Income with Model 3 implemented
Source: Authors' analysis, 2023

Table 9. Others elements result in 10-year simulation with Model 3 implemented

Components	Result
SMEs net income	IDR 32,760,000/Year
Lodging net income	IDR 14,560,000/Year
Tour Guide Income / Group (4 people 1 group)	IDR 31,680,000/Year

Source: Authors' analysis, 2023

Discussion

Visitor limitations at the Saba Budaya Baduy tourist destination were previously based solely on local wisdom or the ancestral traditions practiced by the Baduy community. This ancestral tradition, known as *Kawalu*, is conducted over three months and involves traditional ceremonies, environmental clean-up activities, and fasting for one day each month for the three months. During this time, no activities are permitted in the Kanekes Village area inhabited by the Baduy community, including visits by tourists from outside the village (Waluya et al., 2022). The existence of visitor limitations based on local wisdom is not sufficient to minimize the massive number of tourist visits. It is observed based on the tourist visit data from year to year, which increases drastically. There has been no attempt to impose a visitor limitation by controlling travel services.

The determination of visitor limitations in Model 3 is carried out gradually, allowing the elements associated with the system to adapt to the new policies. It is in line with the theory of tourism systems, which entails complexity and wicked problems (Baggio & Baggio, 2020). The Tourism Carrying Capacity (TCC) utilized in this study, based on the method by Cifuentes (1992), produces the value of PCC. This value is influenced by coefficient B, which ensures tourists achieve a satisfactory experience with a value of 65m^2 (Fandeli, 2000). The value of B may vary depending on preferences, where a higher B value leads to a smaller PCC value (Zacarias et al., 2011). This PCC value will affect the RCC value and subsequently impact the ECC value. In Model 3, by the 10th year (2033), the value of tourist visits is determined to be 16,406 per year, which closely approximates the calculated ECC value of 15,612 per year. Although the value of tourist visits in Model 3 in 2033 is still higher than the set ECC value, this is not an issue, considering that the ECC value is not an absolute requirement. The ECC value serves as a reference for efforts to limit the number of tourist visitors, ensuring comfort for tourism at the destination

Jki

(Sihombing et al., 2022). The goal of tourism carrying capacity at the Baduy destination is to determine the quota value of visitors as a reference for tourism management regarding travel services bringing tourists by controlling the travel service. It aligns with the tourism issues at the destination, where many travel services disregard the number of tourists they take and do not adhere to the customary regulations implemented by the local residents (Mutaqien et al., 2022).

Furthermore, determining the value of tourism carrying capacity must also be determined by decision-making approaches, which require large and interrelated variables that influence other dependent variables. Additionally, this requires identification by an expert who can estimate sensitivity analysis (Pásková et al., 2021). The limitation of variables significantly affects the assessment of tourism carrying capacity. These variables in the tourism carrying capacity method developed by Cifuentes fall into the category of correction factors. Many other correction factors cannot be fulfilled due to limited data, such as the number of endemic flora and fauna and their conditions, which affect tourist attractions (Sihombing et al., 2022).

The developed Model 3 possesses the characteristics of a closed-loop control system. According to sustainable tourism theory, good tourism is one that provides feedback to the elements within the tourism system. These elements, in this context, refer to stakeholders who have interests in tourism activities, allowing tourism to continue running and fulfilling these interests, considering that tourism falls into the category of complex businesses (Baggio & Baggio, 2020). If only viewed from one perspective, such as reducing visitor numbers to achieve environmental sustainability, other aspects, such as strengthening the local population through economic independence, will not be achieved. There needs to be a balance between the three main factors of sustainable tourism: nature environment, socio-cultural, and social strengthening with economic independence (UNWTO, 2023). An approach through system thinking, based on cause-effect relationships among variables, enables ecotourism to transform into profitable business practices that motivate stakeholders to practice ecotourism at a higher level while maintaining the integrity of the natural environment. In this case, the high number of tourist visits can cause environmental stress, hence the need for limiting tourist arrivals and raising prices (Roxas et al., 2020). In the simulation of Model 3, limiting tourist arrivals is gradually implemented to avoid negative effects that could decrease tourists' interest in visiting.

The strengthening of the local community in Model 3 is through income certainty from the regulations proposed in Model 3, such as travel services bundling their tour packages with local SMEs products and local agricultural products, utilizing local tour guides, and paying for accommodations provided by local residents at predetermined prices. With the local income generated from tourism, Model 3 suggests feedback from the local residents to tourism management through the variable of Management Cost Regulation. This feedback is not only provided by the local residents but also by the village officials as tourism managers. The officials are required to contribute materially through budget allocation for tourism management. This feedback refers to the fiscal policy standards set by the IMF in each country for tax collection, where the IMF's policy standard for tax collection is 15% of the total GDP (International Monetary Fund, 2023).

The research related to feedback from tourism budgeting is the study titled "Empowerment Model for Sustainable Tourism Village in an Emerging Country," where

System Dynamics Modelling for Tourism Carrying Capacity in Saba Budaya Baduy
Yakti, et al. (2024)

Jki

the income generated from rural tourism is allocated as a budget for tourism management (Purnomo et al., 2020). The feedback in this research fulfills the needs of tourism management, which will have a positive impact on local income through increased tourist visits. It is highly influential because good tourism management will determine the level of visits, supported by the four-structure theory in tourism industrial management practices (4A), where three of the four levels named attraction, ancillary, and amenities heavily rely on tourism management that requires funding from the destination itself to manage it (Lee, 2015).

The regulations in Model 3 concerning the agreement between travel services as tourism operators and the village as tourism managers have also been applied in several case studies involving indigenous people. The study titled "Indigenous Knowledge in Marine Ecotourism Development: The Case of Sasi Laut, Misool, Indonesia" found that agreements built between tour operators and local residents, as well as the businesses developed by tour operators respecting the cultural values of the local population, can integrate with the protection of marine biodiversity in the area. The practices that preserve marine biodiversity can become tourist attractions, enabling local residents to earn income and even develop livelihoods in the tourism sector (N. Prasetyo et al., 2020). In the study "Indigenous Legacy for Building Resilience: A Case Study of Taiwanese Mountain River Ecotourism", social capital plays a crucial role for indigenous people in building resilience against threats to their territories as tourist destinations. In other words, it serves as their primary source of economy and livelihood. The social capital developed in Taiwanese mountain river ecotourism involves individuals trusted by the local indigenous community to develop ecotourism, particularly those who understand local knowledge or indigenous customs and culture (Shie, 2020). The social capital. The application of social capital in Baduy is similar to the two cases described in the articles above. The essence of implementing this is to prioritize the cultural life of the Baduy tribe itself, meaning that tourism development is based on the preferences of the local Baduy community, especially in terms of cultures and customs, so that ecotourism can be achieved based on indigenous customs and culture of the indigenous people of Baduy.

CONCLUSION

Model 3, as the proposed policy, gradually minimizes tourist arrivals while simultaneously strengthening the local economy. The practical implication of proposed policy includes the implementation of a gradual annual visitor limit from controlling travel service, increasing tourism levies, the village as tourism managers establishing agreements with travel services as tourism operators, the village forming agreements with local SMEs, lodging owners and tour guides, and providing feedback on tourism management from tourism business activities. The result of system dynamics simulation conducted over ten years on Model 3 show that the target number of visitors can be achieved by the 10th year, reaching a visitor limit of 16,406 people per year. The projected income of related elements includes village income of IDR 115,000,000 per year, travel service income of IDR 940,160,000 per year, local SMEs' income of IDR 32,760,000 per year, lodging income of IDR 14,560,000 per year, and tour guide income of IDR 31,680,000 per year. The managerial implications of this study lie in enhancing the sustainability of the Saba Budaya Baduy tourist destination. Implementing visitor limitations can mitigate the erosion of local

culture to preserve the natural environment, which is often influenced by the pervasive aspects of modern culture brought by visitors, such as the use of chemicals for cleaning purposes and the consumption of snacks packaged in plastic, which contributes to plastic waste. Moreover, local income experiences growth and stability due to standardized pricing resulting from agreements between the village as tourism managers and travel services as tourism operators.

Limiting visitor numbers through tourism carrying capacity in the Saba Budaya Baduy tourist destination is essential, given the significant surge in visitor numbers in 2023 and the need for immediate action. This research is still in its initial stages to determine the balance between the number of visitors and the income generated from tourism activities in the Saba Budaya Baduy tourist destination. Further research is expected to examine the perspectives of tourists on the increase in tourism levies for daily socio-cultural life preservation of Baduy and natural biodiversity resource protection, as well as to investigate cultural carrying capacity and other variables influenced by the number of tourist visits.

ACKNOWLEDGEMENT

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ECONOMIC VALUATION OF THE KLAPANUNGGAL KARST REGION USING THE TRAVEL COST METHOD

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Article Info	Abstract
	Indonesia has Karst areas spread throughout almost the entire archipelago. The Klapanunggal Karst region has been officially designated as a Karst Landscape Area, to emphasize its protected status, in alignment with governmental endeavors aimed at ensuring the long-term preservation of the ecological and human-related significance of this karst ecosystem. The aim of this research is to perform an economic valuation of the Klapanunggal Karst region using the Travel Cost Method. The research conducted intensive field observations within the Klapanunggal Karst area and administered well-structured questionnaires to a sample size of 109 respondents from visitor Klapanunggal Karst region. Base on observations and field data, the Klapanunggal Karst region was partitioned into four distinctive zones. Zone 1 is location within an industrial limestone mining permit area, thus vulnerable to the imminent threat of industrial mining activities. Zone 2 is situated within the precincts of the Klapanunggal KBAK. Zone 3 has been transformed from a former mining site into a tourist destination. Lastly, Zone 4 has earned the coveted status of a tourist village. Subsequently, based on the economic valuation calculations, the Klapanunggal Karst region was found to have an annual economic value of Rp. 4,156,219,112.40, with a visitation rate of 0.006% of the total tourists visiting Bogor Regency. The researchers also recommend the development of tourism in the Klapanunggal Karst region as a means of enhancing the local economy, as well as ensuring the protection and sustainability of the Klapanunggal Karst area, including other critical aspects like water resources and ecosystem values.

INTRODUCTION

Indonesia is an archipelagic country that has a karst area stretching from the east to the west. The Indonesian government determines karst landscape areas based on the regulation of the Minister of Energy and Mineral Resources of the Republic of Indonesia Number 17 of 2012. This determination aims to protect karst areas and limit the exploitation of karst areas as raw materials for the cement industry. One of the Karst landscape areas adjacent to the cement industrial area is KBAK Bogor. The Bogor Karst Landscape area consists of the Klapanunggal zone, Ciampea zone, and Cigudeg zone. The Klapanunggal Karst region is part of the Karst Natural Landscape Area in Bogor, Indonesia. Administratively, it falls under the Klapanunggal sub-district within Bogor Regency. This area is home to the largest cement industry in Indonesia. Currently, the Klapanunggal Karst region is designated as a protected zone, as per the decision of the Ministry of Energy and Mineral Resources, Number 24.K/40/MEM/2020.

This protection policy has encouraged the cement industry operating in the karst region to engage in conservation efforts and adopt sustainable cement production practices. Moreover, the Klapanunggal Karst region is a sought-after destination for special interest tourism activities such as rock climbing and caving activities. Additionally, the Klapanunggal Karst area serves as a location for scientific research. One notable cave, Gua Cikarae, is famous for being the habitat of Stenasellus javanicus, a stygobiotic isopod that was initially discovered within the cave (Kurniawan et al., 2023).

Karst regions hold substantial potential for ecosystem sustainability. Karst is defined as postgenetic when karstification occurs after rock formation, whereas it is considered syngenetic when it happens concurrently (Veress, 2020). According to the Minister of Energy and Mineral Resources Regulation No. 17 of 2012 concerning the Designation of Karst Natural Landscape Areas (KBAK), karst natural landscapes are defined as landforms resulting from the dissolution of limestone and/or dolomite rocks. Karst Natural Landscape Areas exhibit specific exokarst and endokarst forms. These areas are of vital importance for both human livelihood and environmental (Y. Li et al., 2022). Karst regions serve as reservoirs for water sources and provide other ecosystem services beneficial to the surrounding communities. Karst regions are characterized by porous limestone rocks that facilitate the absorption of surface water into the ground, as the bare soil lacks vegetation (Soedwiwahjono & Pamardhi-Utomo, 2020). Karst regions are distributed globally, covering approximately 15% of the Earth's surface, and they supply drinking water to more than 20% of the world's population (S.-L. Li et al., 2021).

Karst regions are characterized by unique geological features, including soluble carbonate rock formations, elongated soil development, discontinuous thin soil layers, and a rapid-response hydrological system (Zhou et al., 2022). These areas offer numerous benefits to human life. Currently, karst regions are extensively utilized for mineral extraction, hydrocarbon resources, and construction materials. However, beyond these utilitarian functions, karst regions hold another significant value as natural heritage, which necessitates precise conservation measures to serve as a foundation for sustainable tourism development that can provide both social and economic benefits (Ruban, 2018). This perspective is championed by The United Nations Educational, Scientific and Cultural Organization (UNESCO), which spearheads the conservation of geological heritage for tourism. One of the karst areas in Indonesia selected by UNESCO for conservation and development is the Sangkulirang-Mangkulihat Karst region in East Kalimantan Province.

Economic Valuation of the Klapanunggal Karst Region Using the Travel Cost Method
Jamaludin et al. (2024)

Jki

This particular area is being developed based on its rich biodiversity and the unique natural geological heritage it possesses (Sunkar et al., 2022).

The existence of karst regions is currently threatened by the increasing global population growth. World population growth is projected to rise by 22% by 2050, from 7.6 billion to 9.7 billion people (Petroche & Ramirez, 2022). This population increase is driving the demand for housing, leading to a surge in the use of cement as a building material. Cement is a vital raw material for concrete production, the second most widely consumed material globally (Winter et al., 2022). The cement industry relies heavily on limestone as its primary raw material. However, the cement industry is responsible for significant energy consumption and raw material usage in the production of clinker (de Siqueira & Cordeiro, 2022). The excessive consumption of limestone as a raw material detrimentally impacts the degradation of karst ecosystems.

On the contrary, the preservation of karst regions is viewed as a natural resource with the potential to sustain a robust economy. The world's ecosystems provide life support to humans, including protection from natural hazards and the impacts of climate change (Caranza & Calderon, 2022). Karst ecosystems are no exception, as they, which offer benefits to human life in the form of a water source and various other ecosystem services, contributing to long-term economic development through tourism. Karst landscapes hold ecotourism potential due to their cave systems and unique forest cover that can be explored and enjoyed. They are also among the ecosystems experiencing extreme pressures from over exploitation (Caranza & Calderon, 2022).

The Ecosystem Service Value (ESV) represents the monetary embodiment of services provided by natural ecosystems and is considered a valuable indicator for assessing regional sustainable development (Jiao et al., 2022). In another definition, ecosystem service value is an approach to measure and assign economic value to ecosystem goods and services, along with their functions (Sannigrahi et al., 2019). The ecosystem service value of karst regions extends beyond serving as a raw material source for cement; it also encompasses environmental and ecological benefits, both within the karst areas themselves and in the surrounding buffer zones (Wisnuaji & Fauzi, 2022). Economic valuation is commonly used as an approach to assess ecosystem services. In a study conducted in Ecuador, economic valuation was employed to assess the ecosystem services provided by coastal areas (Zambrano-Monserrate et al., 2018).

According to research, there are three fundamental approaches to assessing ecosystem services or economic valuation: the hedonic pricing approach, the Travel Cost Method (TCM), and the Contingent Valuation Method (CVM) (Zambrano-Monserrate et al., 2018). However, other studies have mentioned additional assessment methods, including Contingent Value (CV), Avoided Cost (AC), Reclamation Cost (RC), Production Approach (P), Hedonic Pricing (HP), Conjoint Analysis (CA), Travel Cost (TC), Replacement Cost (RC), and explicit spatial biophysical modeling approach (Sannigrahi et al., 2019). These assessment methods are employed to understand the benefits derived from ecosystem services. One commonly used approach in assessing a region is the Travel Cost Method (TCM). TCM is classified into three different categories: Individual Travel Cost Method (ITCM), Zonal Travel Cost Method (ZTCM), and the Random Utility Model (RUM), which combines TCM with Contingent Value (Torres-Ortega et al., 2018). In several studies, TCM is defined as a revealed preference method that links the costs of recreational activities to resource characteristics. The method is based on demand theory,

which assumes that demand for a location is inversely related to travel costs (Torres-Ortega et al., 2018). In other research, it's explained that travel costs are based on the concept that the expenditures and time individuals spend during recreational trips to natural open spaces can be used to derive the value of those sites (Caranza & Calderon, 2022).

Assessing ecosystem services through economic valuation is regarded as an indicator measuring an ecosystem service in monetary terms, reflecting its value in economic units. Therefore, research emphasized that when the economic value of an ecosystem service exceeds the cost of its mismanagement, this economic valuation data can be utilized to safeguard and sustainably manage the ecosystem (Zambrano-Monserrate et al., 2018). Given the crucial importance of karst regions for both human and other life forms, it is essential to conduct economic valuation of these areas. The objective is to offer guidance to policymakers for the conservation of karst regions. In practical terms, the Travel Cost Method (TCM) is employed to establish connections between the expenses incurred during recreational activities and the specific attributes of the natural resource. These attributes encompass a range of factors such as fuel costs, admission fees, and travel duration (Torres-Ortega et al., 2018). Another study that employed TCM to economically evaluate karst regions focused on the assessment of the Capisaan Cave System in Nueva Vizcaya, Philippines (Caranza & Calderon, 2022). Researchers applied the Zonal Travel Cost Method (ZTCM) to assess this tourist destination, taking into account factors like travel expenditures, access charges, equipment costs, and the time spent. The outcomes of this investigation revealed that the ZTCM approach is particularly suitable for single visitation trips. Additionally, the transformation of data into natural logarithms enhanced the linearity between variables, specifically between recreational value and access value (Caranza & Calderon, 2022).

This study aims to assess the economic value of the Klapanunggal Karst region by applying the Travel Cost Method (TCM). Economic valuation of the Klapanunggal Karst zone using the Travel Cost Method (TCM) is expected to protect the Klapanunggal karst area from exploitation of cement raw material mining activities. In this research, the economic valuation of the Klapanunggal karst area is novelty compared to previous research. The outcomes of this economic evaluation pertaining to the Klapanunggal Karst area are anticipated to offer crucial insights to a wide array of stakeholders, encompassing governmental bodies and industrial entities. This invaluable data serves as a guiding resource to assist them in devising pertinent strategies for the administration and preservation of the Klapanunggal Karst region.

METHODOLOGY

This research utilizes a mixed-method approach, combining both quantitative and qualitative research techniques. The methodology encompasses on-site observations, the dissemination of questionnaires, and the application of the Travel Cost Method to assess the economic value of the Klapanunggal Karst region. The Travel Cost Method is a recognized approach for estimating economic value, taking into account the travel costs incurred by visitors.

This research utilizes a combination of primary and secondary data sources. Primary data is gathered through direct observations conducted at the research site and the administration of questionnaires. In contrast, secondary data is derived from reports

Economic Valuation of the Klapanunggal Karst Region Using the Travel Cost Method
Jamaludin et al. (2024)

Jki

provided by the Bogor Regency Tourism Office, prior research outcomes, and a comprehensive review of relevant literature. The Klapanunggal Karst area is subdivided into four distinct zones by the researcher, specifically Zones 1 and 2 within the Leuwikaret Village, Zone 3 situated in the Klapanunggal Village, and Zone 4 located within the Ligarmukti Village. Following this categorization, the researcher employed a Google Form questionnaire, randomly distributed to respondents who had previously visited the Klapanunggal Karst region, using a random sampling method. The questionnaire collected a range of demographic information from respondents, encompassing age, gender, marital status, place of residence, educational background, occupation, income, annual visitation frequency, travel expenditures, accommodation preferences, distance traveled from their place of origin, and their awareness of the Karst Natural Landscape Area (KBAK). To determine the necessary number of respondents for this study, the Slovin formula was applied. With a margin of error set at 5%, the minimum requisite number of respondents for this research was calculated to be 100 participants.

In the process of determining the economic worth of the Klapanunggal Karst area, the researcher employed the Travel Cost Method for analysis. Subsequent to gathering primary data from respondents, data input and validity and reliability tests are conducted. Following this, a regression analysis of the data is executed using SPSS 26 software. The regression analysis, alongside a suitable functional format, is employed to estimate the demand function or equation connecting per capita visits with travel expenditures and other pertinent variables (Caranza & Calderon, 2022). The regression analysis was employed to investigate the correlation between the variable of the number of tourist visits, serving as the dependent variable, and the independent variables. In a general sense, the linear regression equation concerning the number of tourist visits is as follows:

Linear Model Equation

$$Y = a + b\,(TC) \qquad\qquad ...(1)$$

Y = The annual number of visits
TC = The total expenses incurred by respondents

In calculating economic valuation using the Travel Cost Method, the researcher compute consumer surplus. By performing this calculation of consumer surplus, the researcher can ascertain the willingness to pay (WTP), as these two measures can be considered synonymous. The formula employed for determining the consumer surplus is as follows:

Consumer Surplus Formula

$$WTP \approx CS = \frac{Y^2}{2\beta} \qquad\qquad ...(2)$$

Y = The number of visits made by an individual
CS = Consumer surplus
β = Regression coefficient for travel cost

Once the consumer surplus is determined, the researcher proceed to calculate the economic valuation by multiplying the consumer surplus per visitor by the total actual number of visits as indicated in the secondary data acquired.

FINDINGS AND DISCUSSION

This research was conducted in the Karst Natural Landscape Area (KBAK) of Bogor, specifically in the Klapanunggal zone, which is situated in Leuwikaret Village and Ligarmukti Village, Klapanunggal Subdistrict, Bogor Regency, West Java Province. The research location falls within the Klapanunggal Subdistrict, Bogor Regency, covering an area of 90.82 square kilometers. Geographically, the Klapanunggal Subdistrict is located between 6°32'36" Southern Latitude and 6°44'36" Southern Latitude and 106°33'54" East longitude and 106°39'17" East longitude.
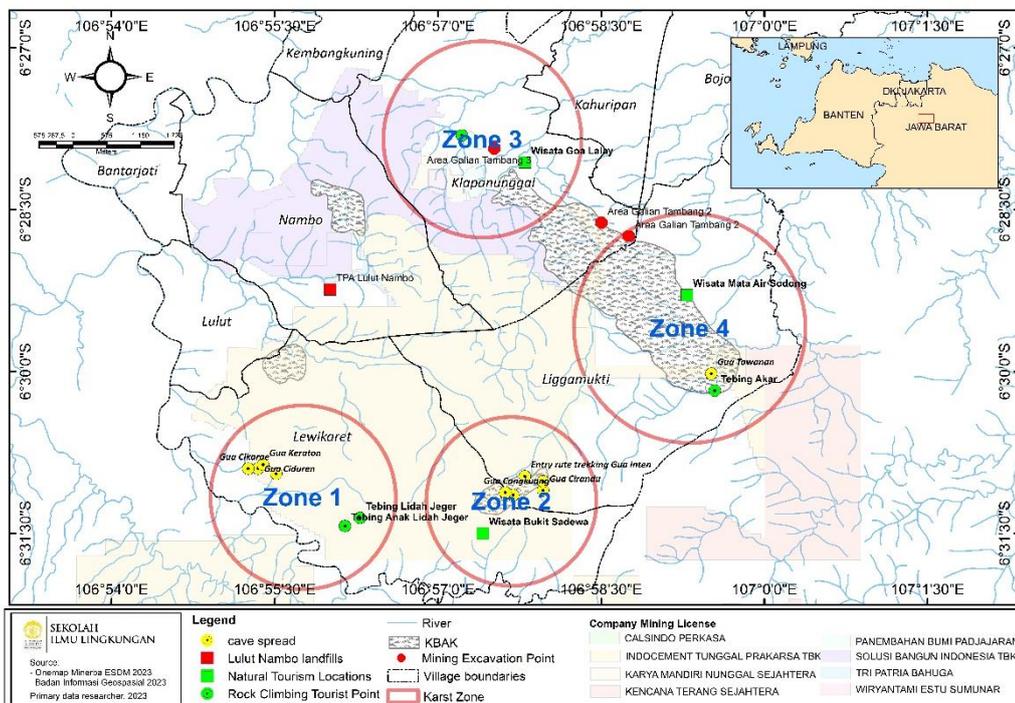
Figure 1. Research Site Map and Zoning of Potential Tourist Areas in the Klapanunggal Karst Region
Source: Primary data researcher, 2023

According to data obtained from the Bogor Regency Central Statistics Agency (BPS), the Klapanunggal Subdistrict is situated in the eastern part of Bogor, with an area of 70.57 square kilometers as of 2021, accounting for 2.36% of the total area of Bogor Regency. Furthermore, the administrative boundaries of this area are as follows.
   a.   To the north: Gunung Putri Subdistrict, Bogor Regency
   b.   To the east: Jonggol Subdistrict, Bogor Regency
   c.   To the south: Babakan Madang Subdistrict, Bogor Regency
   d.   To the west: Citeureup Subdistrict, Bogor Regency

According to the Minister of Energy and Mineral Resources of the Republic of Indonesia Decree Number: 24.K/40/MEM/2020 Regarding the Designation of the Bogor

Economic Valuation of the Klapanunggal Karst Region Using the Travel Cost Method
Jamaludin et al. (2024)

Jki

Karst Natural Landscape Area (KBAK), the Klapanunggal zone covers an area of 663.65 hectares. KBAK in the Klapanunggal zone encompasses four villages, namely Leuwikaret Village, Ligarmukti Village, Klapanunggal Village, and Nambo Village. The research focus, guided by field observations conducted by the researcher and spatial analysis using spatial data acquired by the researcher, centers on three of these villages: Leuwikaret Village, Klapanunggal Village, and Ligarmukti Village. These villages house numerous established tourist destinations, offering both natural attractions and special interest sites. Notable among them are Sodong Spring for nature-based tourism, Lalay Cave for cave exploration, rock climbing areas like Akar Rock, Anak Lidah Jeger Rock, and Lidah Jeger Rock, along with cave exploration at Cikarae Cave, and nature-based tourism at Sadewa Hill. The selection of these locations is predicated on secure access routes that avoid mining areas. For a comprehensive overview, Figure 1 illustrates the distribution of tourist sites, mining sites, and the regional waste processing and final disposal site in Lulut Nambo.
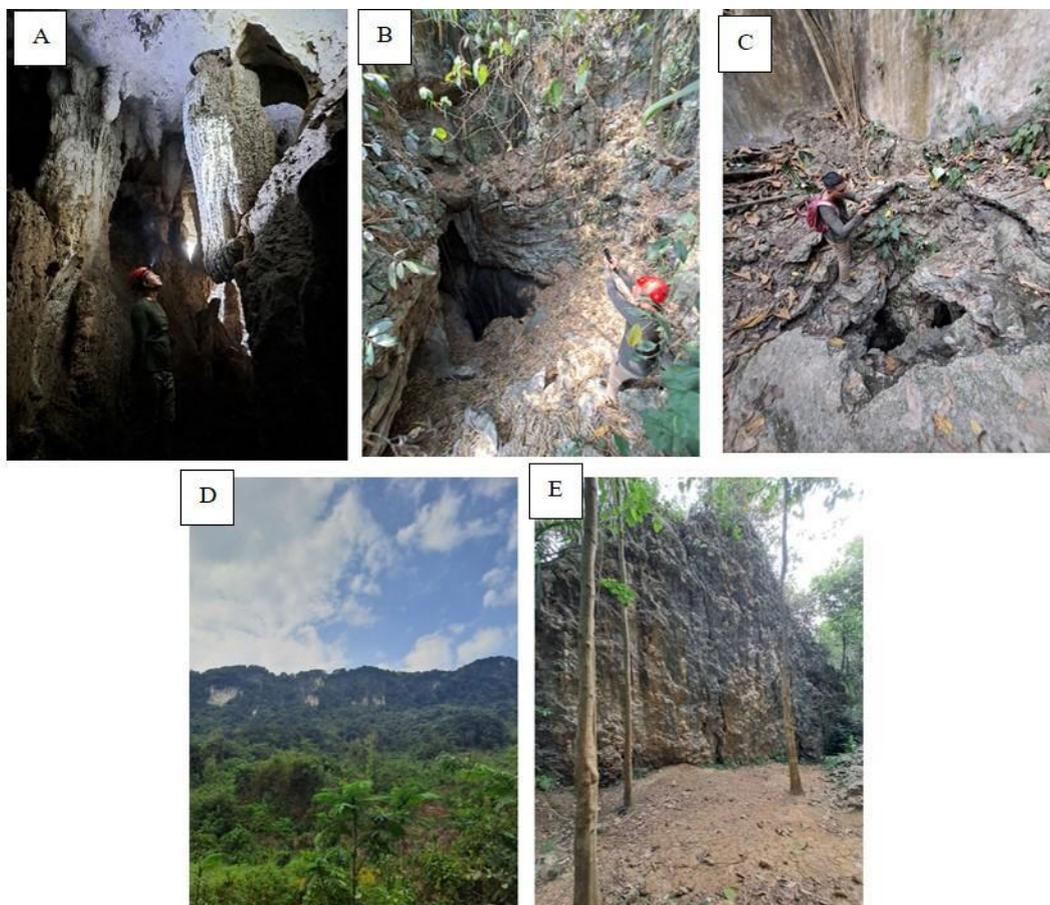
Figure 2. Tourist Attractions in Zone 1 of Klapanunggal Karst, Kampung Guha Siangin. (A) Keraton Cave; (B) Cidomba Cave Entrance; (C) Ciduren Cave Entrance; (D) Karst Hill Lidah Jeger Cliff; and (E) Anak Lidah Jeger Cliff
Source: Primary data researcher, 2023

During the research period spanning from June to September 2023, the researcher conducted on-site visits to explore the tourist sites within the Klapanunggal Karst area. Drawing from these field observations, the researcher partitioned the Klapanunggal Karst region into four distinct zones, each centered around specific tourist attractions. Zone 1

emerged as a focal point for special-interest tourism activities, encompassing cave exploration and rock climbing adventures, and is primarily located within Kampung Guha Siangin, situated in Leuwikaret Village. Within Zone 1, several caves of tourist interest are characterized by unique features, including both vertical and horizontal cave structures (Figure 2). A notable example is the Keraton Cave, distinguished by a horizontal entrance leading to a vertical section typically navigated using the single rope technique (SRT). Furthermore, the closely situated caves in this area facilitate convenient access via trekking routes. Zone 1 also encompasses a cluster of cliffs that attract rock climbing enthusiasts, prominently including the Lidah Jeger Cliff and the Anak Lidah Jeger Cliff. However, the spatial analysis, involving an overlay of the map delineating cement industry concessions with that of the Klapanunggal Karst Natural Landscape Area (KBAK) within the Klapanunggal zone, indicates that this area falls within the jurisdiction of the cement industry for licensing purposes. Consequently, it holds the potential to serve as a source of raw materials for cement production.
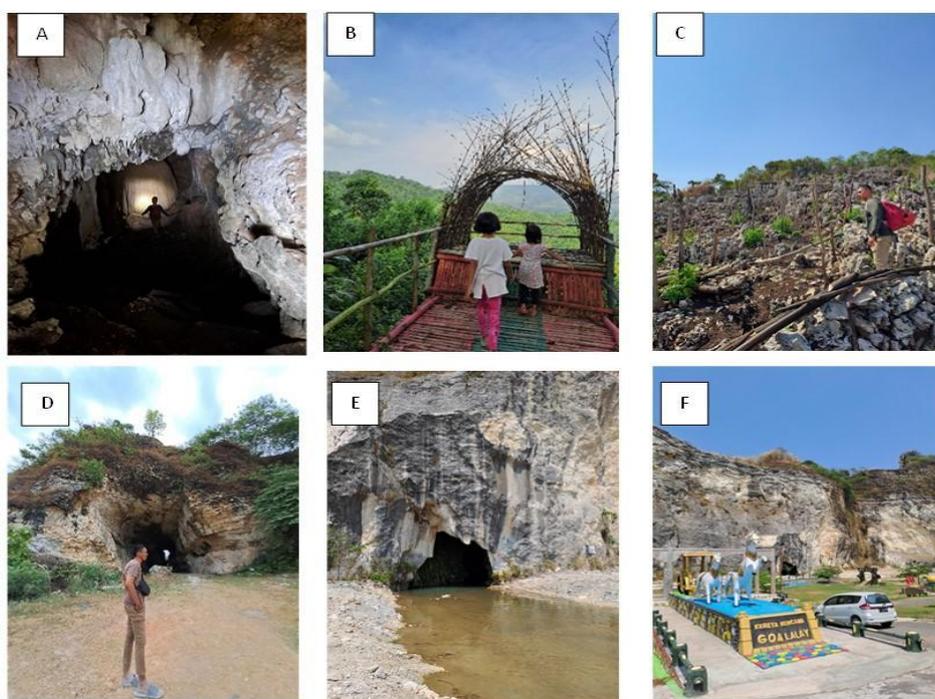
Figure 3. Tourist Attractions in Zone 2 of Klapanunggal Karst, Kampung Cioray, and Zone 3 of Klapanunggal Karst in Klapanunggal Village. (A) Inten Cave; (B) Sadewa Hill Tourist Park; and (C) Karst Hill Landscape in Kampung Cioray; (D) Arpam Cliff; (E) Lalay Cave; and (F) Lalay Cave Tourist Park. Source: Primary data researcher, 2023

Zone 2 in Klapanunggal features several cave potentials, including Inten Cave, Cirandu Cave, and Cangkuang Cave (Figure 3). However, most of these caves are characterized by their vertical attributes, requiring Single Rope Technique (SRT) for exploration. This zone exhibits higher tourism potential compared to other zones within Klapanunggal Karst. Spatial analysis places Zone 2 within the Klapanunggal Karst Natural Landscape Area (KBAK), where the impacts of the cement industry are minimal, resulting in a non-dusty environment. To reach this area, researchers must pass through the dusty cement factory zones in Lulut Village and Tajur Village. On the other hand, Zone 3 in

Economic Valuation of the Klapanunggal Karst Region Using the Travel Cost Method
Jamaludin et al. (2024)

JKi

Klapanunggal is an area known to special interest tourism enthusiasts. It is a karst region formerly utilized as community mining land and is currently within the cement industry's concession. Presently, the community has developed this region into a tourist attraction on former mining land. The notable attractions in this area are the natural tourism sites Lalay Cave and Arpam Cliff. Among the four zones of Klapanunggal Karst, Zone 3 is the most heavily contaminated by dust from mining activities.
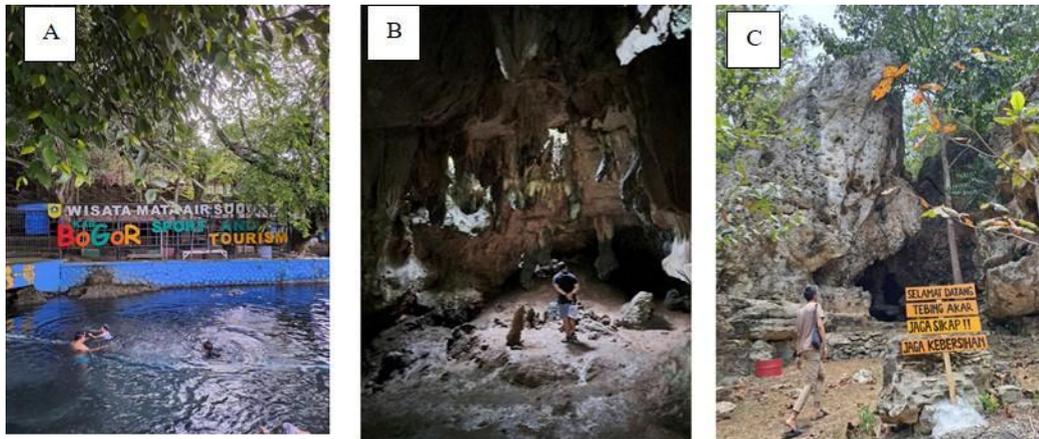
Figure 4. Tourist Attractions in Zone 4 of Klapanunggal Karst, Ligarmukti Village. (A) Mata Air Sodong Tourism Park; (B) Tawanan Cave; and (C) Akar Cliff.
Source: Primary data researcher, 2023

The last subdivision of the Klapanunggal Karst area is Zone 4, located in Ligarmukti Village. This zone is unique as it has been developed into a tourism village. Within Zone 4, prominent attractions include the Mata Air Sodong Bathing facility, which is supported by the Bogor Regency Tourism Office (Figure 4). This area also features Tawanan Cave and Akar Cliff. Zone 4 is notably the most secluded zone and least impacted by cement industry operations.

Figure 5. Pie Charts (A) Respondents' Place of Residence and (B) Respondents' Highest Education Level
Source: Primary data researcher, 2023

The primary criterion for visitors, based on their place of residence, reveals that the majority of respondents, 44%, come from the Jakarta Special Capital Region (DKI Jakarta), while the second-largest group comprises 17 respondents originating from the Bogor Regency (Figure 5). Regarding the educational background of respondents, those with tertiary education qualifications constitute the largest group at 55%, followed by

individuals with secondary education or its equivalent, constituting 28% of the respondents, and those with a high school or equivalent level of education, totaling 17%. Examining income data, 68.8% of the total respondents, which amounts to 75 individuals, have an income exceeding IDR 3,500,001. Another group of 19 respondents, or 17.4%, falls within the income range of IDR 2,500,001 to IDR 3,500,000. Subsequently, 11.9% of the respondents, accounting for 13 individuals, have an income below IDR 1,500,000. Finally, 1.8% of the total respondents, equivalent to 2 individuals, falls within the income range of IDR 1,500,001 to IDR 2,500,000. In summary, it is evident from Table 1 that the Klapanunggal Karst region predominantly attracts visitors with the financial capacity and high purchasing power.

Table 1. Respondents' Income Range

No.	Respondent's Income	Frequency	Percent	Valid Percent	Cumulative Percent
1.	Under IDR 1,500,000	13	11.9	11.9	11.9
2.	IDR 1,500,001 - IDR 2,500,000	2	1.8	1.8	13.8
3.	IDR 2,500,001 - IDR 3,500,000	19	17.4	17.4	31.2
4.	Above IDR 3,500,001	75	68.8	68.8	100.0
Total		109	100.0	100.0	

Source: SPSS 26 processed results modified by researchers, 2023

Based on the research data, the majority of respondents exhibit a strong inclination towards sports tourism. Rock climbing emerges as the most popular form of tourism, attracting 71 respondents, constituting 69.7% of the total respondents, who display a considerable enthusiasm for this pursuit. The second most preferred type of tourism is nature conservation tourism, with 61 respondents, or 56% of the total respondents. The third most sought-after type of tourism is shopping tourism, with 9 respondents, representing 8.3% of the total respondents. Lastly, hunting tourism attracted 7 respondents, accounting for 6.4% of the total respondents. This emphasizes the dominant characteristics of respondents visiting the Klapanunggal Karst area, mainly comprising individuals with a tendency for sports and nature-based tourism (Table 2). Typically, tourists with a strong interest in nature-based and sports tourism are categorized as special-interest tourists. Nature-based and sports tourism can also be referred to as hobby tourism, with tourists making recurrent visits to partake in these activities.

Table 2. Types of Tourism That Respondents are Interested in

No.	Type of Tourism You are Interested in	Frequency	Percentage	Percentage of Total Respondents
1.	Beach tourism	38	9.5	34.9%
2.	Ethnic Tourism	29	7.3	26.6%
3.	Nature Reserve Tourism	61	15.3	56.0%
4.	Hunting Tourism	7	1.8	6.4%
5.	Sports Tourism	76	19.0	69.7%
6.	Culinary tour	37	9.3	33.9%
7.	Religious Tourism	13	3.3	11.9%
8.	Agro Tourism	23	5.8	21.1%
9.	Cave Tourism	47	11.8	43.1%
10.	Shopping tour	9	2.3	8.3%
11.	Ecological Tourism	21	5.3	19.3%
12.	Culture tour	38	9.5	34.9%

Economic Valuation of the Klapanunggal Karst Region Using the Travel Cost Method
Jamaludin et al. (2024)

Jki

No.	Type of Tourism You are Interested in	Frequency	Percentage	Percentage of Total Respondents
Total		399	100.0	366.1%

Source: Results processed by researchers, 2023

Based on the research findings, the predominant activity among respondents during their visits to the Klapanunggal Karst area is rock climbing tourism, with 88 respondents (constituting 80.7% of the total respondents) participating in this activity (Table 3). Additionally, cave exploration tourism attracted 48 respondents, accounting for 44% of the sample. Ecotourism was the choice of 21 respondents, making up 13.2% of the respondents. A smaller fraction, specifically 2 respondents (or 1.8% of the total), engaged in alternative forms of tourism, including research and family visits, primarily because they resided in the proximity of the Klapanunggal Karst area.

Table 3. Types of Tourism Undertaken by Respondents in the Klapanunggal Karst Area

No.	Type of Tourism	Number of Respondents	Percentage	Percentage of Total Respondents
1.	Caving	48	30.2	44.0%
2.	Rock_Climbing	88	55.3	80.7%
3.	Ecotourism	21	13.2	19.3%
4.	Other	2	1.3	1.8%
Total		159	100.0	145.9%

Source: Results processed by researchers, 2023

Base on the research data, it becomes evident that the predominant choice among respondents was to partake in group visits during their trips to the Klapanunggal Karst area (Table 4). Specifically, 34 respondents, constituting 31.2% of the total sample, visited with friends from their community. Furthermore, 23 respondents, or 21.1%, conducted their visits with friends from their educational institution, be it campus or school. Family trips involving immediate family members were undertaken by 21 respondents, making up 19.3% of the total. In contrast, 18 respondents, or 16.5%, preferred visiting with friends from their workplace. Additionally, 10 respondents, or 9.2%, enjoyed their visits with friends at home. Only a small fraction of 3 respondents, equivalent to 2.8% of the total, opted for solitary travel. These data demonstrate that the vast majority, 97.8% of respondents, conducted their visits to the Klapanunggal Karst area in groups, typically consisting of more than 2 individuals.

Table 4. Method of Visiting by Respondents

No.	How to Visit	Number of Respondents	Percent	Valid Percent	Cumulative Percent
1.	Alone	3	2.8	2.8	2.8%
2.	Main family	21	19.3	19.3	22.0%
3.	Friends At Home	10	9.2	9.2	31.2%
4.	Friends at Campus or School	23	21.1	21.1	52.3%
5.	Friends in the Office or Workplace	18	16.5	16.5	68.8%
6.	Community Friends	34	31.2	31.2	100.0%
Total		109	100.0	100.0	

Source: Results processed by researchers, 2023

In the analytical phase, the researcher employed a multiple regression analysis and made use of SPSS 26 software. The primary objective of this analysis was to determine the economic valuation through the application of the Travel Cost Method (TCM). The primary focus of the analysis rested on the examination of the dependent variable, which pertained to the count of visits respondents made to the Klapanunggal Karst area within a one-year timeframe. In addition to this, the researcher conducted a comprehensive examination of various independent variables. These encompassed factors such as the respondents' highest level of education (X1), their average income (X2), the expenses they incurred (X3), the distance traveled from their place of origin (X4), and their familiarity with the Klapanunggal Karst Natural Landscape Area (KBAK) (X5).

Table 5. Research Data Validity Test Results

Code Variable	Variable	r count	Say. (2-tailed)	Valid if item significance < 0.05	Valid If r count > 0.1584 (r table)
X1	Last education	0.590	0.000	Valid	Valid
X2	Average income	0.697	0.000	Valid	Valid
X3	Cost incurred	0.642	0.000	Valid	Valid
X4	Distance traveled from the origin location	0.632	0.000	Valid	Valid
X5	Knowledge related to Klapanunggal Zone KBAK	0.126	0.191	Invalid	Invalid

Source: Results processed by researchers, 2023

In accordance with the existing literature on the Travel Cost Method (TCM), it is customary for researchers to incorporate variables such as the highest level of education attained, income, and travel expenses into their analyses. The selection of these variables is predicated on an extensive review of previous research, including economic assessments in tourism contexts like Capisaan Cave, natural springs in Florida, and Prespa National Park in Greece (Table 6). The findings of the validity test conducted using SPSS 26 indicated that the variable associated with respondents' knowledge of the Klapanunggal Karst Natural Landscape Area (KBAK) lacked validity (Table 5). This determination was founded on a significance level exceeding 0.05, specifically registering at 0.191. As a result, the researcher opted to exclude this variable from subsequent analyses.

Table 6. Economic Valuation Variables with TCM in Previous Research

Tourist Destination	Method	Variable	Reference
Capisaan Cave System, New Vizcaya, Philippines	*Zonal Travel Cost method* (ZTCM)	● Travel expense ● Access Fees ● Equipment Costs ● Time Cost	Caranza and Calderon (2022)
Natural Spring in Florida	*Travel Cost Method*	● Journey ● Household Income ● Travel expense ● Replacement ● Personal ● Perception for facilities ● Perception for water clarity ● Past experience	Wu et al. (2018)

Economic Valuation of the Klapanunggal Karst Region Using the Travel Cost Method
Jamaludin et al. (2024)

JKi

Tourist Destination	Method	Variable	Reference
Prespa National Park in Greece	*Travel Cost Method*	● Gender ● Age ● Income ● Education ● Travel time ● Travel expense	Latinopoulos (2020)

Source: Results of processed researcher data, 2023

In the following step, the researcher conducted a reliability assessment to ascertain that the questions presented to the respondents in the questionnaire were reliable and possessed a high level of confidence. Based on the results of the reliability test conducted using SPSS 26, it was found that 109 respondents achieved a 100% reliability rate. With 109 respondents, and employing a two-tailed significance test with a significance level of 0.05, the critical r value was determined to be 0.1584.

Table 7. Reliability Test Sesults with Values *Cronbach's Alpha* Before and After Removing Variables

Reliability Statistics (before)		Reliability Statistics (after)	
Cronbach's Alpha	N of Items	Cronbach's Alpha	N of Items
0.113	4	0.169	2

Source: Results processed by researchers, 2023

Subsequently, the researcher conducted a reliability test by examining the Cronbach's Alpha value, which yielded a result of 0.114 (Table 7). This outcome falls below the critical r value of 0.1584. This value indicates that all the utilized variables lack reliability, meaning they are not reliable and consistent, and therefore, cannot be employed in the subsequent analysis stages.

Table 8. Reliability Test Results Using SPSS 26

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
X1	3,480,167.50	513,525,446,371.881	0.445	0.127
X2	333,394.30	28,792,464,603.582	0.193	0.002
X3	3,147,155.77	441,279,906,176.807	0.193	0.000
X4	3,479,832.31	513,433,127,249.549	0.286	0.127

Source: Results processed by researchers, 2023

Accordingly, the researcher eliminated two variables, namely the highest education level (X1) and the distance traveled from the place of origin (X4), in order to enhance the reliability value. With only two remaining variables, which are income (X2) and visitor expenses (X3), a Cronbach's Alpha value of 0.169 was obtained (Table 7). This value exceeds the critical r value of 0.1584, indicating that the data employed for analysis is considered reliable, trustworthy, and consistent (Table 8). The researcher proceeds to the next analytical phase, which involves conducting multiple linear regression to establish a model for the equation representing the number of tourist visits to Klapanunggal in a year (Y).

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The research findings, obtained from 109 respondents who have visited the Klapanunggal Karst area using two independent variables at a 0.05 probability level, show a t-table value of 1.65895 and an F-table value of 3.08. The regression analysis conducted using SPSS 26 produced an F-value of 0.901, which is smaller than the critical F-table value (Table 9). This outcome suggests that neither the variable of average income (X2) nor the expenditure amount (X3) exerts a statistically significant influence on increasing the number of tourist visits to the Klapanunggal Karst area. Based on this analysis, the Klapanunggal Karst area remains highly attractive to tourists. The characteristics of respondents visiting this area are not influenced by income levels or the amount of expenses incurred.

Table 9. Linear Regression Results Using SPSS (ANOVA)

	Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	18.768	2	9.384	0.901	.409[b]
	Residual	1,104.205	106	10.417		
	Total	1,122.972	108			

a. Dependent Variable: Number of Visits to the Klapanunggal Karst Area in a Year (Y)
b. Predictors: (Constant), X2, X3

Source: Results processed by researchers (2023)

A linear regression analysis was performed by the researcher, resulting in a constant value of 6.032 (Table 10). Consequently, it can be concluded that the variables X2 and X3 maintain a constant value. Thus, the annual number of visits to the Klapanunggal Karst area is established at 6.032 times.

Table 10. Results of SPSS Linear Regression Data Processing (Coefficients Values)

		Unstandardized Coefficients		Standardized Coefficients		
	Model	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	6.032	1.540		3.918	0.000
	X2	-2.960E-07	0.000	-0.061	-0.621	0.536
	X3	-1.955E-06	0.000	-0.103	-1.048	0.297

a. Dependent Variable: Number of Visits to the Klapanunggal Karst Area in a Year

Source: Results processed by researchers (2023)

Following the outcomes of the regression analysis, the equation representing the model for the quantity of visits to the Klapanunggal Karst area is presented below. The linear model formula for the number of visits to the Klapanunggal Karst area in a year is as follows:

$$Y = 6.032 - 2.960X2 - 1.955X3 + 0.05 \qquad \text{...(3)}$$

Y = the number of visits per year
X2 = average monthly income
X3 = the amount of expenses incurred

Economic Valuation of the Klapanunggal Karst Region Using the Travel Cost Method
Jamaludin et al. (2024)

Jki

The interpretation of the variables, average income (X2) and visitor expenses (X3), based on the data processing results of the equation for the number of visits to the Klapanunggal Karst area (Y), is outlined as follows:

Constant Value

The constant within the equation stands at 6.032. This value signifies that when the variable for average income is considered either equal to zero or non-existent, the estimated number of visits amounts to 6.032 times per year.

The Impact of Average Income on the Number of Tourist Visits to the Klapanunggal Karst Area

In this research, respondents' average income pertains to their monthly earnings or income. Data on this variable was obtained through the completion of questionnaires. The study delineated various income ranges, which are detailed in Table 1. The outcome of the multiple regression analysis revealed a coefficient of -2.960 for the income variable. The negative coefficient implies that with an increase in income, the number of visits tends to decline. Specifically, a one-unit increment in income results in a reduction of 2.960 visits annually. Subsequently, to evaluate the statistical significance of income growth in relation to the number of visits, the significance value (sig) for the income variable was computed as 0.536, exceeding the 0.05 threshold. These findings indicate that the effect of income on the number of visits is not statistically significant.

The Influence of Visitor Expenses on the Increase in the Number of Tourist Visits

The multiple regression analysis ascertained that the coefficient for the expense variable is -1.955. This negative coefficient implies that an upsurge in visitor expenses leads to a decline in the number of visits. To be precise, a one-unit augmentation in visitor expenses results in a reduction of 1.955 visits per year. Subsequently, in the evaluation of the statistical significance of heightened visitor expenses in relation to the number of visits, the significance value (sig) for the expense variable was computed as 0.297, exceeding the 0.05 threshold. These results suggest that the impact of increased visitor expenses on the number of visits is not statistically significant.

According to Sannigrahi et al. (2019), the economic value of ecosystem services involves a methodology to quantify and evaluate the economic worth of ecosystem products and services, along with their associated functions. In this investigation, the calculations were obtained through the regression equation, resulting in a consumer surplus of IDR 7,696,702.06 annually per tourist, equivalent to IDR 15,869.49 for each individual visit, as seen in Table 11.

Table 11. Average Consumer Surplus Calculation Results

Variable	Amount	Notes
Total Respondent Visits in 1 Year (Y$_{respondent}$)	485	MS Excel calculation results
Consumer Surplus Per Tourist	IDR 7,696,702.06	MS Excel calculation results
Average consumer surplus / tourists / number of respondents' visits 1 year	IDR 15,869.49	MS Excel calculation results

Source: Results processed by researchers, 2023

To obtain the economic value of the Klapanunggal Karst area using the Travel Cost Method (TCM), the researcher computed the consumer surplus value multiplied by the actual number of visits over the course of one year. Based on the secondary data acquired, visitation to the Klapanunggal Subdistrict is relatively low. In 2019, there were only 540 visits throughout the year. Consequently, the economic valuation of the Klapanunggal Karst area is determined to be IDR 4,156,219,112.40 annually (Table 12).

Table 12. Calculation Results of the Economic Value of the Klapanunggal Karst Area Using TCM

Variable	Amount	Notes
Number of Research Respondents	109	
Average Consumer Surplus (CS) /Tourists/Year	IDR 7,696,702.06	$CS = \dfrac{AND^2}{2\beta}$
Travel Cost Coefficient (β)	-1.95	SPSS Regression Results
Total visits to tourist areas in 1 year (Y_{2019})	540	Data Seconds (2019)
Economic Value of the Klapanunggal Karst Area	IDR 4,156,219,112.40	EV = CS x Y_{2019}

Source: Results processed by researchers, 2023

Currently, the Klapanunggal Karst area can be characterized as an underdeveloped tourist destination, primarily owing to the scarcity of information and data pertaining to tourism visits in this region. The researcher obtained valid secondary data from the Bogor Regency Tourism Office, including data from 2016 to 2017, as well as actual visitation data for the year 2022 up to August 2023 (Table 13). The data from 2016 to 2017 were gathered by the office during a cave inventory in the sub-districts of Babakan Madang, Citeureup, and Klapanunggal. Additionally, other secondary data from the year 2019 were sourced from the BPS (Central Statistics Agency). In order to analyze the annual visitation patterns, the researcher made the assumption that the percentage of tourist visits to the Klapanunggal Subdistrict carries equal significance to the overall tourism visitation numbers for the entire Bogor Regency.

Table 13. Secondary Data Number of Tourist Visits to Klapanunggal

Year	Number of Visits	Total Visits (people)	Percentage (%)
2016	Klapanunggal District[1]	532	0.006%
	Total Tourist Visits for Bogor Regency[2]	8,791,300	
2017	Klapanunggal District[1]	844	0.012%
	Total Tourist Visits for Bogor Regency[2]	7,300,134	
2019	Klapanunggal District[3]	540	0.006%
	Total Tourist Visits for Bogor Regency[2]	9,484,957	
2020	No data		
2021	No data		
2022	Klapanunggal District[4]	464	0.006%
	Total Tourist Visits for Bogor Regency[5]	8,157,531	
2023	Klapanunggal District[4]	441	0.006%
	Total Tourist Visits for Bogor Regency[5]	7,740,203	

Information:

[1] Bogor Regency Cave Inventory Data 2017

[2] Bogor Regency BPS data 2014 - 2019

[3] BPS data on number of tourists visiting tourist attractions per sub-district 2019

Economic Valuation of the Klapanunggal Karst Region Using the Travel Cost Method
Jamaludin et al. (2024)

Jki

Source: Results processed by researchers, 2023

On the basis of this premise, it can be inferred that tourist visits to the Klapanunggal Subdistrict between 2016 and 2023 are remarkably scarce, constituting a mere 0.006% of the total count of annual international and domestic tourists in Bogor Regency. The economic assessment of the Klapanunggal Karst area is anticipated to offer guidance to stakeholders concerning tourism development in the locale, with the potential to invigorate increased tourism. The progression of tourism is foreseen to play a role in preserving the ecological functions of the karst region. Previous research has highlighted the economic significance of karst areas, serving as a direct source of water resources and other natural assets for the community (Wisnuaji & Fauzi, 2022). This investigation highlights that any harm inflicted upon the karst area will consequently erode the value of its direct utility.

Karst regions play a vital role in the ecosystem, offering direct benefits through the utilization of water resources and other natural assets. Additional research has highlighted other essential functions of karst regions, such as their capacity to store significant quantities of organic and inorganic carbon (Danardono et al., 2019). The study aimed to estimate the economic value of carbon in the Biduk-biduk karst region. Researchers identified the value of carbon reserves and calculated carbon biomass stocks above and below the soil surface, as well as in litter. Additionally, they assessed carbon concentrations in carbonate rock formations, representing inorganic carbon reserves, using the cost-benefit transfer method (Danardono et al., 2019).

At present, the Klapanunggal karst area is being utilized for limestone extraction, mainly as a fundamental resource for cement manufacturing. When conducting a comprehensive economic assessment, the continued mining operations lead to a depletion of the economic value associated with the functions of the karst ecosystem. This includes the direct utility derived from water resources, the direct utility stemming from land coverage, and the economic worth of the karst region as a carbon reservoir.

CONCLUSION

Based on the research findings gathered through observational analysis, the Klapanunggal karst region is presently categorized into four distinct karst zones. The first zone, known as Klapanunggal Karst Zone 1, exhibits potential for specialized tourism activities, including cave exploration and rock climbing. However, this zone is currently under cement industry permits. Following this, Klapanunggal Karst Zone 2, situated within the Klapanunggal Karst Natural Landscape Area (KBAK), experiences challenges related to limited accessibility. Moving on to Klapanunggal Karst Zone 3, this zone has been significantly impacted, having once served as a limestone mining site, but has since been repurposed into a tourism destination. Finally, Klapanunggal Karst Zone 4 stands as the sole area officially designated as a tourist village, having received support from the Tourism Office of Bogor Regency.

The researcher also conducted an economic evaluation of the Klapanunggal Karst area. The results of this assessment, which utilized the Travel Cost Method (TCM), indicated that the Klapanunggal Karst area possesses an annual economic value of IDR

JKi

4,156,219,112.40. This valuation was based on the expenses incurred by respondents during their visits to the Klapanunggal Karst area. Additionally, the regression analysis concerning the number of tourist visits to the Klapanunggal Karst area led to the conclusion that neither income nor visitor expenses significantly impacted the visitation increase. Consequently, it can be inferred that the Klapanunggal Karst area holds a substantial economic value, as visitors do not take into account their income or the costs incurred during their visits. Furthermore, respondents predominantly exhibit an interest in nature conservation and sports tourism according to the criteria. The respondents also display a tendency to make repeat visits, underscoring the Klapanunggal Karst area's appeal as a destination for sports and nature tourism.

This research aims to provide stakeholders with valuable insights for crafting policies aimed at the development of the Klapanunggal Karst area. Transforming the karst region into a tourist destination holds the potential to uphold the sustainability of its vital ecosystem functions, which encompass its role as a water resource provider, contributor of various natural resources like land cover, and its significance as a carbon reservoir. In this study, the researcher restricted the economic evaluation of the karst area to the travel cost method, which is a recommended approach for considering its development as a tourist destination. As a result, it is essential to conduct further research to estimate the comprehensive economic worth of karst areas using alternative methodologies. These may involve resource benefit valuation, production-oriented models tailored to mining and agriculture, cost-benefit transfer techniques, and other diverse economic valuation approaches.

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Jamaludin et al. (2024)

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59

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TOURISTS' ATTITUDES TOWARDS HALAL TOURISM: THE ROLES OF PLACE ATTACHMENT AND RELIGIOSITY

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Article Info	Abstract
	This research aims to analyze tourists' attitudes towards the attributes of halal tourism (HT) destinations, moderated by place attachment and religiosity. This study contributes to the body of research on HT development because the conceptual model includes specific HT destination attributes and integrates place attachment theory and tourist psychographic characteristics (religiosity). This research is quantitative research with 355 respondents. The data were analyzed using Smart PLS. This research resulted in the conclusion that attitude towards HT destination development is influenced by three things, namely 1) attitude towards HT attributes, 2) religiosity of tourists, and 3) place attachment of tourists with the destination. The role of religiosity in forming attitudes towards HT destination development occurs directly and also as a moderator between attitudes towards HT attributes and attitudes towards HT destination development. Meanwhile, the role of place attachment in forming attitudes towards HT destination is a direct influence. In terms of public policymaking, this research provides important insight. The development and determination of HT destinations can receive approval and rejection in different destinations. Tourists can give different responses to the development of HT destinations for different destinations. In making these policies, tourists' opinions are very important to be taken into consideration in developing a tourist destination.

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INTRODUCTION

Halal tourism (HT) is one of the topics that is widely researched. HT is an interesting destination development topic for several reasons. First, the market potential of HT is very large. CrescentRating states that the estimated HT market in 2030 is 230 million Muslim tourists and USD 225 billion in expenditure by 2028 (CrescentRating, 2022; Future Market Insight, 2022). However, the development of HT has caused differences in acceptance in several regions. In Indonesia, which has the largest Muslim population in the world, there is some controversy regarding the rejection of HT development in several tourist destinations. This rejection has occurred in Bali (Retaduari, 2019), East Nusa Tenggara (Purboyo, 2019), North Sulawesi (Tawalujan, 2019), and North Sumatra (Putri, 2019).

This study seeks to understand and analyze HT development by specifically examining the criteria for HT destinations. This is done with the assumption that HT destinations themselves are not fully understood, namely, the specific criteria that a tourist destination must have to become an HT destination. Understanding these criteria can help clarify this definition. This is important because the Sharia Tourism discourse can cause polemics between Muslims and Christians, for example, what happened in Indonesia (Hapsin, 2023). Therefore, by adopting the criteria used by CrescentRating (2022), this research seeks to obtain responses on the approval or attitudes of tourists towards the attributes of HT destinations. Research that specifically mentions the attributes of HT destinations has been conducted by several researchers (Martaleni et al., 2022; Najib et al., 2020; Priyatmoko & Maulana, 2022). However, the attributes used are not criteria for assessing HT destinations, which are currently widely referred to and used as guides for developing HT destinations. CrescentRating regularly provides assessments of countries and actively issues issues and the status of developing HT destinations.

Attitudes towards these attributes form the overall attitude of tourists towards the development of HT in a tourist destination. However, if the development of HT can be considered appropriate for a particular destination, this does not mean that tourists will agree with the development of HT at other destinations. There is one factor that differentiates tourists' attitudes towards one place from another, namely place attachment (Dewi, 2023; Kyle et al., 2004; Moore & Graefe, 1994; Oh et al., 2012; Vaske & Kobrin, 2001). The Indonesian experience as explained earlier shows that attitudes towards halal tourism development can differ amongst places/destinations. Such a phenomenon requires an examination of tourist-destination connection which in turn will influence their attitude towards HT. Place attachment the connection between a person and a particular place. This connection can be functional or emotional (Lee & Oh, 2018). Research on HT has included this aspect and found that a person's attitude towards a place is place-specific. Therefore, this study analyzes the role of place attachment on tourists' attitudes towards the development of HT destinations.

Differences in attitudes towards developing halal destinations can also be caused by tourist characteristics (Abror et al., 2020, 2023; Sudarsono et al., 2021). Demographic and psychographic characteristics can determine a tourist's attitude. This study chose to use psychographic attributes, namely religiosity, as a factor that strengthens or weakens a person's attitude towards the development of HT in a particular destination.

Attitudes Towards Halal Tourism Development: The Roles of Place Attachment and Religiosity
Maesaroh et al. (2024)

Jki

With this background, this research aims to analyze 1) tourists' attitudes towards the attributes of HT destinations, and 2) the influence of attitudes towards the attributes of HT destinations on attitudes towards the development of HT in a particular destination, moderated by place attachment and religiosity. In one model construction, this study contributes to the body of research on HT development because it includes specific HT destination attributes and integrates place attachment theory and tourist psychographic characteristics (religiosity).

This research was conducted with a specific destination locus of Yogyakarta. Yogyakarta was chosen because it is one of Indonesia's favorite destinations and receives tourists in numbers that exceed its population. Apart from that, there has never been any controversy in Yogyakarta regarding the development of halal tourism at this destination.

HT is tourism developed based on Islamic principles and teachings, which include more than food and drink, namely tourism products and services provided and offered to tourists (Samori et al., 2016). In HT, tourist objects and activities are designed according to Sharia principles (Battour & Ismail, 2016). The CrescentRating (2022) defines HT as the origin of the word halal in Arabic, which is permitted and accepted following Islamic teachings. Therefore, all tourism products and services designed, produced, and provided to the market concerning Islamic teachings are called HT (Duman, 2012). HT itself is sometimes confused with Islamic tourism (e.g., research by Hanafiah et al., 2022). However, Kian et al. (2020) state that HT differs from Islamic Tourism. HT is a type of tourism that is based on Islamic principles and teachings but can be used for various purposes, including social and recreational purposes. Islamic tourism is carried out mainly for religious and pilgrimage purposes, which are based on Islamic principles and teachings.

The concept of HT has created different perceptions between Muslims and non-Muslims and among Muslims themselves (El-Gohary, 2016). Therefore, the definition of an HT must be described in terms of specific attributes (Battour & Ismail, 2014). Attributes are elements that form the perception of abstract concepts. The HT attributes used in this research are specific attributes that characterize HT formulated by CrescentRating (2022). In 2024, CrescentRating has 138 member countries. CrescentRating also gives awards to countries that are the best halal tourism destinations. Therefore, attributes developed by CrescentRating can be a reliable reference. These attributes are divided into three groups, namely 'need to have, ' 'good to have,' and 'nice to have' attributes. We must also bear in mind that the CrescentRating assesses HT destinations based on other generic attributes, such as destination infrastructure, safety, and destination comfort. These attributes are basic requirements for a competitive destination. Therefore, this study uses specific attributes that are directly related to products and services according to Islamic teaching, which are included in the criteria for halal destinations.

Attitude refers to the evaluation of people, objects, and ideas. Attitude reflects a person's favorable or unfavorable evaluations, perceptions, and feelings toward an attitude object (Eagly & Chaiken, 1993). Attitude is very important to study because it is a predictor of someone's behavior. Someone who agrees with a certain attitude object tends to behave accordingly (Keller, 1993; Wang et al., 2018). This study examines tourists' attitudes towards two things. The first is attitudes towards the HT attributes. This means a tourist's agreement with the terms or criteria for products and services that an HT destination must have. The second is attitudes towards developing halal destinations in a particular location. Attitudes towards HT attributes influence attitudes towards the development of HT

destinations. However, the intensity of influence depends on two moderating variables, namely place attachment and religiosity, as discussed below.

H1: Attitudes towards HT have a positive effect on attitudes towards halal destination development.

Place attachment is a concept that originated in the study of geography (Tuan, 1977). In general, place attachment is the connection between a person and a particular place (Bricker & Kerstetter, 2000; Low & Altman, 1992; Ramkissoon et al., 2013; Scannell & Gifford, 2010; Ujang & Zakariya, 2015; White et al., 2008). Place attachment is multi-dimensional. This connection can be a functional or an emotional relationship (Oh et al., 2012). As stated by Lee and Oh (2018), functionally, someone may be related to a place because they obtain economic benefits from their relationship with that place. Emotionally, a person's connection to a destination can take the form of concern and desire to maintain the status of a place that is considered special by that person. Concerns about the negative impact that will befall a place also include the emotional bond that forms between a person and a particular place. Dewi (2023) found that place attachment has a negative effect on attitudes towards the development of HT destinations.

H2: Place attachment has a negative effect on attitudes towards developing HT destinations.

If tourists are asked for their opinions regarding the attributes of HT, they will probably agree with the attributes of HT in general. However, if it is related to the development of HT destinations for a place where one has an attachment, one's attitude may be different. Even if someone has a certain attitude towards an attitude object, their relationship with a certain place can change the intensity of their agreement. This depends on a person's ties to a place in all its dimensions. A person may have a sense of belonging to a place. As Belk (1988, 1992) stated, a place becomes an extension of one's identity. Therefore, this study proposes place attachment as a moderating influence of attitudes towards HT attributes on attitudes towards the development of HT destinations.

H3: Place attachment moderates the effect of attitudes towards HT attributes on attitudes towards halal destination development.

Religiosity is a variable that is widely used to predict behavior. In general, religiosity refers to people's values and attitudes toward carrying out activities following their religious beliefs (Abror et al., 2020, 2023). Sudarsono et al. (2021) stated that religiosity is committed to one's religion and is seen in both cognitive and behavioral aspects. The effect of religiosity is also observed in a person's consumption choices. He and Tian (2023) studied the influence of religiosity on food consumption by Muslims. They stated that the impact of religion on consumption behavior is multidimensional and multifaceted. A Muslim's attitude towards HT attributes recommended in religious principles may not be exactly related to religious elements but is also influenced by cultural background, environment, and other factors that cause one's unique understanding of religious doctrines. Therefore, even though someone is formally adherent to a certain

Attitudes Towards Halal Tourism Development: The Roles of Place Attachment and Religiosity
Maesaroh et al. (2024)

Jki

religion, the influence of religion on consumer behavior can differ depending on the level of religiosity or religious commitment (Hassan & Harun, 2016).

> H4: Religiosity has a positive effect on attitudes towards halal destination development.

Sudarsono et al. (2021) placed religiosity as a moderating variable that can influence a person's intensity in behaving toward an attitude object. In the context of HT, religiosity plays a moderating role in the influence of attitudes towards HT attributes on attitudes towards HT destination development (Figure 1). Someone who has a positive attitude towards HT attributes will have a positive attitude towards HT destination development; only their level of agreement will differ, depending on their level of religiosity.

> H5: Religiosity moderates the effect of attitudes towards HT attributes on attitudes towards halal destination development.

Figure 1. Conceptual Model
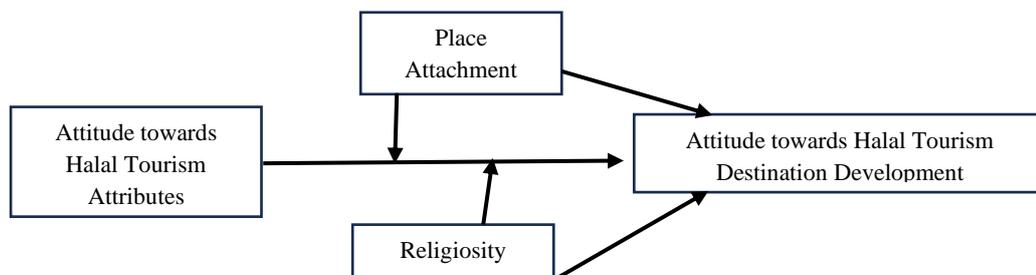Source: Author analysis, 2023

METHODOLOGY

This study is quantitative research. Data collection was conducted at a certain time so that the data collected were cross-sectional. Data collection was conducted in September 2023. The study population included all domestic tourists who have visited the Special Region of Yogyakarta. The sample was purposively selected with a minimum age of 17 years and the last visit to DIY within no more than two years. Before being used in the main study, the questionnaire was distributed to 30 respondents to test its validity and reliability. After several improvements related to wording were made, the questionnaire was distributed to obtain target respondents.

The total number of participants was 335. Based on Sekaran (2006), a sufficient number of samples was 30-500. Meanwhile, based on Hair et al. (2019), the minimum sample size was five times the number of items in the questionnaire. Because this questionnaire contained 40 items, the minimum sample size was 200. The online questionnaire was distributed snowballing via WhatsApp Groups to obtain the target respondents. In total, 358 filled questionnaires were sent to the researchers. However, after rechecking, 23 questionnaires were deemed unfit and were not used in the research.

The instruments in this research are based on measurements developed and used in previous research. Specifically, for the attributes of HT destinations, criteria such as those

developed by CrescentRating are used by adopting conditions that are specific criteria for HT destinations. In this case, CrescentRating developed three groups of criteria: Need to have, Good to have, and Nice to have.

The measurement of place attachment was developed by adapting the measurement used by Kyle et al. (2004), Moore and Graefe (1994), and Vaske and Kobrin (2001). Meanwhile, for religiosity, a measurement consisting of five items was adopted from the research of Sudarsono et al. (2021). Attitudes towards attributes and Attitudes towards the development of HT destinations were adapted and contextualized from measurements developed in marketing and tourism literature (Dewi, 2023; Eagly & Chaiken, 1993; Keller, 1993). All of the measurements are depicted in Table 2.

Responses were scored on a scale ranging from strongly disagree (1) to strongly agree (5). The data were analyzed using Structural Equation Modeling-Partial Least Square (SEM-PLS). PLS-SEM is well suited for the current research to understand the relationship between the variables. This analytical tool provides a reliable and adaptable method for testing causal models (Danks et al., 2020; Hair et al., 2020). PLS-SEM has also relatively few limits on data and measurement scales (Hair et al., 2019).

FINDINGS AND DISCUSSION

The characteristics of 355 respondents are listed in Table 1. In terms of gender, age, visit status, educational background, and place of residence, respondents were distributed quite evenly. The descriptive statistics of the means for each variable are presented in Table 1. Table 2 presents the results of the validity and reliability tests. The results showed that the instrument met validity and reliability requirements. Convergent validity is shown by factor loadings and Average Variance Extracted (AVE), and internal consistency was assessed using Cronbach's Alpha and Composite Reliability (CR) scores.

Table 1. Respondents' Profile

Descriptor	Number (%)	Descriptor	Number (%)
Gender		**Visit Status**	
Male	170 (47.88)	First Visit	31 (8.7)
Female	185 (52.11)	2nd -3rd time	113 (31.83)
		4th – 5th time	142 (40)
		Regular visit	69 (19.43)
Age group		**Educational background**	
17 – 25 y.o	37 (10.42)	Primary School	1 (0.3)
26 – 35 y.o	144 (40.56)	Junior High School	21 (5.9)
36 – 45 y.o	116 (32.68)	Senior High School	149 (41.97)
46 – 55 y.o	45 (12.68)	Undergraduate	161 (45.35)
>55 y.o	13 (3.66)	Post Graduate	23 (6.48)
Place of residence		**Family expenditure/month**	
East Java	46 (12.96)	< IDR 2.5 million	22 (6.19
West Java	21 (5.91)	IDR 2.5 – 5 million	97 (27.32
Central Java	156 (43.94)	IDR 5.1 – 10 million	149 (41.97)
Jakarta Special Region	87 (24.50)	IDR >10 million	87 (24.50)
Banten	24 (6.76)		
Outside Java Island	21 (5.92)		

Source: primary data analysis, 2023

Attitudes Towards Halal Tourism Development: The Roles of Place Attachment and Religiosity
Maesaroh et al. (2024)

Jki

It is important to note that 2 (two) measurement items of attitude towards HT attributes (ATR 10 and ATR 12) showed slightly low factor loadings (<0.70). However, because these attributes belong to the criteria of HT according to Crescent Ratings, we decided to include the items. Following the suggestions of Vinzi et al. (2010), we should not directly consider an item if its loading is less than 0.70. Instead, we should check whether deleting the item significantly improves Composite Reliability (CR) and Average Variance Extracted (AVE). Since deleting the items did not improve CR and AVE, and the existing CR and AVE scores were acceptable, we decided to retain the items. Table 3 presents the cross-loading of the items. All the items were loaded onto the intended factors. These results indicated the discriminant validity of the instruments. All the criteria were fulfilled based on these results.

Table 2. Validity, Reliability, and Mean Values

	Measurement item	**Loading**	**AVE**	**Cronbach's Alpha**	**CR**	**Mean**
Attitude towards HT Attributes			0.525	0.886	0.815	4.188
ATR1	Tour packages pay attention to schedules and facilitate five-time daily prayers	0.640				4.576
ATR2	Tourist facilities provide food during fasting and breaking the fast during Ramadan	0.626				4.313
ATR3	It provided a tourism experience that connects tourists with Islamic identity and history/heritage.	0.746				4.224
ATR4	Visits and tours to Islamic historical/heritage sites	0.765				4.200
ATR5	Tour packages that facilitate interaction with the local Muslim community	0.792				4.084
ATR6	Get experience in tourist destinations accompanied by a Muslim tour guide	0.762				3.979
ATR7	Tourist spaces that provide privacy/separate spaces for women and men	0.689				3.934
ATR8	A swimming pool that provides privacy/separate pools for women and men	0.748				4.155
ATR9	A beach that provides separate privacy for women and men	0.635				3.642
ATR10	Spa and beauty salon that provides privacy/separate space for women and men	0.516				4.361
ATR11	Tourist facilities that do not provide alcohol at all	0.607				4.301
ATR12	Tourist facilities that are not connected to gambling facilities	0.545				4.487
Religiosity			0.817	0.925	0.902	3.982
R1	I try to follow the commands of Islam in every aspect of my life	0.923				4.012
R2	I always try to avoid small and big sins as guided by my religion	0.946				3.967
R3	I have a belief that all ideological dimensions are based on Islam	0.891				3.931

	Measurement item	Loading	AVE	Cronbach's Alpha	CR	Mean
R4	I always find out anything related to the teachings of my religion	0.853				4.048
Place Attachment			**0.694**	**0.870**	**0.898**	**4.319**
PA1	I have a special relationship with this place (Yogyakarta)	0.821				4.310
PA2	Yogyakarta represents a lot about who I am	0.937				4.355
PA3	I feel Yogyakarta is part of me	0.918				4.224
PA4	I will not substitute Yogyakarta with other destinations	0.717				4.385
Attitudes towards HT Destination			**0.640**	**0.757**	**0.947**	**3.586**
ATT1	I agree with the development of Halal Tourism in Yogyakarta	0.745				3.824
ATT2	I support Yogyakarta as a halal tourism destination	0.752				3.466
ATT3	It is favorable for Yogyakarta to become a Halal Tourism destination	0.741				3.487
ATT4	Developing Yogyakarta as a halal tourism destination is a good idea	0.756				3.570

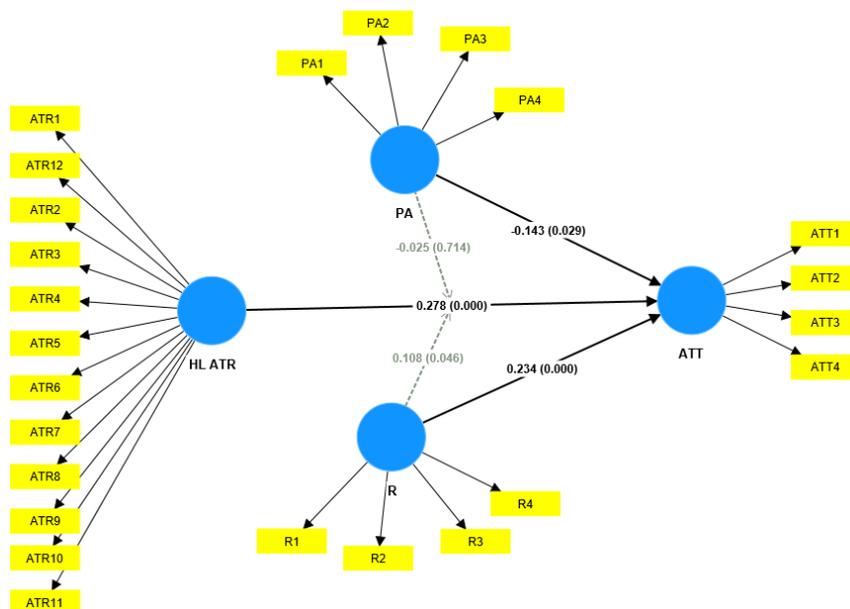Source: primary data analysis, 2023

Table 3. Cross Loadings

	ATT	HL ATR	PA	R	R x HL ATR	PA x HL ATR
ATR1	0.088	0.640	0.049	0.163	-0.020	0.150
ATR2	0.091	0.626	0.036	0.193	0.016	0.128
ATR3	0.250	0.746	0.079	0.181	0.122	0.083
ATR4	0.230	0.765	-0.009	0.212	0.078	0.151
ATR5	0.287	0.792	0.027	0.168	0.089	0.159
ATR6	0.296	0.762	-0.067	0.288	0.091	0.155
ATR7	0.287	0.689	0.043	0.248	0.096	0.149
ATR8	0.265	0.748	0.029	0.250	0.044	0.207
ATR9	0.273	0.635	0.024	0.225	0.155	0.189
ATR10	0.061	0.516	0.088	0.220	0.031	0.090
ATR11	0.235	0.607	0.032	0.237	-0.069	0.193
ATR12	0.177	0.545	0.025	0.235	-0.186	0.167
ATT1	0.745	0.398	-0.097	0.364	0.100	0.113
ATT2	0.752	0.171	-0.138	0.116	0.053	0.023
ATT3	0.741	0.148	-0.095	0.156	0.065	0.000
ATT4	0.756	0.116	-0.077	0.152	0.081	0.009
PA1	-0.045	0.082	0.821	-0.059	0.059	-0.073
PA2	-0.149	0.040	0.937	-0.082	0.107	-0.040
PA3	-0.138	0.002	0.918	-0.073	0.121	-0.027
PA4	-0.018	0.005	0.717	-0.026	0.077	-0.054
R1	0.307	0.260	-0.091	0.923	-0.065	0.105
R2	0.299	0.279	-0.070	0.946	-0.026	0.122
R3	0.289	0.284	-0.069	0.891	-0.022	0.103
R4	0.291	0.354	-0.062	0.853	-0.049	0.150

Attitudes Towards Halal Tourism Development: The Roles of Place Attachment and Religiosity
Maesaroh et al. (2024)

Jki

	ATT	HL ATR	PA	R	R x HL ATR	PA x HL ATR
PA x HL ATR	0.077	0.229	-0.044	0.132	-0.007	1.000
R x HL ATR	0.110	0.077	0.117	-0.045	1.000	-0.007

Source: primary data analysis, 2023

It is important to note that 2 (two) measurement items of attitude towards HT attributes (ATR 10 and ATR 12) showed relatively low factor loadings (<0.70). However, because these attributes belong to the criteria of HT according to Crescent Ratings, we decided to include the items. Following the suggestions of Vinzi et al. (2010), we should not directly consider an item if its loading is less than 0.70. Instead, we should check whether deleting the item significantly improves Composite Reliability (CR) and Average Variance Extracted (AVE). Since deleting the items did not improve CR and AVE, and the existing CR and AVE scores were acceptable, we decided to retain the items. Table 3 presents the cross-loading of the items. All the items were loaded onto the intended factors. These results indicated the discriminant validity of the instruments. All the criteria were fulfilled based on these results.

Figure 2. Structural Model
Source: primary data analysis, 2023

The structural model is illustrated in Figure 2. The magnitude of the influence of each variable on the other variables and the moderating role of religiosity and place attachment are shown in the structural model. Table 4 presents the original sample, standard deviations, t-statistics, and p-values. Based on these results, hypothesis testing showed that attitudes towards HT attributes had a positive effect on attitudes towards HT destination development (B = 0.278; p = 0.000). Thus, H1 is supported. The results also showed that place attachment had a positive effect on attitudes towards HT destination development (B = -0.143, p = 0.029). This implies that H2 is supported. Place attachment does not play a moderating role in the influence of attitudes towards HT attributes on attitudes towards HT destination development (B = -0.025, p = 0.366). Hence, H3 is not supported. Religiosity also had a positive effect on attitudes towards HT destination development (B = 0.234, p =

69

0.000). In addition, the role of religiosity as a moderating influence of attitude towards HT attributes on attitude towards HT destination development was also supported (B = 0.108, p = 0.046. Therefore, H5 is supported.

Table 4. Results of Hypothesis Testing

	Relationship	Original sample	Standard deviation	T statistics	P values	Conclusion
H1	HL ATR -> ATT	0.278	0.056	4.994	0.000	H1 is supported
H2	PA -> ATT	-0.143	0.066	2.182	0.029	H2 is supported
H3	PA x HL ATR -> ATT	-0.025	0.067	0.366	0.714	H3 is not supported
H4	R -> ATT	0.234	0.058	4.028	0.000	H4 is supported
H5	R x HL ATR -> ATT	0.108	0.054	1.993	0.046	H5 is supported

Source: primary data analysis, 2023

Based on the fitness model indicators, this structural model had an adequate fit index. The model showed adequate fit. (standardized root mean square residual) score of the model was 0.086. SRMR is a goodness-of-fit measure for PLS-SEM to avoid model misspecification (Henseler et al., 2014; Schermelleh-Engel et al., 2003). Hu and Bentler (1998) stated that a good fit is indicated by an SRMR score of less than 0.10. The Normed Fit Index of (current) was 0.728. It showed an incremental fit. However, since Smart PLS does not provide a better measure of model fitness of the non-normed fit index (NNFI) (Lohmöller, 1989), we assessed that the fitness of the model is adequate.

This research shows that developing a tourist destination requires a multi-perspective approach. Especially in developing an HT destination, an understanding of the characteristics or requirements of a destination that meets the criteria as an HT destination is crucial. Second, it requires an understanding of the characteristics of tourists who visit the destination, namely the relationship between tourists and the destination and the level of tourists' psychographic characteristics.

In this research, 3 (three) aspects that can influence attitudes toward HT destination development were integrated. The first perspective is from the destination factor, namely, by including the attributes that become HT criteria. Tourists' attitudes towards these attributes are an important perspective that can show their approval of these attributes. Furthermore, this attitude influences tourists' attitudes towards HT destination development. The second relates to tourists' attachment to a place. This is important because tourist destinations involve geographic units. The third perspective is the characteristics of tourists themselves, namely, religiosity. About the development of HT, this characteristic of religiosity is relevant for integration into the model.

The descriptive data from this study provide interesting insights as well. The average score of respondents' attitudes regarding the attributes of HT destinations shows that tourists' attitudes can be different towards each of these attributes. For example, the halal tourist destination attributes that require separate facilities for men and women (attribute number 7 and number 9) received the lowest scores, that is, 3.642 and 3.934 respectively.

Further, the results show that attitude towards the HT attribute has a positive effect on attitude towards HT destination development. These results confirm the attribute-based attitude theory (Fishbein & Ajzen, 1975) that agreement with attributes will have a positive

Attitudes Towards Halal Tourism Development: The Roles of Place Attachment and Religiosity
Maesaroh et al. (2024)

Jki

effect on the overall attitude towards HT destination development. This influence is strengthened by tourists' religiosity. These results support the opinions of Sudarsono et al. (2021) and He and Tian (2023) that commitment to religion will be seen in cognitive and behavioral aspects. In other research models (Sudarsono et al., 2021) religiosity is placed as a moderating variable, and this research produces a new perspective. In other words, religiosity can have a direct influence on attitudes towards HT destination development. In addition, religiosity can strengthen the influence of attitudes towards HT attributes on attitudes towards HT destination development. This shows that tourists' characteristics are very important in determining their attitudes towards the development of a tourist destination. The influence of religiosity on attitudes towards HT destination development is also high, greater than the influence of other variables (i.e., place attachment). Even though formally the respondents were Muslims, this research supports the opinion of Hassan and Harun (2016) that respondents have different levels of religiosity. As argued by (Hassan & Harun, 2016), a Muslim's attitude toward HT destination development also needs to be examined from his/her religiosity.

This research provides fresh insight from a place attachment perspective. Attitudes towards HT destination development are also influenced by a person's relationship with the destination. In this research, a destination (Yogyakarta) was specifically mentioned in the questionnaire to measure tourists' place attachment. The results of this study indicate that place attachment does not moderate the influence of attitudes towards HT attributes on attitudes towards HT destination development. Although there are indications that place attachment weakens the relationship between these two variables, the results are not significant. However, the research results showed a direct influence of place attachment on attitudes toward HT destination development. This implies that the influence of tourists' attitudes towards halal tourism attributes on their attitudes towards the development of a destination to become an HT destination will depend on their relationship to the destination. In other words, even though a tourist agrees with the attributes of HT as advised by Crescent Rating, he may not agree that a destination should be developed into an HT destination. Tourists can perceive that a destination is more appropriate to be developed as an HT destination than other destinations.

Theoretically, the results of this study strengthen place attachment theory (Bricker & Kerstetter, 2000; Brown & Raymond, 2007; Jorgensen & Stedman, 2001; Kaltenborn, 1997) which underlines the importance of one's attachment to a place in shaping his/her agreement with the development direction of the place he/she likes. The results of this research show that place attachment between an individual and Yogyakarta has a negative effect on attitudes towards HT destination development in Yogyakarta. This may contain concerns about changes that will be unfavorable or reduce the tourism experience in Yogyakarta if it is developed into an HT destination based on the criteria stated by the Crescent Rating. Research by Dewi (2023) provides a partial explanation, namely that place attachment must be examined further by adding perceived benefits and concerns that tourists have regarding certain development ideas in certain places. By including both religiosity and place attachment in the model, this research offers interesting findings that religiosity has a stronger influence on the formation of attitudes towards HT destination development. Previous studies have only focused on aspects of tourist characteristics, so they could not compare the role of tourist characteristics with tourist-destination relations.

CONCLUSION

This research concluded that attitudes towards HT destination development are influenced by three factors: 1) attitude towards HT attributes, 2) religiosity of tourists, and 3) place attachment of tourists to the destination. The role of religiosity in forming attitudes towards HT destination development occurs directly, as well as a moderator between attitudes towards HT attributes and attitudes towards HT destination development. Meanwhile, the role of place attachment in forming attitudes towards HT destinations has a direct influence.

This study provides implications for further research and policymaking. There are several limitations to this study that need to be followed up with further research. Place attachment still only limits this variable as a unidimensional variable. Place attachment theory states that place attachment has multiple dimensions, namely, functional and emotional (Dewi, 2023; Oh et al., 2012). If place attachment is differentiated into these two dimensions, the relationship between tourists and a destination will be better understood. Moreover, if this variable is linked to tourists' religiosity, it will be possible to compare the influence of the emotional and functional aspects of place attachment with religiosity on attitudes towards HT destination development.

As a more comprehensive model, future research can further analyze the differences in attitudes based on tourist demographic characteristics. Religious and generational differences may be used as a basis for conducting multigroup analyses. In addition, behavioral analysis, such as visit status, can also be a basis for further exploring its impact on tourists' relationships with destinations. In this study, most respondents were visitors who had visited Yogyakarta more than twice. The attitudes of first-time visitors may differ. Furthermore, the intention to revisit a destination can provide further insight into the impact of attitude on tourists' behavior.

This research can be followed up with qualitative research. Qualitative research using a phenomenological approach can enrich quantitative research. The interview results can be analyzed using hermeneutics interpretation to further explore tourists' attitudes towards halal tourism beyond the attributes that have been developed by Crescentrating.

This study provides important insights for public policymaking. The development and determination of HT destinations can be approved and rejected by different destinations. Tourists can respond differently to the development of HT destinations. In making these policies, tourists' opinions must be considered when developing a tourist destination. The results of this research also provide practical implications in that the development of HT requires clear attribute-based guidelines. As stated by (Said et al., 2022; Yan et al., 2017), to avoid misunderstandings, both the tourism industry and government need specific criteria and guidelines for developing HT destinations. Therefore, the authority of tourism development should formulate a clear and unambiguous definition and criteria for HT destinations.

Attitudes Towards Halal Tourism Development: The Roles of Place Attachment and Religiosity
Maesaroh et al. (2024)

Jki

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SUSTAINABLE STRATEGY, RISK MANAGEMENT, AND FINANCIAL PERFORMANCE OF TOURISM OPERATORS

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Article Info	Abstract
	The primary purpose of writing this paper is to empirically demonstrate the role of risk management in mediating the relationship between sustainable strategies and the financial performance of tourism operators comprising hotels, homestays, restaurants, and cafes. Researchers distributed a set of questionnaires to tourism operators in Indonesia and obtained two hundred and fifty respondents. Data was analyzed using Structural Equation Modeling - Partial Least Square (SEM PLS). The statistical tool employed is WarpPLS version 7.0. The first finding of the research is that sustainable strategies have a significant positive impact on the sustainable financial performance of tourism operators. Second, a sustainable approach has a significant positive effect on risk management. Third, risk management has a significant positive impact on the sustainable financial performance of tourism operators. The main discovery of this research is that risk management successfully serves as a mediator in the relationship between sustainable strategies and the financial performance of tourism operators.

INTRODUCTION

In recent times, the issue of sustainability has become a widespread topic of discussion worldwide. According to the United Nation World Tourism Organization (UNWTO) report (UNWTO, 2022), the development of sustainable practices in the tourism sector has gained global attention, especially during the pandemic. (UNWTO, 2023b) reported that the growth of The Environmental Performance Index (EPI) in 2020 reached 81% and continued to increase until the end of the pandemic. Several pieces of literature indicate a significant increase in sustainability research since 2019 (Ellili, 2022; Gao et al., 2021; Li et al., 2023; Senadheera et al., 2022; Wan et al., 2023). Thus, the evolving discourse on sustainability and sustainable development in the tourism sector is expected to impact the financial performance of tourism operators.

According to the UNWTO (2022), sustainable strategy comprises three main components: economic, social, and environmental. The UNWTO report (UNWTO, 2023a) suggests that ecological strategy is crucial in improving sustainability performance in Indonesia. Based on this report, Indonesia produces 3.5% of solid waste and 2.03% of wastewater discharged into the sea. Previous research indicates that economic practices can influence financial performance (Domi et al., 2019; Pan et al., 2018; Sainaghi et al., 2017). Simultaneously, social practices undertaken by tourist destinations can also affect financial performance (Bagur-Femenías et al., 2015; de Grosbois, 2016; Ooi et al., 2015). Other studies find that environmentally friendly practices enhance financial performance (Claver-Cortés et al., 2007; Elkhwesky, 2022; Tan et al., 2017). So, each practice within sustainable strategy positively impacts the improvement of the financial performance of tourist destinations.

On the other hand, sustainable strategy only sometimes impacts all sub-sectors within the tourism sector (Uyar et al., 2020). For instance, implementing a sustainable strategy may be ineffective in improving financial performance in the hotel sector (Bagur-Femenías et al., 2015). Some even argue that a sustainable strategy negatively affects financial performance (Pulido-Fernández et al., 2015). Furthermore, this negative effect arises due to a high potential for fraud (Theodoulidis et al., 2017). Tarjo et al. (2023) reported a high potential for fraud in the Indonesian tourism sector. Therefore, the potential for fraud is a daunting threat to tourism operators, as it can jeopardize the performance and sustainability of tourist destinations.

Pearce (2011) stated that tourist scams are a disturbing fraud for destinations. Tourist scams can damage the life and survival of tourist destinations (Xu et al., 2022). From the theoretical perspective of Sunarti et al. (2020), risk management plays a vital role in preventing tourist scams in the tourism sector. The existence of risk management in tourist destinations can be a strategy to avoid risks that have the potential to occur now and in the future, including the risk of tourist scams (Kassem & Santamaria, 2023). Other research proves that risk management can guarantee the survival of tourist destinations and ensure that destinations avoid tourist scams (Ouyang et al., 2020). Thus, risk management provides various benefits for tourist destinations, such as preventing scams and future risks.

Another view reveals that sustainable strategies drive better financial performance due to mediating factors such as improved risk management and more innovation (Whelan et al., 2021). Atz et al. (2021) said that risk management can be a mediator to improve financial performance. Vishwanathan et al. (2020) stated that having a risk management

Sustainable Strategy, Risk management, and Financial Performance of Tourism Operators
Tarjo et al. (2024)

Jki

concept can improve tourism operators' financial performance. So, risk management has a vital role in improving the financial performance of tourism operators and can also be a mediator for sustainable strategies and the financial performance of tourism operators.

Based on previous arguments, this research uses risk management as a mediating variable, which refers to several studies that say that sustainable strategy should play a role in risk management (Kim et al., 2021; Roxas et al., 2020; Sainaghi et al., 2017; Torres-Delgado et al., 2023). Meanwhile, risk management can assist tourism operators in enhancing their performance (Bhatti & Nawaz, 2020; Mandal & Dubey, 2020). Some studies even consider risk management as a mediator for sustainable strategy (Kuo et al., 2021). Some researchers have developed models in which risk management serves as a mediator for sustainable strategy and the performance of tourist destinations (Roe et al., 2014). Lastly, Whelan et al. (2021) developed a model using risk management as a mediator for sustainable strategy and financial performance. However, it has yet to be studied empirically. Thus, a sustainable strategy has another function: supporting risk management. Improved performance in risk management within an organization can help improve the performance of tourist destinations. Based on this rationale, the researcher develops a second model, where sustainable strategy indirectly influences destination performance through risk management.

This study aims to empirically examine the role of sustainable strategy in risk management and, ultimately, its influence on the financial performance of tourism operators. The research gap lies in the ongoing debate between studies that support and oppose the relationship between sustainable strategy and sustainable performance. Apart from that, few researchers are still sensitive to the potential for fraud and the importance of risk management for the tourism sector in Indonesia (Sunarti et al., 2020). Whelan et al. (2021) stated that applying risk management as a mediator for sustainable strategy and the financial performance of tourism operators in the tourism sector has yet to be empirically proven. Therefore, the novelty of this research lies in adding mediating variables to the relationship between sustainable strategy and the financial performance of tourism operators. The researcher hopes to investigate the association between the two variables by including a mediating variable based on this gap. Risk management serves as the study's mediating variable. The model Roe et al. (2014) created served as the foundation for the decision to use risk management as a mediator. As a result, this study empirically builds upon earlier research.

According to the UNWTO (2022), the tourism industry includes sustainable strategy ideas: economic, social, and environmental aspects. Economic refers to financial innovation, entrepreneurial spirit, profit, etc. Social refers to a destination's efforts to improve the well-being of employees and society and provide employment opportunities. Environmental concerns involve a company's efforts to preserve and sustain the surrounding environment and avoid pollution from tourism destination operations.

Theoretically, the implementation of sustainable strategies by destinations aligns with the improvement of financial performance in tourism destinations (Hamid et al., 2021). In Indonesia, sustainable strategy practices can positively impact the financial performance of Indonesian tourist destinations (Achmad & Yulianah, 2022; Fatina et al., 2023; Firman et al., 2023; Hermawan et al., 2023; Nugroho et al., 2023; Utami et al., 2023). Additionally, economic (Domi et al., 2019; Pan et al., 2018; Sainaghi et al., 2017), social (Bagur-Femenías et al., 2015; de Grosbois, 2016; Ooi et al., 2015), and environmental

practices (Claver-Cortés et al., 2007; Elkhwesky, 2022; Tan et al., 2017) enhanced the financial performance of tourism operators.

Based on the arguments above, a sustainable strategy aims to ensure that tourism operators can improve and sustain their performance over time. The objective aligns with the stakeholders' desire that economic, social, and environmental practices can enhance stakeholder well-being. Tourism operators can continually boost their sustainable performance by actively implementing sustainable strategies. Hence, this research develops the following hypotheses:

H1: (a) Economic, (b) social, and (c) environmental have a significantly positive influence on the financial performance of tourism operators.

The primary goal of a sustainable strategy is to ensure that tourism operators can endure for as long as possible (UNWTO, 2022). The goal must be accompanied by efforts to prevent fraud. The sustainable strategy must integrate with risk management as one of the measures to prevent fraud. Kim et al. (2021) study argues that implementing risk management can leverage sustainable strategy. Sustainable strategies are essential for improving risk management (Roxas et al., 2020). Sainaghi et al. (2017) explain that the economic component can improve risk management because accounting functions within economics and serves as risk management. Torres-Delgado et al. (2023) found that a sustainable strategy can function in assessing risks in tourism operators, including fraud. Schulte and Knuts (2022) explained that a sustainable strategy can increase risk awareness so that stakeholders implement risk management.

Based on these arguments, a sustainable strategy can be a way to assess risks for tourism operators. Furthermore, the economic element in sustainable strategy plays a vital role in ensuring the functioning of risk management. Theoretically, improving risk management can prevent fraud, alleviate stakeholder concerns, and ensure stakeholder happiness. This research develops the following hypotheses:

H2: (a) Economic, (b) social, and (c) environmental have a significantly positive influence on risk management.

Risk management assesses every risk within an organization (Tarantino, 2008). This function also reduces the potential for fraud. One of the terrible frauds for tourist destinations and tourists is tourist scams (Pearce, 2011). Sunarti et al. (2020) suggest implementing risk management to prevent tourist scams. Reducing the risk of tourist scams refers to the high potential for fraud in tourist destinations (Tarjo et al., 2023). The decrease in the risk of fraud will enhance the financial performance of tourist destinations (Bhatti & Nawaz, 2020). Mandal and Dubey (2020) research suggests that risk management positively influences the improvement of financial performance in tourism operators.

Thus, risk management ensures that potential fraud and fraudulent practices protect tourism operators. The reduction of fraud among tourism operators undoubtedly satisfies stakeholders. Additionally, risk management can enhance sustainable performance. The benefit leads to improved performance and increased stakeholder well-being. Consequently, the present study formulates the subsequent hypothesis:

Sustainable Strategy, Risk management, and Financial Performance of Tourism Operators
Tarjo et al. (2024)

Jki

H3: Risk management has a significantly positive influence on the financial performance of tourism operators.

A sustainable strategy represents a company's efforts to execute economic, social, and environmental sustainability functions (UNWTO, 2022). They are interrelated and enhance the financial performance of tourist destinations (González-Rodríguez et al., 2019; Madanaguli et al., 2022). Specifically, economics focuses on how companies increase their profits (Domi et al., 2019; Pan et al., 2018; Sainaghi et al., 2017). Furthermore, a company's efforts to improve employee and community well-being constitute social (Bagur-Femenías et al., 2015; de Grosbois, 2016; Ooi et al., 2015). Finally, environmental preservation and innovation efforts constitute practices of the environmental component (Claver-Cortés et al., 2007; Elkhwesky, 2022; Tan et al., 2017). Thus, sustainable strategy significantly positively influences financial performance.

On the other hand, in applying environmental strategy to the dark side, as Tarjo et al. (2022) explained, the potential for fraud causes a decline in the performance of the sustainable strategy. Ly et al. (2022) found many tourist scams in tourist destinations, causing damage to social welfare. Pearce (2011) states that tourist scams are very detrimental to tourist destinations and visitors, especially economically. Ouyang et al. (2020) suggest that tourist destinations implement risk management to prevent tourist scams and increase their sustainability.

Companies must leverage sustainable strategy to improve risk management performance (Kim et al., 2021) and as a means of risk assessment (Sainaghi et al., 2017). Risk management will undoubtedly enhance financial performance (Bhatti & Nawaz, 2020; Mandal & Dubey, 2020). Thus, risk management significantly positively influences the financial performance.

Meanwhile, some researchers suggest that risk management becomes a mediator for sustainable strategy and financial performance (Kuo et al., 2021). Research by Atz et al. (2021) developed a concept where risk management can be a mediating variable and is suitable for improving the financial performance of tourism operators. Studies have even produced models claiming risk management might mediate between sustainable strategy's effects on financial performance (Roe et al., 2014; Whelan et al., 2021). From the stakeholder theory perspective, sustainable strategy becomes one of the means to improve stakeholders' well-being. Sustainable strategy and risk management can enhance financial performance, and sound financial performance can satisfy stakeholders. Based on this theory, sustainable strategy significantly influences risk management, and risk management can significantly and positively influence financial performance. Thus, this research develops the following hypotheses:

H4: (a) Economic, (b) social, and (c) environmental indirectly influences the financial performance of tourism operators through risk management.

METHODOLOGY

The population of this research includes all tourism operators in Indonesia. The selection of tourism operators and village tourism is based on recommendations from UNWTO and previous research. According to a report by UNWTO (2022), Indonesia has

Jki

the world's best natural (water) management. UNWTO has recognized the water and nature tourism field in Indonesia as one of the best sustainable operators in the world (UNWTO, 2022). Based on this report, researchers used tourist destinations in the form of natural tourism.

Natural tourism destinations are the target of this research. The sample selection technique uses purposive sampling. The criteria for the research sample are as follows:
1. Natural tourism operators in Indonesia.
2. Respondents selected are managers of tourism operators in hotels, homestays, restaurants, and cafes.

Researchers distributed 300 questionnaires to 29 tourist destinations in Madura and Lombok. However, only 250 were completed, with details: Restaurant managers, 63 respondents; Cafe managers, 100 respondents; Hotel Managers, 42 respondents; and Homestay managers, 45. The following Table 1 is the research sample:

Table 1. Research Sample and Respondent Characteristics

Description	Sample
Questionnaires distributed	300
Returned questionnaires	250
Total sample	**250**
Restaurant managers	63
Cafe manager	100
Hotel Manager	42
Homestay manager	45
Gender	
Male	136
Female	114

Source: authors primary data, 2023

This research uses data from questionnaire distribution and consists of values from each question in the questionnaire. Statements regarding the sustainability performance of tourism operators will be taken from the study (Luo, 2018). Sustainable performance consists of four main components: economic, efficiency, effectiveness, and the environment, often called 4E. The economic component focuses on recording income and expenses incurred by tourism operators. The efficiency component refers to the number of visitors and travel data to tourism operators. The effectiveness component refers to facilities and complaints from visitors. The environment component discusses environmental impact. Thus, the number of statements for sustainable performance is six questions.

Sustainable strategy focuses on three components: economic, social, and environmental (UNWTO, 2022). Questions for sustainable strategy consist of fourteen questions: five for economic, five for social, and four for environmental. Risk management refers to risk assessment and response to these risks (Becken & Hughey, 2013; Oulasvirta & Anttiroiko, 2017). For risk management, the researcher uses six questions. The Likert scale for all questions is from one (strongly disagree) to five (strongly agree).

The data analysis method uses SEM-PLS with the help of the WarpPLS application. The initial stage for SEM-PLS testing is to test the outer model which refers to the validity and reliability tests (Kock, 2021). The validity test consists of convergent validity and discriminant validity. Discriminant validity uses the loading factor value and

Sustainable Strategy, Risk management, and Financial Performance of Tourism Operators
Tarjo et al. (2024)

Jki

Average Variance Extracted (AVE). The value limit for the loading factor is 0.7 while the AVE is 0.5. Discriminant validity uses the square root value of AVE with the condition that this value must be greater than the correlation value between constructs. Meanwhile, the reliability test uses the composite reliability value with a value limit of 0.7 and Cronbach's alpha of 0.6 (Kock, 2021).

The second stage of SEM-PLS testing is the inner model. The inner model test consists of four tests, i.e., goodness of fit model, R-square, Q-square, and path coefficient (Kock, 2021). The goodness of fit model ensures that the model used is fit or not based on ten types of tests. The R-square tests how much chance future research and the Q-square is to see how accurate the developed model is. The path coefficient test is the main reference for making research hypothesis decisions (Kock, 2021). The research design is as follows in Figure 1:
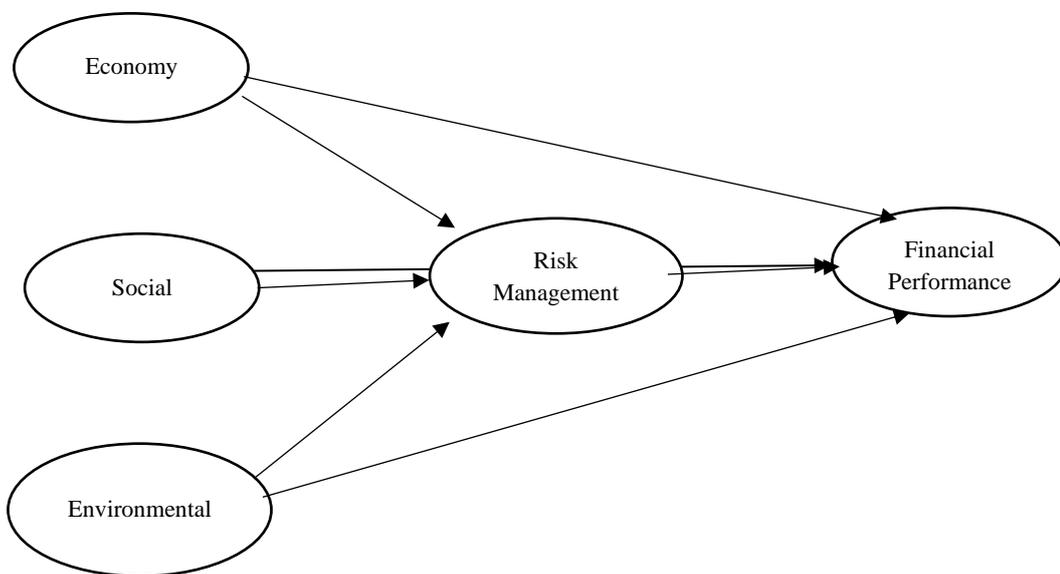
Figure 1. Research Model
Source: authors analysis, 2023

FINDINGS AND DISCUSSION

Outer Model

Kock (2021) stated that the outer model consists of convergent validity, discriminant validity, composite reliability, and Cronbach's alpha. Convergent validity is tested based on the loading factor values (with an alpha value of 0.7) and Average Variance Extracted (AVE) (with an alpha value of 0.5). Based on the testing presented in Table 2, it is evident that all questions have loading factors more significant than the alpha value. In the AVE test, the results show a similar outcome, with the AVE values being more significant than alpha. The researcher presents Table 2 as follows:

Table 2. Convergent Validity and Reliability Test

Variable	Question	Loading Factor	AVE	CR	CA
Economy	Eco1	(0.821)	0.702	0.922	0.894
	Eco2	(0.866)			
	Eco3	(0.870)			
	Eco4	(0.838)			

	Eco5	(0.792)			
Social	Soc1	(0.859)	0.786	0.948	0.932
	Soc2	(0.901)			
	Soc3	(0.880)			
	Soc4	(0.906)			
	Soc5	(0.885)			
Environment	Env1	(0.849)	0.765	0.929	0.898
	Env2	(0.884)			
	Env3	(0.904)			
	Env4	(0.861)			
Risk Management	RisM1	(0.830)	0.718	0.938	0.921
	RisM2	(0.833)			
	RisM3	(0.827)			
	RisM4	(0.846)			
	RisM5	(0.895)			
	RisM6	(0.850)			
Financial Performance	FP1	(0.838)	0.662	0.921	0.897
	FP2	(0.824)			
	FP3	(0.738)			
	FP4	(0.822)			
	FP5	(0.819)			
	FP6	(0.836)			

Source: processed using WarpPLS version 7, 2023

Discriminant validity test uses the square root of AVE values. The requirement for discriminant validity is that the square root of AVE values must be greater than the inter-construct values (Kock, 2021). In Table 3 shows the results of the discriminant validity test indicating that the square root of AVE values is substantial. This outcome serves as evidence that the criteria for discriminant validity are met. Below are the findings from the discriminant validity test:

Table 3. Discriminant Validity

	Eco	RisM	FP	Soc	Env
Eco	(0.838)	0.604	0.586	0.138	0.672
RisM	0.604	(0.847)	0.555	0.239	0.591
FP	0.586	0.555	(0.834)	0.240	0.509
Soc	0.138	0.239	0.240	(0.717)	0.169
Env	0.672	0.591	0.509	0.169	(0.875)

Note:"()" is square root AVEs
Source: processed using WarpPLS version 7, 2023

Lastly, Cronbach's Alpha and the Composite Reliability test executes the reliability test. The composite reliability test has an alpha threshold 0.7, while the Cronbach's alpha requirement is 0.6. The values of all the variables in Table 1's CR (composite reliability) column are more than 0.7. On the other hand, each variable's value is >0.6 in the CA column, which forms the foundation for Cronbach's alpha test. As a result, all requirements for Cronbach's alpha, composite reliability, discriminant validity, and convergent validity tests have been satisfied.

Sustainable Strategy, Risk management, and Financial Performance of Tourism Operators
Tarjo et al. (2024)

Jki

Inner Model

After achieving the criteria for the outer model, the next stage is the inner model. According to Kock (2021), the goodness of fit model, R-square, Q-square, and path coefficient are the four tests that build the inner model. Based on the testing presented in Table 4, the goodness of fit model comprises ten tests. The research model is appropriate for hypothesis testing, according to the goodness of fit model's results, since each of the ten test requirements has been satisfied. The researcher presents the goodness of fit model test as follows:

Table 4. Goodness of Fit Model

Indicator	Score	Conclusion
APC	0.235, P<0.001	Fit
ARS	0.436, P<0.001	Fit
AARS	0.427, P<0.001	Fit
AVIF	1.666	Ideally
AFVIF	1.814	Ideally
GoF	0.544	Large
SPR	1	Ideally
RSCR	1	Ideally
SSR	1	Acceptable
NLBCDR	1	Acceptable

Source: processed using WarpPLS version 7, 2023

The next stage involves the R-square and Q-square tests. R-square assesses the likelihood of future research. In the R-square test, the R-square value is 0.445, while in the adj, the R-square is 0.438. Meanwhile, in the R-square test for SFP, the value is 0.426 with an adj—R-square of 0.416. The results in Table 4 indicate that the likelihood of future research is still significant.

Table 5 also presents the results of the Q-square test. The Q-square measures the accuracy of the research model. The Q-square value is 0.452, as seen in the RisM column. On the other hand, in the SFP column, the Q-square value is 0.432. These results indicate that the accuracy of the research model is relatively high. The results of the R-square and Q-square tests are as follows:

Table 5. R-square and Q-square

	RisM	SFP
R-square	0.445	0.426
Adj. r-square	0.438	0.416
Q-square	0.452	0.432

Source: processed using WarpPLS version 7, 2023

The concluding section presents the results of the path coefficient, serving as the basis for addressing the research hypotheses:

1. The direct test of sustainable strategies on sustainable financial performance. Table 6 shows that sustainable strategies using the proxies Eco, Soc, and Env have p-values <0.05.
2. The coefficient values for Eco are 0.344, Soc is 0.114, and Env is 0.107, indicating a positive direction.

3. The direct relationship between sustainable strategies and risk management. In Table 6, each proxy for sustainable strategies has p-values <0.05 (details: Eco <0.001, Soc 0.016, and Env <0.001).
4. The coefficient values are Eco 0.371, Soc 0.134, and Env 0.320.
5. The test of the direct influence of risk management on financial performance has similar results.
6. The significance result from RisM to SFP is <0.001 with a coefficient of 0.257.

The next part involves the indirect test uses three proxies for sustainable strategies. The indirect significance of the Eco proxy is 0.016, with a coefficient of 0.095. The Soc has an indirect significance value of <0.001 with a coefficient of 0.173. The Env also yields similar results, with an indirect significance value of 0.032 and a coefficient of 0.082. Thus, risk management successfully acts as a mediator in the relationship between sustainable strategies and financial performance. In conclusion, all hypotheses have been successfully addressed. Table 6 presents the path coefficient's findings:

Table 6. Path Coefficient and Hypotheses

Path	Coefficient	p-value	Decision
Eco→FP	0.344	<0.001	Accepted
Soc→FP	0.114	0.034	Accepted
Env→FP	0.107	0.044	Accepted
Eco→RisM	0.371	<0.001	Accepted
Soc→RisM	0.134	0.016	Accepted
Env→RisM	0.320	<0.001	Accepted
RisM→FP	0.257	<0.001	Accepted
Eco→RisM→FP	0.095	0.016	Accepted
Soc→RisM→FP	0.173	<0.001	Accepted
Env→RisM→FP	0.082	0.032	Accepted

Source: processed using WarpPLS version 7, 2023

Sustainable Strategies and Financial Performance of Tourism Operators

Our first finding is that sustainable strategies play a role in improving financial performance. The path coefficient results demonstrate that sustainable strategies (economic, social, and environmental) have p-values lower than 5%, indicating a significant influence. The economic, social, and environmental coefficients are positive. This result demonstrates that sustainable practices significantly improve the financial performance of tourism operators, addressing our first hypothesis.

Our findings align with research suggesting that economic (Domi et al., 2019; Pan et al., 2018; Sainaghi et al., 2017), social (Bagur-Femenías et al., 2015; de Grosbois, 2016; Ooi et al., 2015), and environmental (Claver-Cortés et al., 2007; Elkhwesky, 2022; Tan et al., 2017) components have a significant positive effect on financial performance. Additionally, we provide evidence supporting the view that tourism operators in Indonesia have implemented sustainable strategies effectively, thereby enhancing financial performance (Achmad & Yulianah, 2022; Fatina et al., 2023; Firman et al., 2023; Hermawan et al., 2023; Nugroho et al., 2023; Utami et al., 2023).

We present evidence regarding the depiction of sustainable strategies in tourism operators in Indonesia. Survey results also support research findings, indicating that, on average, respondents feel a positive impact from the implementation of sustainable strategies. Stakeholders directly experience tangible benefits, such as improved financial

Sustainable Strategy, Risk management, and Financial Performance of Tourism Operators
Tarjo et al. (2024)

Jki

performance. Thus, from the stakeholder theory perspective, sustainable strategies can provide satisfaction to stakeholders by practicing good social, environmental, and economic practices.

Sustainable Strategies and Risk Management

Our second finding is that sustainable strategies positively impact risk management. We validate this conclusion based on the path coefficient test outcomes. In the path coefficient table, each proxy for sustainable strategies, such as economic, social, and environmental factors, significantly and positively affects risk management. These results address our second hypothesis with significance values below 5% and positive coefficient values.

This finding supports the argument presented by Kim et al. (2021) that sustainable strategies can be one way to enhance risk management. Additionally, this research confirms the statement by Sainaghi et al. (2017) that the economic component is significant in risk management. Furthermore, Torres-Delgado et al. (2023) explain that implementing sustainable strategies also helps tourism operators mitigate the risk of fraud. Thus, our research aligns with previous theories and findings.

From the stakeholder theory perspective, risk management is one of the crucial components in addressing fraud. Fraud is scary for stakeholders, so tourism operators can implement sustainable strategies to address risk management issues (Tarjo et al., 2023). Sustainable strategies address social and environmental issues and play a crucial role in addressing the risk of fraud, ensuring continued financial improvement, and ultimately providing a happy ending for stakeholders. Thus, economic, social, and environmental strategies can help tourism operators enhance their risk management.

Risk Management and Financial Performance of Tourism Operators

Thirdly, risk management plays a crucial role in improving the financial performance of tourism operators. Table 6shows evidence that there is a significant and positive relationship between risk management and financial performance. The direct relationship between them has low significance values below alpha, and the high coefficient values provide evidence of a positive relationship. Thus, we successfully address our third hypothesis in this study.

This finding is consistent with the arguments put forward by Mandal and Dubey (2020), stating that risk management can enhance the financial performance of tourism operators. Several studies believe risk management can also encourage financial performance (Atz et al., 2021; Vishwanathan et al., 2020). On the other hand, the main reason destinations need risk management is the high incidence of fraud (Tarjo et al., 2023). Theoretically, an organization's risk assessment, in this case about tour operators, involves risk management. The role of risk management in mitigating risks, including fraud, is a primary function in reducing fraud. Bhatti and Nawaz (2020) explain that reducing fraud leads to an improvement in financial performance. Therefore, risk management is crucial in addressing fraud and improving financial performance.

From the stakeholder theory perspective, stakeholders will significantly enhance their well-being, including implementing risk management. It helps stakeholders address risks in the organization, assuring well-being for them. In this case, well-being translates

into financial performance. Therefore, our finding satisfies stakeholders because tourism operators can improve their financial performance by implementing risk management.

Sustainable Strategies, Risk Management, and Financial Performance of Tourism Operators

We find evidence that risk management can mediate between sustainable strategies and the financial performance of tourism operators. We prove that each component of sustainable strategies indirectly improves financial performance. For the economic component, the p-value of the indirect effect is significantly less than 5%, and the coefficient is positive. Similarly, for the social component, the significance value of the indirect model is less than 0.05, with a positive coefficient. Lastly, the environmental component also has a low significance value below 0.05, and the significant coefficient indicates a positive influence from the model. Based on these findings, we successfully address our fourth hypothesis and the main finding of this study.

We can prove the framework proposed by Whelan et al. (2021), stating that the relationship between sustainable strategies and financial performance has a mediator, namely risk management. Additionally, we confirm the theory of Roe et al. (2014) that risk management can bridge the theoretical gap between sustainable strategies and financial performance. These findings also align with research that develops the concept that risk management can be a mediator to increase financial performance (Atz et al., 2021; Vishwanathan et al., 2020). This finding also supports the theory that sustainable strategies (economic, social, and environmental) can enhance risk management (Kim et al., 2021; Sainaghi et al., 2017; Torres-Delgado et al., 2023), and risk management can improve the financial performance of tourism operators (Bhatti & Nawaz, 2020; Mandal & Dubey, 2020).

We integrate these results with stakeholder theory, suggesting that implementing sustainable strategies, such as increased profit, social well-being, and environmental preservation, is critical to improving stakeholder well-being (Whelan et al., 2021). Profit measures satisfaction for company owners (Domi et al., 2019; Pan et al., 2018; Sainaghi et al., 2017), social practices satisfy employees (Bagur-Femenías et al., 2015; de Grosbois, 2016; Ooi et al., 2015), and the surrounding community and environmental practices help preserve the environment around tourism operators (Claver-Cortés et al., 2007; Elkhwesky, 2022; Tan et al., 2017). On the other hand, the economic component also plays a crucial role in improving risk management. However, the other two components can also enhance risk management. Therefore, all three components complement each other, resulting in an improvement in risk management. Increased risk management will reduce or even avoid the risk of fraud or other detrimental risks to tourism operators (Ouyang et al., 2020). The advantages of risk management are that it can raise stakeholders' well-being and boost the financial performance of tourism operators.

CONCLUSION

Through risk management, this empirical study investigates the indirect impact of sustainable strategy on the financial performance of tourism operators. Tourism operators in Indonesia serve as the research object, with 250 respondents as the data source. Based on SEM-PLS results, this study validates four theories.

Sustainable Strategy, Risk management, and Financial Performance of Tourism Operators
Tarjo et al. (2024)

Jki

Firstly, sustainable strategies positively influence the financial performance of tourism operators. Sustainable strategies consist of economic, social, and environmental efforts. Economics involves efforts by tourism operators to increase profits. Social activities refer to the efforts of tourism operators to enhance the well-being of employees and the surrounding community. Environment refers to efforts to preserve the environment around tourism operators. All three sustainable strategies can improve the financial performance of tourism operators, satisfying stakeholders, including owners, employees, the community, and the surrounding environment.

Secondly, sustainable strategies positively influence risk management. The three components of sustainable strategy complement each other in enhancing risk management for tourism operators. The economic component is the spearhead of sustainable strategies in improving risk management. The rationale is that financial practices are related to accounting, creating a connection with efforts to prevent fraud. On the other hand, social and environmental components can also be methods of assessing potential risks, including fraud. Therefore, utilizing all three components can provide additional benefits to risk management.

Thirdly, risk management positively influences the financial performance of tourism operators. Theoretically, risk management is an assessment. This assessment plays a crucial role in addressing all risks and fraud. The evaluation can provide the necessary information to operators about existing risks, allowing managers to take appropriate action to address these risks effectively. Therefore, risk management is vital in mitigating risks and improving financial performance.

Fourthly, and most importantly, risk management successfully acts as a mediator between sustainable strategies and the financial performance of tourism operators. This finding provides empirical evidence for previous researchers who developed a framework regarding sustainable strategy, risk management, and financial performance. This result proves that sustainable strategies, in the form of economic, social, and environmental practices, can positively impact risk management. The subsequent improvement in risk management due to implementing sustainable strategies can enhance the financial performance of tourism operators.

Based on the test results, this research provides several suggestions as follows:

1. Practical implementation means managers must continue improving the three sustainable strategies: environmental, economic, and social. The economic and social strategy must be upgraded to a better level to increase sustainability performance rapidly.

2. Policy recommendations are that managers with government support must improve the implementation of risk management so that the risk of fraud can be reduced.

3. Performance assessment is on 4E, not only 3E (efficient, effective, economic). 4E is implemented throughout Indonesia to improve financial and sustainable performance.

Meanwhile, this research also presents limitations in the form of:

1. The main limitation of this study is that it needs to include respondents from tourism operators in the islands. The researcher only selected respondents from easily accessible tourism operators with readily available information. Another limitation is the absence of variables directly related to fraud, such as tourism scams, corruption, and asset misuse.

2. Recommendations for future research include various types of tourism in Indonesia, including technology-based tourism, to increase the research sample. Additionally, future researchers can add variables directly related to fraud or criminal activities in tourism operators.

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Tarjo et al. (2024)

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SMART BRANDING AWARD: ASSESSING DIGITAL BRAND AWARENESS AND IMAGE OF THE RECIPIENTS

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Article Info	Abstract
	City branding refers to a government initiative to highlight a local region's distinctiveness and competitive strengths to increase citizen satisfaction and pride, attract tourists and investments, and stimulate the local economy. In contemporary times, the practice of city branding can be enhanced through the utilization of information and communication technology to introduce the potential of a region, referred to as smart branding. This research aims to expand our understanding of smart branding in Indonesia by examining the Smart City Award given by the Ministry of Communication and Information, which only granted the Smart Branding Award to 15 out of 145 regions in 2021. The methodology employed in this study is a qualitative research design, utilizing a descriptive statistical approach and content analysis. The study found that some regions awarded the Smart Branding Award lack favorable brand awareness and image due to low rankings of government websites, insufficient website and social media management, and negative sentiments in online news and comments, highlighting the need for local governments to prioritize citizen engagement and information dissemination to strengthen their position and attract investment and tourism for sustainable economic and social benefits. Continuous improvement of digital branding is also crucial to adapt to digital trends.

INTRODUCTION

City branding is a government program aimed at promoting the uniqueness and competitive advantages of a local area compared to others (Ashworth, 2009) to build a positive perception and image of the city that can enhance citizen satisfaction and pride (Castillo-Villar, 2018), as well as attract visitors and investments (Dinnie, 2004; Ginesta & de San Eugenio, 2020) to boost the local economy. This approach has gained increasing attention from various local governments in Indonesia in recent years. Currently, there are at least three types of awards dedicated to local governments that have successfully promoted their cities through digital media. The first is the City Branding Award, organized by SuaraPemerintah.ID and TRAS N CO Indonesia, which evaluates the city's digital awareness, interest, and image (SuaraPemerintah TV, 2022). The second is the Indonesia Smart Nation Award (ISNA), held by Citiasia, which uses innovation profile, planning, implementation, and post-implementation parameters to assess the success of the branding efforts (Citiasia, 2022). Thirdly, the Smart City Award hosted by the Ministry of Communication and Information of the Republic of Indonesia (Kemkominfo), has smart branding as one of the award categories, which refers to the utilization of information and communication technology (ICT) to introduce the potential of a region (Rizkinaswara, 2022).

In today's digital era, city promotion activities can be more effective when utilizing social media (Acuti et al., 2018; Basit et al., 2020; Ramadhani & Indradjati, 2023), which can reach audiences wider and faster and allow for co-branding efforts between local governments and potential partners. However, the rapid development of digital technology poses both new challenges and opportunities for local governments to compete globally for visitors and investments. Therefore, in promoting their region, local governments should also consider international target/market/viewers, by providing content in English that represents internationalism, economic rationales, and quality assurance (see language commodification in Kholifah et al., 2021)

Despite the emphasis placed by both scholars and professionals on the crucial role of city brand management (Green et al., 2016), there has been little research conducted on smart branding, which refers to city branding that utilizes information technology and innovation to market the region and enhance competitiveness by developing the city's image, business, and tourism (Kemkominfo, 2021). This strategy promotes the region's potential at the local, national, and international levels (Kemkominfo, 2021). A search for articles related to smart branding using keywords on Scopus, such as "smart brand*" or "smart city brand*" or "smart place brand*" or "smart destination brand*", only yielded 34 articles between 2006 and 2023, indicating that smart branding, as one of the components of smart cities, has received little attention from academics and practitioners. The research focuses on evaluating citizen perspectives (C. S. Chan, 2023; Wang, 2023), as part of smart city projects (Arku et al., 2022; Grebosz-Krawczyk, 2021; Noori et al., 2020; Sobey, 2023; Ulimaz et al., 2021), and in the realm of smart tourism (C. S. Chan et al., 2019; Gretzel & Collier de Mendonça, 2019; Trinchini et al., 2019). This narrow focus reveals a significant gap in both the theory and practice regarding the broader application of information technology and innovation in city branding strategies.

In 2021, at least 145 cities/regencies throughout Indonesia received the Smart City Award, but only 15 were granted the Smart Branding Award (Table 1). The award

recipients are cities/regencies participating in the Towards Smart City Movement Program, organized by the Ministry of Communication and Information Technology (Kemkominfo), which has been ongoing since 2017. The evaluation focuses on the implementation of the Smart City Master Plan, assessing the progress and achievements of the smart city development program in the region. The evaluation method involves completing a self-assessment form, which is then validated through interviews by practitioners and academics with expertise and experience in smart city development (Kemkominfo, 2023).

Table 1. Count of Regions Awarded for Smart City in 2021 by Category

No.	Category	Number of Recipients		Total
		Regency	City	
1.	Smart Economy	11	6	17
2.	Smart Environment	9	7	16
3.	Smart Society	8	9	17
4.	Smart Governance	10	6	16
5.	Smart Living	8	8	16
6.	**Smart Branding**	**9**	**6**	**15**
7.	Masterplan Smart City 2021	43	5	48
		98	**47**	**145**

Source: Rizkinaswara, 2022

This study will focus on two elements in the branding dimension: brand awareness and brand image. According to Huh (2006), brand awareness is significant in achieving tourist satisfaction. Increasing brand awareness is essential for the government to effectively communicate, engage citizens, and achieve its goals. By building a strong and reputable brand, the government can enhance trust, transparency, and accountability, leading to better outcomes for society as a whole. The methods that can be undertaken by the government to increase its brand awareness include socializing city applications through strategic dissemination to schools, citizens, and government offices, along with utilizing word of mouth and social media (Martina et al., 2019; Wijaya et al., 2020), developing informative and creative branding strategies (Saleh et al., 2022), improving infrastructure, promoting regional identity, utilizing television ads, establishing sales centers, and organizing tourism events (Martina et al., 2019), intensive media campaigns, sponsored familiarization tours, and involving stakeholders in brand formulation (Chigora & Zvavahera, 2015).

The primary objective of destination marketing activities is to enhance brand awareness and improve the overall image of the destination (Lai & Li, 2015; Lee et al., 2016). Brand awareness refers to how strongly a brand is embedded in the consumer's memory (Kapferer & Valette-Florence, 2016), and it is determined by the extent to which a brand is remembered by consumers, ranging from recognition – recall – top of mind – dominant (Aaker, 1998). It is noteworthy that increased levels of brand awareness do not ensure acquisition or experimentation (Konecnik & Go, 2007) since this may be due to product curiosity. Nonetheless, if tourists are unaware of a destination, they are unlikely to consider it an alternative to visit (Veríssimo et al., 2017). Meanwhile, the appeal of a city is strongly associated with its identity and image (Papanikolaou et al., 2022). As cities worldwide face growing competition and escalating globalization resulting in greater investment, immigration, and job opportunities outside the city, numerous cities consistently renovate and improve their assets to showcase an attractive image. Tracking

these two aspects is essential when discussing the success of branding activities and building branding equity. Therefore, this study aims to provide knowledge enrichment in the field of smart branding, which has not been extensively explored. By examining awards related to smart branding in Indonesia, namely the Smart City Award given by the Ministry of Communication and Information Technology, we can gain a deeper understanding of how effective strategies are being implemented and recognized. These awards highlight cities that have successfully integrated technology and smart solutions into their efforts, setting benchmarks for other destinations to follow.

METHODOLOGY

This research was conducted from March to April 2023 to assess the digital brand awareness and digital brand image of the Smart Branding Award recipients through several digital media: search engine pages and the most popular social media platforms (based on the number of followers/subscribers) used by each region using the parameters in Table 2. The object of analysis in this study is the 15 Smart Branding Award recipients, which consist of nine regencies (Banyuasin, Gunungkidul, Kutai Kartanegara, Morowali, Muara Enim, Musi Banyuasin, Padang Pariaman, Pemalang, and Sukoharjo) and six cities (Ambon, Kediri, Kupang, Pontianak, Samarinda, and Semarang).

Table 2. Measurement Parameters for Digital Brand Awareness and Digital Brand Image

No.	Channel	Parameter	
		Digital Brand Awareness	**Digital Brand Image**
1.	Search engine	Count of search results related to the region using the keywords "*nama daerah*" (region name) "*wisata daerah*" (regional tourism) "*investasi daerah*" (regional investment)	Count of positive and negative sentiments towards headline news on the first five pages of search engine results (or 50 news articles) using the keyword "*nama daerah*" (region name)
2.	Website	Number of visitors in one year	Additional features available: multilingualism, emergency contact, live chat, dan social media integration
3.	Social media	Count of social media platforms utilized and the number of followers/subscribers on each platform	Count of positive and negative sentiments towards comments in the top 50 comments on the most popular social media platforms used by each region

Source: Adapted from parameters used in City Branding Award by SuaraPemerintah.ID and TRAS N CO Indonesia, 2022

The indicators and keywords mentioned above align with the smart branding framework delineated in the smart city masterplan preparation guide published by Kemkominfo (2021). Within this framework, it is articulated that smart branding initiatives may be implemented across various dimensions, including tourism branding, business branding, and city appearance branding.

In carrying out this research, several stages were undertaken. Initially, the researcher assessed digital brand awareness in each region through three key digital platforms: examining the quantity of search results on search engines, tracking the annual website visitation rates for each region, and evaluating the usage of social media platforms alongside the corresponding follower counts. Specifically, the evaluation of social media presence focused on four commonly utilized platforms—Instagram, YouTube, Facebook,

and Twitter—to facilitate comparative analysis. Data were collected over a specific period to ensure consistency and accuracy in the results. Additionally, a cross-verification process was conducted to enhance the validity and reliability. The results gathered from these assessments were then organized into graphs and tables, allowing for easy identification of disparities.

The subsequent phase entailed the assessment of digital brand image using the same three components: search engine, website, and social media. Here, the researcher delved deeper into gauging the sentiment towards each region. For example, in the search engine analysis, the researcher scrutinized the top 50 news articles about each region, discerning whether they conveyed positive, negative, or neutral sentiments based on the language used. The evaluation of brand image through websites involved examining various features aimed at benefiting the broader community, such as multilingualism, emergency contact information, live chat support, and integration of the website with other social media platforms owned by the respective regions. This emphasis on website evaluation acknowledges their significant role in shaping organizational impressions and public perceptions (Huang & Ku, 2016). Additionally, the assessment of social media sentiment was narrowed down to the platform with the highest follower count, with comments categorized into positive, negative, or neutral sentiments based on their linguistic cues. In evaluating the sentiment within the top 50 news articles and 50 comments, the researcher collaborated with an academic expert to ensure rigor and precision in determining these sentiments.

Overall, the data were analyzed using qualitative method, presenting the findings through figures, tables, and descriptive statistics. The data obtained from the measurement results were analyzed using the content analysis method, which is also described as studying traces to make sense of messages' (often unstructured) content, be they texts, images, symbols, or audio data (Gheyle & Jacobs, 2017). This method can be useful not only in condensing the factual content of written material, but also in portraying the author's attitudes or perspectives (Oleinik, 2021). In content analysis, whether examining news headlines or delving into comments, each piece undergoes meticulous categorization and scoring based on its sentiment: positive (1), negative (-1), or neutral (0) sentiment. This process is overseen by a language professional, ensuring both accuracy and consistency. Although conducted manually with guidance from a linguistic expert, this methodology adheres closely to the established criteria outlined in the Indonesian Sentiment Lexicon, as demonstrated in the research conducted by Koto and Rahmaningtyas (2017). With 3,609 positive words and 6,609 negative words, the lexicon provides a comprehensive framework for evaluating sentiment.

Guided by this lexicon, keywords are meticulously assessed and assigned scores reflecting their sentiment classification. For instance, a keyword aligned with a positive term earns a score of (+1), while one corresponding to a negative term receives a score of (-1). Keywords not found in the lexicon are deemed neutral and assigned a score of zero. Consider the sentence "*Hebat! Bupati Padang Pariaman Suhatri Bur, 2 sekaligus terima penghargaan* (Great! Regent of Padang Pariaman Suhatri Bur receives two awards simultaneously)". Here, the keywords "great" and "awards" evoke positivity, earning a positive score. Conversely, in the sentence "*Tolong pak walikota/wakilnya dengarkan keluhan masyarakat. Jangan diam aja* (Please listen to the people's complaints, Mr. Mayor/Deputy. Do not just stay silent)", words like "complaints" and "silent" carry

negative connotations, resulting in a negative sentiment score. Further examples can be found in the Appendix.

Following the scoring of all keywords, these values are aggregated to derive an overall sentiment score for the text. This comprehensive methodology enables us to discern prevailing sentiments within news headlines or comments across different regions. A higher aggregate score signifies a predominantly positive portrayal of the region across digital platforms, while a lower score suggests a less favorable depiction. For instance, the maximum sentiment score attainable on search engines is 50, indicating positive coverage in the top 50 news articles related to the region. Similarly, on social media platforms, a maximum score of 50 implies that the top 50 comments concerning the region convey predominantly positive sentiments. Adhering to the guidelines and categorizations provided by the Indonesian Sentiment Lexicon enables the distillation of complex textual data into actionable insights, fostering a nuanced understanding of public sentiment. The entire process conducted in this study can be illustrated in Figure 1 below.
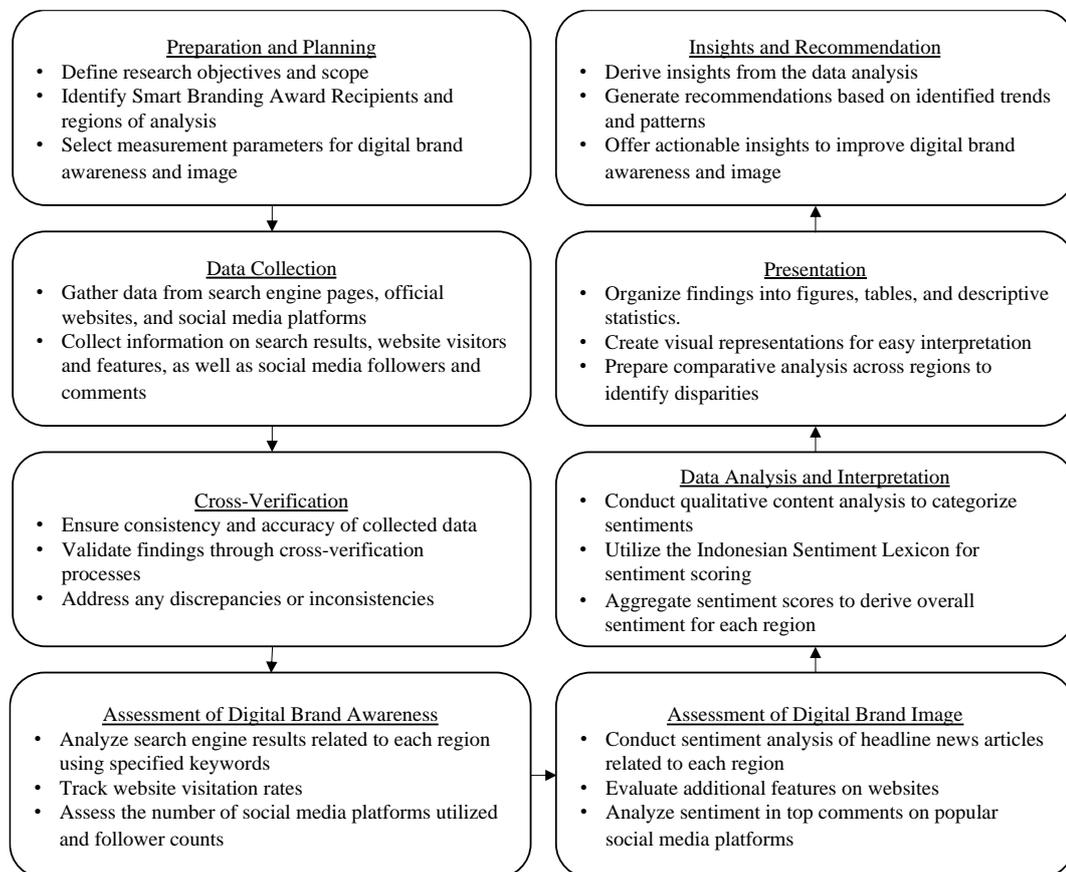
Figure 1. Research Framework
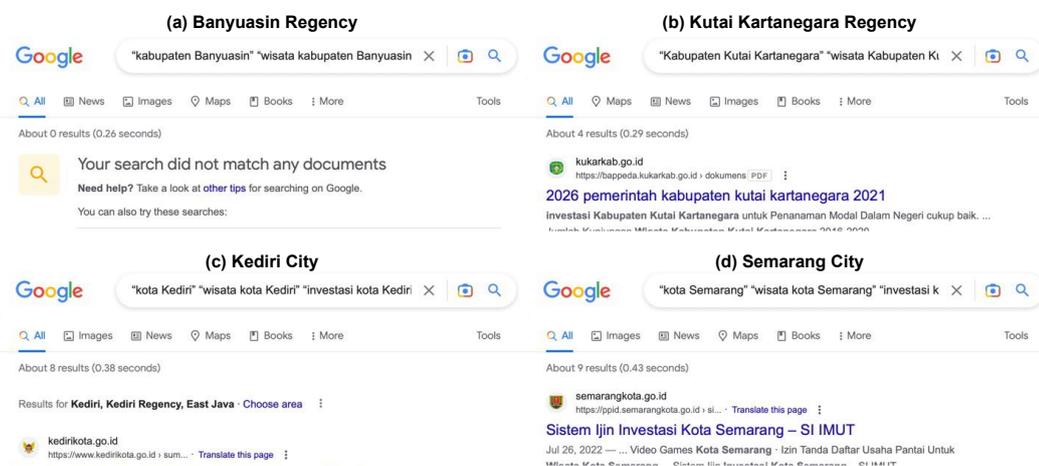Source: Author's analysis, 2023

## FINDINGS AND DISCUSSION

Digital Brand Awareness
Search Engine

Search engine optimization (SEO) is vital in evaluating digital brand awareness, as it allows organizations to enhance their website's ranking on search engine result pages

(SERPs). It leads to better brand recall and recognition, ultimately increasing brand awareness. As Dwivedi et al. (2021) discussed, social and digital marketing present considerable opportunities for organizations, including reduced expenses, enhanced brand recognition, and elevated sales. SEO is an essential component of digital marketing that can help organizations achieve their branding objectives. In the context of smart branding, the goal is to improve tourism, business, and city appearance, thereby enhancing local, national, and international competitiveness. To assess digital brand awareness, keyword combinations are used on search engines: "*nama daerah*" (region name) "*wisata daerah*" (regional tourism) "*investasi daerah*" (regional investment) (see Figure 2a). The results of the 15 regions analyzed are shown in Figure 2b, with most of them having search results ranging from zero to four, while only Kediri City and Semarang City had search results of eight and nine, respectively.
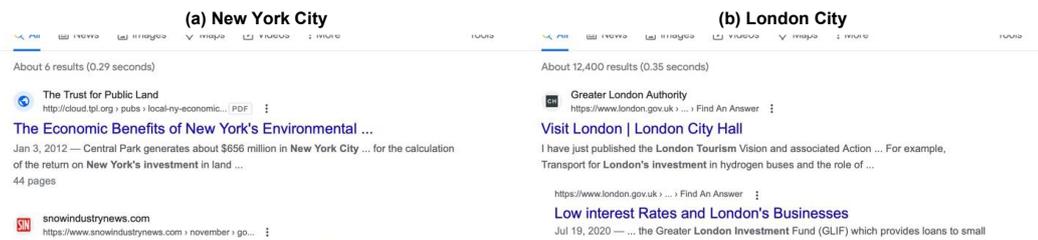

Figure 2a. Example of Search Results Using Three Keywords
Source: Author's analysis, 2023
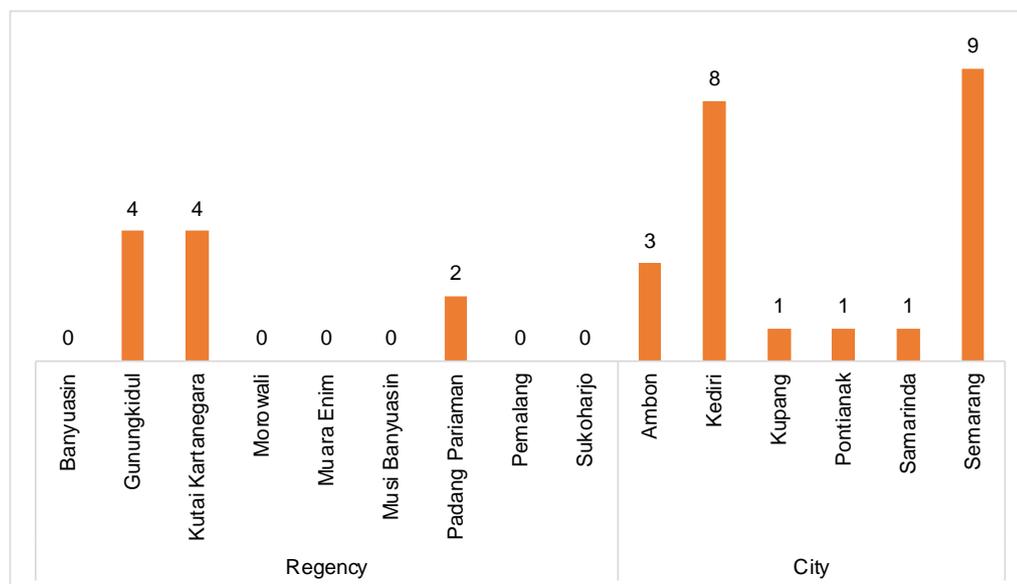
Figure 2b. Search Results on Search Engine (processed on March 30th, 2023)
Source: Author's analysis, 2023

As a comparison, Figure 3 displays the results of a search conducted using the combination of keywords ("city name" "city tourism" "city investment") for two cities in the world that ranked first (New York) and second (London) in brand value in the category of leading cities worldwide in 2021 (Statista Research Department, 2022). The search for the city of New York yielded only six results, while the search for London produced a staggering 12,400 results. This finding demonstrates that it is not simple to rank high in search engine results using a specific combination of three keywords. It highlights the challenges faced by website owners in optimizing their online presence and underscores the importance of implementing effective search engine optimization strategies.

Figure 3. Search Results Using Three Keywords for New York and London (processed on April 2nd, 2023)
Source: Author's analysis, 2023

Website and Social Media

In the realm of branding, websites and social media have become essential tools for promoting a brand. As Dinnie (2008) emphasized, an aesthetically pleasing and user-friendly website that provides comprehensive details about a particular city and its attractions is vital for effectively reaching prospective tourists, investors, and residents. Consequently, it is imperative for a great website to meticulously track and analyze visitor traffic to gain a deep understanding of user behavior and assess the effectiveness of branding strategies. By monitoring the number of unique visitors to a website, one can gain valuable insights into the scale of exposure to the content for first-time viewers. However, not all regional government websites provide visitor statistics on their pages, making measuring the website's audience reach challenging. Of the 15 regional websites analyzed, only four displayed visitor statistics on their pages, namely Musi Banyuasin Regency, Pontianak City, Samarinda City, and Semarang City. According to Benoist (2008), not all websites provide visitor statistics due to varying reasons such as privacy concerns, lack of awareness about data sensitivity, and potential misuse of collected data. Therefore, regional government websites need to recognize the importance of tracking visitor statistics to enhance their branding efforts and ensure they are effectively reaching their target audience. By doing so, they can optimize their impact and strengthen their presence in the digital realm, fostering greater engagement and connection with their community and beyond.

In addition to website traffic, social media followers/subscribers play a crucial role in contemporary branding practices. Social media platforms facilitate two-way communication, encouraging participatory branding and leading to an authentic brand that fosters a sense of ownership and affiliation among stakeholders (Uzunoglu, 2017). As depicted in Table 3, the smart branding award-winning regions effectively utilized social media by leveraging multiple platforms. Notably, nine regions, including Banyuasin Regency, Gunungkidul Regency, Kutai Kartanegara Regency, Morowali Regency, Musi

Banyuasin Regency, Pemalang Regency, Sukoharjo Regency, Kediri City, and Semarang City, exhibited proficiency in using social media platforms. Despite this, some regions encountered challenges in managing their social media accounts. For example, Muara Enim Regency had its Twitter account suspended, while Samarinda City experienced an Instagram hack (see Figure 4). Nevertheless, both social media accounts are still listed on each region's website.

Table 3. Number of Visitors/Followers/Subscribers on Website and Social Media

No.	Region	Website		Followers/Subscribers Number			
		Visitor	Rank	IG	YT	FB	TWT
Regency							
1.	Banyuasin	243.6K	309	**15K**	5.09K	12K	248
2.	Gunungkidul	349.4K	222	**31.1K**	1.67K	2.68K	3K
3.	Kutai Kartanegara	423.0K	171	**9.5K**	611	5.3K	202
4.	Morowali	84.5K	594	859	678	**3.14K**	79
5.	Muara Enim	103.3K	756	**4.14K**	604	3.2K	Suspended
6.	Musi Banyuasin	163.1K	415	**4.26K**	896	1.1K	130
7.	Padang Pariaman	219.7K	881	n/a	279	**5.8K**	2.3K
8.	Pemalang	226.2K	257	7.09K	3.29K	2K	**10.2K**
9.	Sukoharjo	300.6K	157	**25K**	3.34K	7.1K	4.99K
City							
10.	Ambon	163.3K	770	n/a	**9.09K**	6.3K	n/a
11.	Kediri	712.3K	104	**83.8K**	3.11K	37.25K	1.83K
12.	Kupang	38.2K	829	7.7K	713	**9.49K**	n/a
13.	Pontianak	49.4K	890	**31K**	n/a	6.2K	3.2K
14.	Samarinda	698.9K	97	Hacked	1.47K	**14K**	2.92K
15.	Semarang	3.9M	33	**149K**	25.2K	12K	15.6K

Note: Website visitor is a sum of all visits on desktop and mobile from the last three months as of April 14th, 2023. Meanwhile, the website rank is from Indonesia's government websites ranking list (https://www.similarweb.com). The number of followers/subscribers as of March 24th, 2023. Bolded figures indicate dominance
Source: Compiled from various sources, 2023
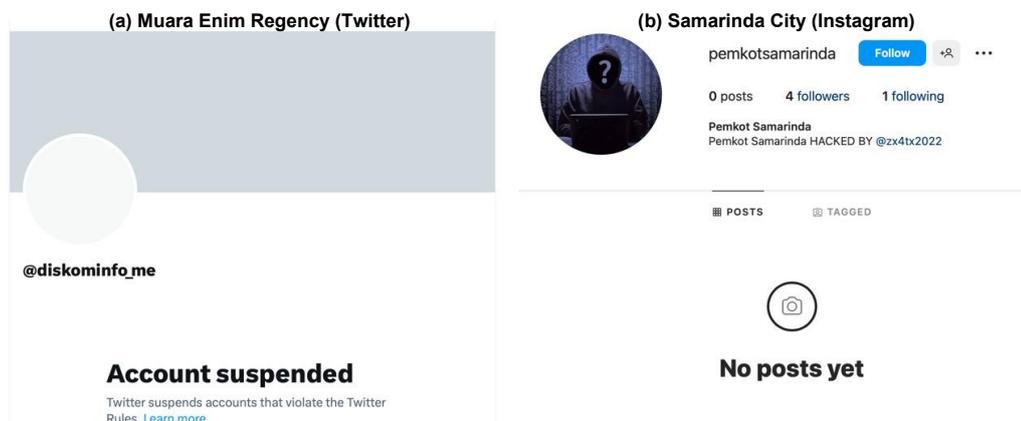
Figure 4. Suspended and Hacked Social Media Accounts
Source: Author's analysis, 2023

One interesting aspect is the varying social media platforms each region uses. Instagram is the most widely used platform, with nine regions predominantly utilizing it,

namely Banyuasin Regency, Gunungkidul Regency, Kutai Kartanegara Regency, Muara Enim Regency, Musi Banyuasin Regency, Sukoharjo Regency, Kediri City, Pontianak City, and Semarang City, which have the highest number of followers/subscribers compared to other social media platforms. Facebook is in second place, with four regions having the most followers on this platform: Morowali Regency, Padang Pariaman Regency, Kupang City, and Samarinda City. This finding aligns with the data reported by Kemp (2022) that Instagram and Facebook are the two most commonly used social media platforms in Indonesia, followed by WhatsApp. It is worth noting that a slightly different approach was taken on the website of Musi Banyuasin Regency, where the linked Facebook and Instagram accounts belong to the regent's social media instead of the region in general. Furthermore, the least popular platforms are YouTube and Twitter, each used by only one region, namely Pemalang Regency (Twitter) and Samarinda City (YouTube).

Meske and Stieglitz (2013) highlight the challenges social media managers face such as proving the value of social media and lacking decision-making power regarding staff and budget allocation. Therefore, it is imperative for regions and organizations to address these challenges strategically. Firstly, by adopting analytics tools to measure and demonstrate the return on investment (RoI) of their social media efforts. Secondly, granting social media managers decision-making power regarding staff and budget allocation is essential. Moreover, enhancing social media security measures and diversifying the social media presence can significantly contribute to effective management. By adopting a strategic approach that includes analytics, empowerment, security measures, and diversification, regions and organizations can effectively manage their social media accounts and leverage them to enhance their branding efforts.

Digital Brand Image
Search Engine

One element that shapes or influences a region's image and reputation is its coverage in mass media (Kearns et al., 2013). Therefore, the keyword "*nama daerah*" (region name) is used in the "news" section of a search engine to determine the extent of media coverage for the regions under study (see Table 4). The results indicate that five regions had over 10,000 news articles (Sukoharjo Regency, Ambon City, Kediri City, Samarinda City, and Semarang City). In comparison, six regions had fewer than 5,000 news articles: Kutai Kartanegara Regency (2,480 articles), Morowali Regency (1,650 articles), Muara Enim Regency (3,540 articles), Musi Banyuasin Regency (2,960 articles), Padang Pariaman Regency (3,300 articles), and Kupang City (4,900 articles). This discrepancy underscores the significant variation in media coverage among the regions, which in turn has a substantial impact on their visibility and reputation. Understanding the extent of media coverage is crucial for regional governments to develop effective branding strategies and enhance their image both nationally and internationally. It is advisable for regions with lower media coverage to invest in strategic communication approaches to increase their visibility and reputation, subsequently attracting more attention from potential tourists, investors, and residents.

Subsequently, the first fifty news headlines that appeared on each region's search page were examined using content analysis. The results are presented in Table 4, where the Banyuasin, Padang Pariaman, and Muara Enim regencies obtained the highest scores of 42, 39, and 39, respectively. These scores indicate that the top news in these three regions was

dominated by positive sentiment. Conversely, Musi Banyuasin Regency, Gunungkidul Regency, and Ambon City obtained the lowest scores with -3, -2, and 8, respectively, suggesting that the top news in these regions tended to be dominated by negative sentiment. This finding highlights the significant impact of media portrayal on a region's image and reputation. Positive news coverage can significantly enhance a region's appeal to tourists, investors, and potential residents, while negative coverage can potentially deter them. Therefore, regional governments need to actively manage and influence the narrative about their regions through strategic communication approaches. By doing so, they can shape a positive perception of their region, leading to increased attention and interest. This underscores the importance of comprehensive branding strategies that encompass both media management and online presence to establish a favorable image and reputation for the region.

Table 4. Results of Brand Image Search on Search Engine

No.	Region	Search Results (000)	Negative	Positive	Neutral	Score
Regency						
1.	Banyuasin	5.51	3	45	2	42
2.	Gunungkidul	7.10	20	18	12	-2
3.	Kutai Kartanegara	2.48	9	32	9	23
4.	Morowali	1.65	7	29	14	22
5.	Muara Enim	3.54	6	42	2	36
6.	Musi Banyuasin	2.96	23	20	7	-3
7.	Padang Pariaman	3.30	1	40	9	39
8.	Pemalang	7.27	3	30	17	27
9.	Sukoharjo	10.90	5	37	8	32
City						
10.	Ambon	12.30	16	24	10	8
11.	Kediri	16.90	7	31	12	24
12.	Kupang	4.93	6	30	14	24
13.	Pontianak	8.08	4	31	15	27
14.	Samarinda	26.40	1	36	13	35
15.	Semarang	44.10	6	19	25	13

Note: The keyword "nama daerah" (region name) was used on the news section of the search engine (processed on March 30th, 2023). See the Appendix for examples of online news headlines by category.
Source: Author's analysis, 2023

Website and Social Media

According to Dinnie (2008), a region's website has the potential to improve its image and reputation greatly. However, this depends on the effective design and maintenance of the website, which includes regular updates and user engagement as critical factors. Just like product packaging, the website and social media platforms used by a region can be considered the packaging of a city. Similar to a product's packaging, a city's online presence through its website and social media accounts can significantly shape the public's perception of the city. A well-designed website and active social media accounts have the ability to establish a favorable perception of the city, attracting potential visitors and investors, as Giannakopoulos et al. (2015) noted. Conversely, a poorly designed website and negative social media content can create a negative image of the city, deterring potential visitors and investors. Thus, cities must pay attention to their online presence and utilize sentiment analysis to monitor the public perception of the city.

Online social platforms, including forums, micro-blogs, and social networking sites, allow users to share their content, such as opinions and emotions related to a particular city (Fang & Zhan, 2015). Thus, sentiment analysis is useful for extracting valuable insights from a vast amount of textual data (Lamba & Madhusudhan, 2022). Analyzing the content of a city's website and social media presence makes it possible to gauge the public's perception of the city and pinpoint areas that require attention and improvement.

In this context, several indicators are used to assess how well a city manages its "city packaging" (website and social media). The first indicator is the multilingual menu. It is noted that only Semarang City provides a multilingual feature on its website. The availability of English as an international language is crucial if a city intends to target not only local and national audiences but also international audiences. Interestingly, Semarang City provides both English and a local language (Javanese) and Chinese (see Figure 5). It indicates that Semarang City recognizes the importance of preserving local languages. Indigenous languages are historically significant and essential to protect Indigenous peoples's cultural identity and dignity and preserving their traditional heritage (United Nations, 2016). Meanwhile, the City of Pontianak also provides a link for English, but the link does not function properly. Other regions should consider adopting this feature to cater to a broader audience, especially if they aim to attract investors, tourists, and international residents. Implementing these improvements will not only enhance the user experience but also contribute to the city's growth and global outreach.

Figure 5. Multilingualism on the Semarang City Website
Source: Author's analysis, 2023

Second, the availability of emergency contact information is vital to ensure that the public knows how to obtain the necessary services during crises. Concurrently, it is crucial to ensure that the residents respond suitably to any unforeseen emergencies that may arise (Kubás et al., 2022). Song et al. (2015) asserted that the effectiveness of an organization's information dissemination positively influences citizen participation. In emergency situations, prompt and relevant information dissemination enables citizens to remain

vigilant and respond accordingly by sharing situational updates. Consequently, local governments can promote citizen engagement and preparedness by utilizing online platforms such as social media and websites to disseminate emergency information and contacts. Effective government action is imperative during times of emergency, including emergency management and citizen engagement. The importance of stable and effective government in managing emergencies and how actions taken during an emergency or crisis can have long-term implications for citizens' health and safety. In this case, an evaluation of 15 city websites revealed that only two provided emergency contacts (Banyuasin Regency and Kutai Kartanegara Regency), including hospital, police, firefighter, and public order enforcers police (known as *satpol PP*) contact numbers (see Figure 6). Meanwhile, Kediri City only listed emergency contacts related to COVID-19.

Figure 6. Regencies Websites Providing Emergency Contacts
Source: Author's analysis, 2023

Emergency contact information is a crucial part of crisis management that can significantly impact the city's brand image. According to Junek et al. (2004), effective crisis management plays a crucial role in enhancing the destination's image post-disastrous events, aiding in restoring visitor confidence and positively influencing the city's brand image. Additionally, as stated in Avraham and Ketter (2012), crisis management strategies, including media campaigns, can effectively improve a city's negative image, attracting tourists, investors, and residents. Therefore, it is essential for cities to ensure the availability and functionality of emergency contact information to maintain their brand image and effectively promote public safety.

Third, the availability of direct interaction through live chat on the regional website. Virtual public forums, including live chat, have been recognized as an important and intentional avenue for public participation during emergencies (Park et al., 2022). Live chat facilitates the rapid and effective distribution of important messages that can be customized to suit diverse audiences. Moreover, it empowers communities to exchange and enhance pertinent information actively (Hyland-Wood et al., 2021). As such, incorporating live chat into city websites is imperative, as it promotes efficient communication between the government and citizens in times of emergency. In this regard, it is noteworthy that the Ambon City website is the only one that offers live chat services during business hours, from Monday to Friday, between 08:00 and 16:30 Eastern Indonesian Time. Although not available 24/7, this service provides a valuable platform for citizens to seek immediate assistance and information during critical situations, thereby enhancing public engagement and ensuring timely responses from the authorities.

Finally, integrating all social media platforms the local government uses into their website is crucial, as social media linking can enhance engagement, broaden reach, optimize search engine performance, and strengthen brand marketing efforts. In this study,

only four of the most commonly used social media platforms by local government websites are evaluated: Instagram, YouTube, Facebook, and Twitter. Generally, all local governments have integrated social media into their websites. Some have even integrated all four platforms simultaneously, such as Banyuasin Regency, Gunungkidul Regency, Morowali Regency, Pemalang Regency, Sukoharjo Regency, Samarinda City, and Semarang City. Furthermore, Semarang City provides various other social media platforms not found on other local government websites, such as Line, Pinterest, and WordPress. However, some local governments provide social media buttons that do not function properly, such as broken links (Instagram and Twitter of Ambon City) or failure to open the desired sites (Instagram, Facebook, and Twitter of Padang Pariaman regency). The selection of social media platforms used typically depends on the target audience and the nature of the content shared. A variety of platforms allows for more comprehensive engagement, as different demographics prefer different social media channels. It is recommended that all regions ensure their social media links are fully functional to maximize the potential of social media integration, ensuring effective communication and engagement with the public.

Overall, it's crucial that the regions address the issues highlighted and implement the missing features to provide a more comprehensive and user-friendly online experience. In summary, the four indicators discussed above are presented in Table 5 below.

Table 5. Website Features by Region

No.	Region	Multilingual	Emergency Contact	Live Chat	Social Media Integration			
					IG	YT	FB	TWT
Regency								
1.	Banyuasin	-	Available	-	Yes	Yes	Yes	Yes
2.	Gunungkidul	-	-	-	Yes	Yes	Yes	Yes
3	Kutai Kartanegara	-	Available	-	-	Yes	Yes	-
4.	Morowali	-	-	-	Yes	Yes	Yes	Yes
5.	Muara Enim	-	-	-	Yes	-	Yes	Yes
6.	Musi Banyuasin	-	-	-	-	Yes	-	-
7.	Padang Pariaman	-	-	-	Broken link	Yes	Broken link	Broken link
8.	Pemalang	-	-	-	Yes	Yes	Yes	Yes
9.	Sukoharjo	-	-	-	Yes	Yes	Yes	Yes
City								
10.	Ambon	-	-	Available	Broken link	-	Yes	Broken link
11.	Kediri	-	Only for Covid-19	-	Yes	Yes	Yes	Yes
12.	Kupang	-	-	-	-	Yes	-	-
13.	Pontianak	Broken link	-	-	Yes	-	Yes	Yes
14.	Samarinda	-	-	-	Yes	Yes	Yes	Yes
15.	Semarang	a. English b. Mandarin c. Javanese	-	-	Yes	Yes	Yes	Yes

Note: "Broken link" denotes a link that failed to direct to the desired page.
Source: compiled from various sources

Next, the top fifty comments that appeared on posts made by each region on social media with the highest number of followers/subscribers were examined using content analysis. The results can be seen in Table 6, where Ambon City, Kupang City, and Kutai Kartanegara Regency obtained the highest scores with values of 44, 30, and 25, respectively. This result indicates that the public's response to posts made by the government or directly to the government tends to be dominated by positive sentiment comments. Meanwhile, the regencies of Pemalang, Morowali, and Padang Pariaman obtained the lowest scores with values of -22, -5, and -5, respectively. It indicates that the top comments that appeared in these three regions tend to be dominated by negative sentiment comments. This finding suggests that there is a need for these regions to improve their online presence and communication strategies to foster more positive interactions with the public.

Table 6. Results of Brand Image on Social Media Comments

No.	Region	Social Media	Category			Score
			Negative	Positive	Neutral	
Regency						
1.	Banyuasin	Instagram	10	25	15	15
2.	Gunungkidul	Instagram	15	19	16	4
3.	Kutai Kartanegara	Instagram	11	36	3	25
4.	Morowali	Facebook	24	19	7	-5
5.	Muara Enim	Instagram	2	23	25	21
6.	Musi Banyuasin	Instagram	12	22	16	10
7.	Padang Pariaman	Facebook	22	17	11	-5
8.	Pemalang	Twitter	33	11	6	-22
9.	Sukoharjo	Instagram	18	16	16	-2
City						
10.	Ambon	YouTube	2	46	2	44
11.	Kediri	Instagram	11	22	17	11
12.	Kupang	Facebook	6	36	8	30
13.	Pontianak	Instagram	1	21	28	20
14.	Samarinda	Facebook	7	31	12	24
15.	Semarang	Instagram	3	11	36	8

Note: The analyzed social media platform is the most popular platform used in each region, as determined by the number of followers/subscribers compared to other social media platforms. See the Appendix for examples of public comments on government social media by category.
Source: Author's analysis, 2023

Brand awareness and brand image are crucial components of brand equity (Górska-Warsewicz, 2020). City brand equity refers to the perceived value of a city based on people's perceptions and experiences. Like commercial brands, cities can have strong or weak brand equity, influenced by their image and reputation among residents, tourists, investors, and others. Strong city brand equity attracts more tourists, generating revenue and boosting the local economy. A positive city image appeals to investors, leading to economic development and job creation, while also enhancing residents' pride and attachment, fostering community participation (Tang et al., 2023).

Regarding residents' pride and attachment, Social Identity Theory posits that individuals' self-concept is partially determined by the social groups they belong to, and they tend to view their own group more favorably (Masinga, 2022). According to this theory, positive comments about a region could enhance the citizens' sense of belonging,

contributing to a more positive public image. On the other hand, negative comments might undermine citizens' confidence and trust in their local government, potentially causing a negative impact on the city's image. By addressing the issues highlighted in this analysis, local governments can enhance their online engagement and strengthen their relationship with the community, ultimately contributing to the improvement of public perception and the promotion of a positive city image. Effective management of social media platforms can significantly impact public perception and satisfaction, thereby fostering a stronger sense of trust and connection between the government and the citizens. Cities with a positive image are also better equipped to handle crises, as they possess a strong support base and a solid reputation to uphold (An et al., 2023; Hoelscher et al., 2022; Katsinas, 2019).

Furthermore, according to Information Processing Theory, individuals process information differently based on the medium through which it is presented (Lang, 2000). Positive interactions online, especially via social media platforms, are instrumental in highlighting a city's tourism potential and influencing how people perceive it. Advances in information and communication technology have enhanced the role of social media in the tourism industry (Dwivedi et al., 2021), altering the relationship between tourist destinations and tourists' behavioral intentions (T. J. Chan & Imad, 2024). In the context of tourism promotion, social media provides a dynamic platform for showcasing a city's attractions, cultural richness, and unique experiences. By strategically leveraging social media channels, cities can effectively capture the attention of potential tourists and investors. Through engaging visual content, informative posts, and interactive features, cities can shape perceptions and evoke curiosity about their tourism offerings. When individuals encounter favorable narratives and authentic portrayals of a city's charm and hospitality on social media, they are more likely to consider it as a destination for their travels. Therefore, enhancing the management of social media platforms becomes crucial not only for maintaining a positive city image but also for fostering economic growth through tourism. By aligning with the principles of Information Processing Theory, such as tailoring content to suit the characteristics of each platform, cities can optimize their communication strategies to reach a wider audience.

CONCLUSION

The assessment of digital brand awareness and image among recipients of the Smart Branding Award offers crucial insights for local governments in Indonesia. Through analyzing various digital channels, including search engines, websites, and social media platforms, this study highlights disparities in online presence and reputation management among regions. The research findings reveal that not all regions receiving the Smart Branding Award have achieved good brand awareness and image. It is evident, among other things, from the low ranking of regional government websites in the government website category and the inadequate integration of website and social media management. Additionally, online news headlines and public comments are still dominated by negative sentiments.

In today's tourism management realm, effective digital branding strategies are essential for attracting tourism and investment opportunities. Regions with strong online visibility and positive sentiments tend to project a more appealing image, while those facing

challenges in managing their online reputation may struggle to attract stakeholders. Understanding theories like Social Identity Theory and Information Processing Theory becomes vital. They emphasize the importance of aligning narratives with tourists' perceptions and how they process information, all while making the most of digital platforms for dissemination.

To operationalize these insights, local governments should take several strategic steps. First, they should collaborate with digital marketing experts by forming partnerships with professionals who specialize in enhancing online visibility and managing online reputation. For example, partnering with local universities can leverage expertise in digital marketing campaigns aimed at promoting cultural tourism. Second, investing in digital literacy programs is crucial. By enhancing digital literacy among community members, governments can empower individuals to engage positively online and contribute to the region's digital brand. Implementing workshops and training sessions in collaboration with tech companies can boost digital skills among local entrepreneurs and residents. Third, developing adaptive regulatory environments is essential. Governments should create flexible policies that can adapt to the fast-evolving digital landscape. Establishing guidelines that encourage innovative digital marketing practices while ensuring the protection of local culture and heritage is a vital step. Additionally, addressing residents' needs and grievances proactively is important. Local governments should transparently communicate efforts and achievements through various digital channels. Utilizing social media platforms to regularly update citizens on development projects and solicit feedback can foster community engagement. Lastly, facilitating knowledge exchange platforms can be highly beneficial. Establishing a collaborative network for regional governments to share best practices in digital branding and online engagement could be achieved through a national forum organized annually, where representatives from different regions present their successful strategies and discuss common challenges.

Amidst intensifying global competition, local governments play a significant role in supporting national development by strengthening their position from within (by fostering a sense of pride among their residents) to outside (by creating attractions for tourists and investors). Initiatives should kick off with local governments attentively addressing residents' needs and grievances, and disseminating vital information through diverse channels. Citizens, in turn, should provide constructive feedback, actively contribute to the community, and monitor governmental performance. This positive collaboration not only enhances the region's image but also attracts foreign investment and tourists, thereby fostering sustainable economic and social benefits.

Moreover, continuous monitoring and enhancement of digital branding initiatives are imperative to adapt to evolving digital trends. Policymakers could facilitate the establishment of a collaborative platform or network for regional governments to exchange best practices and lessons learned in digital branding and online engagement. This platform would serve as a knowledge-sharing hub where regions exchange strategies, tools, and resources for enhancing digital presence and reputation. By fostering collaboration and knowledge exchange, policymakers can cultivate a supportive ecosystem for effective digital branding across regions, thereby driving collective improvement in online visibility and impact.

While this study sheds light on the digital brand awareness of Smart Branding Award recipients in Indonesia, its findings may not fully generalize beyond the specific

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regions examined. The focus on digital media data overlooks offline branding efforts' impact and could be complemented by offline data sources. Future research could explore a broader range of regions, incorporate offline data sources, and employ more sophisticated qualitative methods to deepen understanding. These steps would enhance the research's applicability and contribute to a more comprehensive understanding of smart branding strategies and their implications for tourism policy.

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INVESTIGATION OF TOURIST SATISFACTION WITH THE PUBLIC TRANSPORTATION IN BALI

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Article Info	Abstract
	Bali, a popular tourist destination in Indonesia, faces challenges from mass tourism, including ecological degradation and cultural changes. This study aims to examine Bali's transportation system using a mixed-method approach. Qualitative data from field observations and interviews were combined with quantitative data on transportation quality. Qualitative findings highlighted issues such as traffic congestion, while quantitative data revealed specific numbers on passenger satisfaction levels. Integrating both methods provided a comprehensive understanding of Bali's transportation landscape. The study emphasizes the role of technology in improving public transit services and enhancing tourist experiences. The implications include the importance of sustainable tourism planning and infrastructure development in addressing transportation issues in Bali.

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INTRODUCTION

Bali is a tropical island situated in Indonesia, positioned between the islands of Java and Lombok. Bali Island is renowned as a globally sought-after tourist destination, boasting exceptional attractions that set it apart in visitors' eyes. Bali possesses a rich heritage of customs and culture, further enhanced by its local inhabitants' warm hospitality. This genuine hospitality, ingrained in the Balinese people, creates a welcoming atmosphere that entices tourists to prolong their stay in Bali, it means that an authentic level of satisfaction is experienced by tourists when utilizing public transportation in Bali. Consequently, the tourism industry thrives, with a significant portion of the Balinese population employed in this sector (Megawati et al., 2023). Various aspects of Balinese culture serve as a rich source of inspiration for attracting local and international tourists. Many visitors are captivated by Bali's unique charm and choose to stay and draw inspiration from the island (Smith, 2015). Tourists play a crucial part in the tourism industry's economy. A tourist is an individual who journeys to certain destinations beyond their domicile or place of origin for leisure, holidays, commerce, cultural exploration, or other intentions. Travelers can explore a diverse range of destinations, encompassing natural wonders, historical sites, bustling metropolises, and other options. Bali and tourism are inseparable (Mooney, 2020). While Bali is commonly regarded as a haven for tourism, there are also dissenting opinions among travelers and locals regarding the adverse effects of mass tourism in Bali, including ecological degradation, cultural transformations, and unforeseeable occurrences (Suyadnya, 2021). The terrorist attacks known as the Bali Bombings I and II, along with the worldwide impact of the COVID-19 pandemic, have been the most devastating events for the tourism industry in Bali. This catastrophe had a debilitating effect on the Balinese economy, which heavily depended on the tourism industry for sustenance (Dioko, 2022).

Following the COVID-19 pandemic-related decline in the tourism industry, several nations, including Indonesia, have begun to revive their tourism industries (Akbar & Safira, 2023). At the beginning of 2020, Bali faced a decline in visitor arrivals due to the COVID-19 virus, causing all micro, small, and medium enterprises (MSMEs) to be unable to function normally. The economic downturn caused by the COVID-19 pandemic has resulted in a substantial decline in tourism businesses, forcing some to declare bankruptcy. Over two years, the pandemic, and evolving COVID-19 regulations, has restricted tourists from engaging in travel activities (Teeroovengadum et al., 2021). Subsequently, Bali had a slow resurgence after 2021, resulting in a revitalized tourism industry on the island. The Covid-19 pandemic has caused a delay in tourists visiting Bali. With the situation showing signs of improvement, there has been a notable rise in tourist arrivals to the island. This influx of tourists has positively influenced the economic activity in Bali, resulting in a boost to the local economy and benefiting the Balinese community (Suyadnya, 2021). Nevertheless, the economic growth of the Balinese population is hindered by some limitations within the community, particularly in public infrastructure (Putro et al., 2019). Road congestion is a significant problem. Amidst the economic recovery phase, numerous individuals expressed dissatisfaction over the traffic congestion on the streets of Bali. This situation emerged due to an increasing number of taxi drivers who identified a profitable opportunity amidst the rise in visitor numbers after two years of stagnation in Bali. Furthermore, the congestion experienced during the economic recovery phase in Bali was

Investigation of Tourist Satisfaction with the Public Transportation in Bali
Aryasih et al. (2024)

JKi

exacerbated by the influx of domestic tourists who opted for private modes of transportation, such as cars and motorcycles, for their vacations. In response to these issues, the Balinese and the central governments have taken further measures to enhance the public transportation system by implementing the Trans Metro Dewata bus program. This program has been in operation in Bali, particularly in Denpasar, Badung, Gianyar, and Tabanan, since 7th September 2020. The Teman Bus program, the third service after Palembang and Surakarta, is operated by the Ministry of Transportation of the Republic of Indonesia through the Directorate General of Land Transportation. This program aims to enhance public and tourist engagement in utilizing public transportation to alleviate traffic congestion and air pollution. In the world of tourism, many aspects support the success of tourism, including tourist destinations, infrastructure, accommodation, activities, promotion, environmental protection, policies, training, tourism services, and transportation (Nordhoff et al., 2020).

Sustainable public transportation systems make a positive contribution to the economic, socio-cultural, and environmental sustainability of the communities they serve (Besha et al., 2020). Transportation facilitates and enables all facets of human activity. Imagine a situation where someone needs to move an item from one place to another. Urban transportation plays a vital role in the advancement of cities. With the increasing need for public transportation services, it is crucial to guarantee that transportation infrastructure and amenities are sufficient and able to cater to this demand. The evolution of transportation modes has been a gradual process, culminating in its current state (Zhang et al., 2019).

The progress in transportation unfolds gradually, with incremental modifications leading to the establishment of the current modes of land, sea, and air transportation. The evolution of transportation initially relied on rudimentary technology derived from natural observations. The history of transportation spans the whole duration of human existence. In ancient times, specifically throughout the Paleolithic and early Neolithic eras, humans engaged in nomadic pursuits by utilizing their feet for mobility (Subyantoro et al., 2022). The advancement of transportation is closely intertwined with technological progress and closely aligned with societal demands. In recent years, technology has substantially changed the transportation sector, resulting in enhanced efficiency, accessibility, safety, and sustainability. Presently, the transportation business is experiencing tremendous growth, with an annual increase in the number of vehicles, including passenger cars, buses, freight cars, and motorbikes (Mayo et al., 2021). These technological innovations have revolutionized transportation inside urban areas and beyond, providing an enhanced experience for passengers and users. For instance, electric automobiles and driverless vehicles are linked to computer networks to streamline control.

Furthermore, technology is employed for traffic monitoring and management, including sensors and traffic information systems that offer drivers up-to-the-minute data. Moreover, the utilization of technology, such as mobile applications for reserving public transit and online ride-hailing services (like Gojek, Grab, and Uber), has significantly enhanced the convenience and accessibility of transportation for travelers on vacation during this surge in tourism (Ahidin et al., 2020; Hidayati et al., 2020). Furthermore, alongside the progress of road infrastructure, the Bali government and the central government are also enhancing bus-oriented public transit initiatives, such as Trans Metro Dewata and Trans Sarbagita. Trans Metro Dewata is a bus rapid transit (BRT) operating in

Bali. The government initiated the Trans Metro Dewata project to mitigate traffic congestion and enhance mobility on the island of Bali. Similar to Trans Metro Dewata, Trans Sarbagita is a public transportation service that operates on the island of Bali. Trans Sarbagita was initiated before Trans Metro Dewata with the primary objective of addressing the escalating traffic congestion and mobility challenges on the island of Bali. In addition to technology, transportation is intricately linked to tourism. Tourism is a multifaceted and continuously expanding industry that includes diverse activities, including recreational travel, trade, cultural exploration, and various other objectives (Richards & Londoño, 2022). Traveling is an inherent part of human life, driven by the want to explore new places, engage with local societies, and form connections. An area can be considered developed and advanced when both the government and the people actively promote its growth, as exemplified by the tourism sector in Bali. Public transportation can provide many benefits in various aspects, such as environmental, social, and economic aspects (Nusraningrum & Pratama, 2019).

The tourist industry in Bali is seeing notable growth due to substantial support from both the Balinese government and the national government. The government's involvement plays a crucial role in enhancing the overall economic well-being of the Balinese population. The conspicuous presence of several interconnected sectors within the tourism business is evident, with public transportation as a prime illustration. Tourism management is not easy to implement because many factors influence it. Public transportation is a form of mass transportation available to the general public and can be utilized by anyone. It is regarded as highly efficient as it helps alleviate congestion caused by private vehicle users. However, to promote unrestricted movement on the streets and prevent disruptions caused by traffic, it is imperative to cultivate a widespread understanding and appreciation of public transport among the general population. Public transit typically adheres to a predetermined timetable and follows a specific route. The route functions as a connection between the starting point and the destination in transportation. The progressive expansion of a region necessitates a corresponding augmentation in road infrastructure to enhance accessibility and optimize traffic flow. Public transport is crucial in tourism since it offers easy and cost-effective means for travelers to discover and traverse tourist locations. Public transportation in Bali has experienced significant growth, with the Bali government offering several forms of public transit (Justitia et al., 2019).

Additionally, private and internet transportation services are also available. Every form of public transportation possesses unique attributes and distinctions that vary based on multiple factors. One notable element of the disparities in public transport is its capacity. The capacity of buses might vary based on the specific requirements of their users. Buses are commonly utilized as a mode of transportation for a significant number of passengers or visitors. Like other individuals using public transportation, tourists wish to get high-quality service from public transit suppliers or organizers. High service quality can elicit satisfaction and admiration from tourists, hence encouraging their utilization of public transportation services (Sun et al., 2023).

Evaluating the quality of public transport services relies on tourist satisfaction as a crucial metric. The level of satisfaction among public transport users can be gauged by the number of individuals who use public transport. Efficient and effective public transit can enhance the well-being of urban inhabitants, alleviate traffic congestion, facilitate smooth mobility, and simplify access to tourist attractions for visitors. Tourist satisfaction with

Investigation of Tourist Satisfaction with the Public Transportation in Bali
Aryasih et al. (2024)

Jki

public transportation can be affected by multiple aspects, such as the presence and standard of public transportation infrastructure, the convenience of accessing public transit, and the level of comfort and quality of transportation service (Avermann & Schlüter, 2019). In Indonesia, there is still a prevailing parental preference for children not to travel alone. Parents are accustomed to personally escorting their children to and from school, as they believe it provides a safer and more comfortable environment when someone is present to supervise. The perception of an unsafe environment and uncomfortable transit are factors that parents take into account.

Nevertheless, comprehensive public transport amenities can ensure children's security, alleviating parental concerns. Facilities refer to various equipment, machinery, and services that serve as essential tools or aids for work. They encompass a wide range of commodities, equipment, and services that primarily serve to enhance work and are crucial components that must be utilized (Hidayati et al., 2020). In addition to amenities, the routes of public transport trips are also a crucial determinant of their sustainability.

For the sustainability of public transport, routes are essential when engaging in travel activities utilizing public transport (Miller et al., 2016). Routes play a vital role in the transportation infrastructure to support economic activities. They act as links between the origin and destination points in transportation. In general, the road network in Bali is adequately accessible and properly maintained. Nevertheless, some locations remain inaccessible due to insufficient road infrastructure for public transport. The substantial growth of tourism in Bali necessitates the establishment of a sufficient transportation infrastructure for tourists, encompassing well-maintained road networks that offer optimal conditions for comfortable travel (Susilo et al., 2017). Optimal road conditions will facilitate tourists' access to the intended attraction. Hence, the government and the tourism sector must collaborate in enhancing and expanding public transport infrastructure and networks to cater to tourists' demands and improve their contentment. This is because tourists seek broader routes to facilitate their vacation activities and other endeavors. Enhanced tourist pleasure fosters a heightened inclination to utilize public transportation anew, hence influencing the sustainability of such transportation systems (Roy, 2023).

Sustainable transport is intricately linked to both the economic and social aspects. Effective road infrastructure in a region or urban area contributes to enhancing the overall quality of life for its residents (Šenková et al., 2022). The quality of life encompasses the attainment of comfort, safety, and security in the residential setting, as well as the well-being of the community, economic vitality, and convenient availability of inexpensive transportation options for individuals. The government plays a crucial role in ensuring the long-term viability of public transport, aligning with the needs of the local community and tourists. By providing support, the government facilitates the accessibility and convenience of public transport. Sustainable travel offers numerous advantages, including the reduction of traffic congestion (Chua et al., 2020). Bali frequently has traffic congestion, particularly in densely populated tourist zones. Utilizing public transit can diminish the number of private automobiles on the road, mitigating congestion and reducing journey durations. Another advantage is the mitigation of air pollution. Private automobiles frequently provide a significant source of air pollution. Enhanced public transport systems can contribute to the mitigation of greenhouse gas emissions and air pollution, promoting improved air quality and public health. Contributing to sustainable tourism is an additional advantage for Bali's tourism industry. Bali is a prominent tourist hotspot, and the utilization of public

transport can effectively mitigate the adverse effects of tourism, such as traffic congestion and environmental pollution. This aligns with endeavors to uphold sustainable tourism in Bali. Furthermore, a significant advantage of efficient public transportation is its facilitation of navigation for unfamiliar tourists seeking to reach their desired destinations. For instance, they can utilize services such as Trans Metro Dewata and Trans Sarbagita or conveniently book motorcycle taxis online using their mobile devices (Aryasih et al., 2023).

The level of satisfaction among tourists regarding the facilities contributes to their safety, comfort, and overall experience as users of public transit in Bali. Before taking a tour, tourists carry out a travel decision-making process. This process is more influenced by experience and the quality of goods and services, as it is not possible to measure tourism products before enjoying them (Hapsari & Nuryakin, 2019). The sense of security experienced by tourists when utilizing public transit is a key factor since it directly pertains to the safety of tourists. Moreover, a heightened sense of comfort can enhance the whole experience of tourists utilizing public transit, leaving a lasting impression on them. The objective of this research paper is to improve the current public transport infrastructure and systems in Bali to uphold the positive reputation of Bali tourism among both local and international travelers. There was an increase in the number of vehicles like buses, trucks, motorcycles, and MPVs on the island of Bali between 2020-2022 (BPS Provinsi Bali, 2022), as shown in Table 1.

Table 1. The Number of Vehicles by Type in Bali Province (Unit), 2020-2022

Type of Vehicle	The Number of Vehicles in Bali		
	2020	2021	2022
Bus	9,205	8,911	11,257
Truck	156,624	159,003	171,603
Motorcycle	3,811,957	3,877,595	4,079,617
MPV	460,909	465,282	493,387
Total	4,438,695	4,510,791	4,756,364

Source: BPS Provinsi Bali, 2022

Based on Table 2, foreign tourists from this neighboring country increased significantly by 65.01% from the previous month. American tourists are still in fourth place, with 14,840 visits in November 2022. Table 2 shows that, based on this data, transportation facilities are needed so that tourists visiting Bali can be more satisfied (BPS Provinsi Bali, 2023).

Table 2. Visits of tourists from abroad

No	Country	Oct. 2022	Nov. 2022	Changeable (%)
1	Australia	86,029	73,113	-15.02 %
2	India	26,796	26,133	-2.47 %
3	Singapore	13,074	21,573	65.01 %
4	United States of America	14,648	14,840	1.01 %
5	Russia	9,436	14,364	52.23 %

Source: BPS Provinsi Bali, 2023

Investigation of Tourist Satisfaction with the Public Transportation in Bali
Aryasih et al. (2024)

Jki

The reason for improving transportation so far is that transportation in Bali has become booming, so that thought is needed so that traffic is not jammed, let alone the many attractions (Mouratidis, 2021), based on Table 2.

Table 3. Visit Level of Tourist Attractions in Bali

No	Tourist attraction	Traveler Foreign (Person)	Domestic Travelers (Person)
1	Balinese Museum	14,026	15,171
2	Museum Le Mayeur	2,470	3,233
3	The Bali Art Center	1,606	5,630
4	Attack Island	96,788	72,098
5	Blanjong inscription	153	172
6	Kumbasari Market	20,675	0
7	Badung Market	17,074	0
8	Fingerprint Painting Museum	69	292
9	Mon. The Struggle of the Balinese People	28,110	65,333
10	Mangroves	243	4,867
11	Dalem Sakenan Temple	570	1,541
12	Kertalangu Cultural Village	8,454	36,983

Source: Aryasih et al., 2023

Table 3 in the paper provides data on the visit levels of various tourist attractions in Bali. The table presents information on the number of foreign and domestic travelers who visit specific tourist attractions in Bali. Here is a detailed explanation example for 4 four visiting tourists based on Table 3 along with the associated figures: (1) Balinese Museum: Foreign Travelers: 14,026 persons; Domestic Travelers: 15,171 persons, (2) Museum Le Mayeur: Foreign Travelers: 2,470 persons; Domestic Travelers: 3,233 persons, (3) The Bali Art Center: Foreign Travelers: 1,606 persons; Domestic Travelers: 5,630 persons, (4) Attack Island: Foreign Travelers: 96,788 persons; Domestic Travelers: 72,098 persons.

These figures represent the number of foreign and domestic travelers who visit each of the mentioned tourist attractions in Bali. The data provides insights into the popularity and visitor traffic at these specific locations, highlighting the attractions that attract a significant number of tourists, both from within the country and internationally. The information presented in Table 3 allows for a comparative analysis of visitor numbers across different tourist attractions in Bali. By examining the data on foreign and domestic travelers separately for each attraction, researchers can identify trends in tourist preferences and the overall popularity of specific sites. This data can be valuable for tourism planning, marketing strategies, and improving visitor experiences at these attractions (Wang et al., 2023).

Based on Table 3, which provides data on the visit levels of various tourist attractions in Bali, is significant for tourism management and planning in the region. Here are some key implications of the data presented in Table 3: (1) Visitor Distribution: The table highlights the distribution of foreign and domestic travelers across different tourist attractions in Bali. This information can help tourism authorities and businesses understand the preferences of different visitor segments and tailor their marketing strategies accordingly. (2) Attraction Popularity: By showcasing the visitor numbers at specific tourist sites, Table 3 indicates the popularity of each attraction among tourists. This data can guide decision-making related to infrastructure development, crowd management, and

promotional activities at these sites. (3) Resource Allocation: The data on visitor levels can assist in resource allocation and investment decisions. Tourism stakeholders can use this information to prioritize funding for the maintenance, improvement, and promotion of attractions based on their visitor traffic. (4) Tourism Planning: The insights from Table 3 can inform tourism planning initiatives in Bali. By understanding which attractions attract the most visitors, authorities can develop sustainable tourism strategies that balance visitor numbers, environmental conservation, and local community engagement. (5) Enhancing Visitor Experiences: The data on visitor numbers can help enhance the overall visitor experience at tourist attractions. By analyzing the popularity of different sites, tourism operators can implement measures to improve facilities, services, and accessibility to meet visitor expectations. (6) Economic Impact: The visitor data presented in Table 3 also has economic implications. It can provide insights into the economic contribution of tourism to specific attractions and the overall tourism industry in Bali, guiding economic development strategies.

Overall, the data in Table 3 offers valuable insights into visitor trends, attraction popularity, and tourism dynamics in Bali, enabling stakeholders to make informed decisions to enhance the tourism experience and drive sustainable tourism growth in the region.

In the world of tourism, tourists play a crucial part in the functioning of the industry as they drive economic growth, contribute to cultural exchange, and fulfill various travel intentions such as leisure, relaxation, cultural exploration, or other motivations. Understanding tourist behaviors, preferences, and satisfaction levels is essential for destinations like Bali to enhance their tourism offerings and ensure a positive visitor experience. The integration of qualitative and quantitative data, as demonstrated in the study on transportation in Bali, provides a comprehensive understanding of the challenges and opportunities in the tourism sector. Moreover, sustainable transport infrastructure is vital for the economic and social well-being of a destination. Effective road networks not only enhance the quality of life for residents but also contribute to the overall satisfaction of tourists by providing convenient and safe transportation options. By analyzing visitor distribution and attraction popularity, tourism stakeholders can make informed decisions regarding resource allocation, infrastructure development, and crowd management to enhance the overall visitor experience and drive sustainable tourism growth in Bali.

Furthermore, the role of technology in improving public transportation services is highlighted as a key factor in enhancing tourist satisfaction. Technological advancements, such as real-time data provision, online ticketing services, and mobile applications, can significantly impact the quality and efficiency of public transit, ultimately leading to increased traveler contentment. The utilization of both online and offline transportation services in Bali caters to the diverse needs of travelers, offering convenience, flexibility, and choice in navigating the destination.

By synthesizing the findings from various sources, it becomes evident that a holistic approach to tourism development, encompassing infrastructure enhancement, technological innovation, and visitor satisfaction, is crucial for the sustainable growth of destinations like Bali. Understanding the interplay between tourist preferences, transportation services, and destination management is essential for creating a positive and memorable experience for visitors while ensuring the long-term viability of the tourism industry.

Investigation of Tourist Satisfaction with the Public Transportation in Bali
Aryasih et al. (2024)

Jki

The research presented in the article sheds light on several key aspects of transportation and tourism in Bali, highlighting the importance of sustainable transport infrastructure, technological advancements, and tourist satisfaction. However, some gaps in the existing literature could be further explored: 1). In-depth Analysis of Tourist Preferences: While the study touches upon tourist satisfaction with public transportation in Bali, a more detailed analysis of specific factors influencing satisfaction levels, such as safety, comfort, affordability, and accessibility, could provide valuable insights for policymakers and industry stakeholders; 2). Impact of Transportation on Destination Image: The article discusses the role of public transportation in enhancing tourist experiences, but further research could delve into how transportation infrastructure influences the overall destination image of Bali and its competitiveness in the global tourism market; 3). Integration of Sustainability Practices: While sustainable transport is mentioned as a key advantage, a deeper exploration of the integration of sustainability practices in Bali's transportation systems, such as the use of eco-friendly vehicles, renewable energy sources, and waste management strategies, could offer valuable recommendations for achieving a more sustainable tourism model; 4). Community Engagement and Stakeholder Collaboration: The study emphasizes the collaboration between the government and the tourism sector in enhancing public transport infrastructure, further research could investigate the role of community engagement and stakeholder collaboration in shaping transportation policies and initiatives in Bali; 5). Long-term Implications of Technology Adoption: The article highlights the importance of technology in improving public transit services, but a more comprehensive analysis of the long-term implications of technology adoption, such as digital divide issues, data privacy concerns, and the impact on local communities, could provide a more nuanced understanding of the benefits and challenges associated with technological advancements in transportation.

By addressing these research gaps, future studies can contribute to a more holistic understanding of the intersection between transportation, tourism, and sustainability in Bali, ultimately guiding evidence-based policy decisions and strategic planning for the sustainable development of the destination.

METHODOLOGY

The research methodology in the paper combines qualitative and quantitative data collection methods to provide a comprehensive analysis. Qualitative data, such as observations and descriptions of transportation, were gathered through field research in various locations in Bali. These observations focused on aspects like transportation modes, vehicle quality, and user satisfaction. Additionally, quantitative data on the quality of transportation services were collected to complement the qualitative findings. The data collection process followed established sampling techniques to ensure reliability and validity.

Furthermore, interviews with local communities were conducted to gather insights and perspectives on transportation in Bali. A SWOT questionnaire, based on the principles of Strengths, Weaknesses, Opportunities, and Threats, was utilized to analyze the data collected from the interviews. This approach helped in identifying key factors influencing

transportation services and tourism in Bali. The data collected from questionnaire distribution and interviews are presented in Figure 1 (Aryasih et al., 2023).
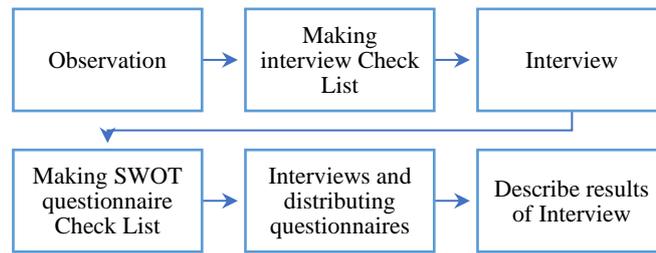
Figure 1. Methodology process
Source: Aryasih et al., 2023

Figure 1 illustrates the research methodology process followed in the study. The process involves a series of steps to gather data and insights related to transportation in Bali. Here is a detailed explanation of Figure 1: (1) Observation: The first step involves making observations related to transportation in Bali. Researchers conduct field observations at various locations to assess transportation modes, vehicle quality, and user satisfaction. These observations provide valuable insights into the current state of transportation infrastructure in Bali. (2) Making Interview Checklist: After the initial observations, researchers prepare a checklist for conducting interviews with local communities. This checklist helps ensure that all relevant questions and topics are covered during the interviews, allowing for a comprehensive understanding of the community's perspectives on transportation. (3) Interviews: Researchers conduct interviews with local communities to gather firsthand insights and opinions on transportation in Bali. These interviews provide qualitative data that can offer valuable perspectives on the challenges and opportunities in the transportation sector. (4) Making a SWOT Questionnaire: Following the interviews, researchers develop a SWOT questionnaire based on the Strengths, Weaknesses, Opportunities, and Threats framework. This questionnaire is designed to further analyze the data collected from the interviews and identify key factors influencing transportation services and tourism in Bali. (5) Interviews and Distributing Questionnaires: The next step involves distributing the SWOT questionnaires to a broader audience, potentially including stakeholders, experts, and other relevant parties. This data collection method helps gather diverse perspectives and insights on the transportation landscape in Bali, (6) Describe Results of the Interview: Once the data from the interviews and questionnaires are collected, researchers analyze and describe the results obtained. This step involves summarizing the key findings, trends, and insights derived from the data collection process. Overall, Figure 1 outlines a systematic approach to data collection and analysis in the study, combining qualitative observations, interviews, and SWOT questionnaires to gain a comprehensive understanding of transportation in Bali and its impact on tourism.

$$n = \frac{N}{1+N(e)^2} \qquad \qquad \textit{...(1)}$$

Investigation of Tourist Satisfaction with the Public Transportation in Bali
Aryasih et al. (2024)

Jki

Where:

n: number of samples

N: population size

e: error tolerance limit of about 5% - 10% (error tolerance).

Based on the Slovin formula above, the following is the presentation of the data to determine the number of samples to be taken based on the average data of tourist visits using transportation of 35,420 as follows:

$$n = \frac{35.420}{1+35.420(10\%)^2}; n = \frac{35.420}{453.21}; n = 99.99 \qquad ...(2)$$

The sample taken is 99.99 and rounded up to 100 responders based on the formula above. A Likert scale, which is used to gauge an individual's or a group's attitudes, opinions, and perceptions of social phenomena, is employed in this study (Marniati & Wibawa, 2018).

If a very good answer (SB) receives a score of 5, a good answer (B) receives a score of 4, an adequate answer (C) receives a score of 3, a poor answer (K) receives a score of 2, and a very poor answer (SK) receives a score of 1, the evaluation is used. To ascertain the valuation criterion or value vulnerability, the following procedure is used: (a) Establishes the achievable maximum and minimum scores. Since there is a maximum score of 5 and a minimum score of 1, the size of the score range will be determined by dividing the gap between the maximum and minimum scores. The value area (R) in this instance is 5 – 1 = 4; (c) Count the number of evaluation criteria that must be met and compare the values between the value areas to determine the size of the value interval. Here, the amount of ratings is determined by five criteria: very good, good, enough, less, and very less. (d) Establish the range of values for every evaluation criterion. 5:4 value interval = 0.8. The evaluated range in this instance is 1.81 – 2.60 with less category (K); 2.61 – 3.40 with sufficient category (C); and 1.00 – 1.80 with very less category (SK), 3.41–4.20 in the category of good (B); 4.21–5.00 in the category of very good (SB).

SWOT analysis is a methodical way to identify different aspects to create a business plan (Heshmati et al., 2022). The reasoning behind this analysis is to reduce Weaknesses and Threats while optimizing Strengths and Opportunities. Studies indicate that a mix of internal and external influences might impact a company's performance. In the SWOT analysis, both elements must be taken into account. In the business context, SWOT stands for Strengths and Weaknesses in the internal environment and Opportunities and Threats in the external environment, as seen in Figure 2 (Dong et al., 2022).

Table 4. Demography of respondents

No	Characteristics	Classifications	Total of Respondents (Person)	Percentage of Respondents (%)
1	**Gender**		**250**	**100%**
		Man	135	54%
		Women	115	46%
2	**Age**		**250**	**100%**
		15-29 Years Old	60	24%
		30-45 Years Old	190	76%

No	Characteristics	Classifications	Total of Respondents (Person)	Percentage of Respondents (%)
3	**Nationality**		**250**	**100%**
		Indonesian	244	97,6%
		Chinese	3	1.2%
		American	1	0.4%
		Malaysian	1	0.4%
		Australian	1	0.4%

Source: primary data processing, 2024

Quadrant 1: Things are quite profitable right now. To take advantage of current prospects, the government or linked parties might use their strengths and opportunities. In this situation, supporting strong growth programs is the necessary course of action. Quadrant 2: This administration has internal strength despite facing several threats. Utilizing strengths to seize long-term chances via a product/market diversification plan is necessary. Quadrant 3: The government has a lot of market potential, but several internal roadblocks or flaws exist. The main goal of this government strategy is to reduce internal issues to take advantage of greater market prospects. Quadrant 4: The organization faces numerous internal threats and vulnerabilities, making this an extremely undesirable situation. The inventor of this instrument, which is used in attachment 1, splits the responder groups according to nationality. The characteristics of respondents according to their nationality are displayed in Table 4.

The data gathering process in the study on tourist satisfaction with public transportation in Bali involved a mixed-method approach combining qualitative and quantitative data collection methods. Field observations were conducted to assess transportation modes, vehicle quality, and user satisfaction, providing valuable insights into the current state of transportation infrastructure in Bali. Subsequently, interviews were conducted with local communities to gather firsthand insights and opinions on transportation in Bali, offering qualitative data to understand the challenges and opportunities in the transportation sector.

To ensure comprehensive data collection, a SWOT questionnaire was developed based on the Strengths, Weaknesses, Opportunities, and Threats framework, further analyzing the data collected from the interviews and identifying key factors influencing transportation services and tourism in Bali. The SWOT questionnaire was distributed to a broader audience, potentially including stakeholders, experts, and other relevant parties, to gather diverse perspectives and insights on the transportation landscape in Bali. By addressing these points, the author can enhance the transparency and reproducibility of the research findings, ensuring a robust and well-documented study on tourist satisfaction with public transportation in Bali.

FINDINGS AND DISCUSSION

In this study, the research methodology incorporates qualitative and quantitative data to provide a comprehensive analysis. Qualitative data, such as observations and descriptions of transportation, were gathered through field research at various locations in Bali. These observations focused on aspects like transportation modes, vehicle quality, and user satisfaction. Additionally, quantitative data on the caliber of transportation services

Investigation of Tourist Satisfaction with the Public Transportation in Bali
Aryasih et al. (2024)

Jki

were collected to complement the qualitative findings. The data collection process followed established sampling techniques to ensure reliability and validity.

Furthermore, interviews with local communities were conducted to gather insights and perspectives on transportation in Bali. The data collected from the interviews was analyzed using a SWOT questionnaire based on strengths, weaknesses, opportunities, and threats. This approach helped in identifying key factors influencing transportation services and tourism in Bali.

Based on the paper, some data collection methods that can be presented in the findings and discussion sections include: (1) Number of samples: The paper mentions the use of the Slovin formula to determine the number of samples to be taken based on the average data of tourist visits using transportation in Bali, resulting in a sample size of 100 responders.

SWOT analysis data: The paper presents tabulations of SWOT analysis as internal analysis, including weights, ratings, and rating weights for strengths, weaknesses, opportunities, and threats related to transportation and tourism in Bali. (2) Positioning data: The paper discusses the SWOT position of Public Transport User Satisfaction in quadrant 1, indicating a very profitable situation based on specific axis points. (3) Data on facilities and infrastructure: Information is provided on the absence of facilities and supporting infrastructure to access public transportation, along with ratings and weightings for internal analysis. (4) Data on opportunities and threats: The paper outlines opportunities and threats related to tourism and transportation in Bali, including weights, ratings, and rating weights for various factors impacting the industry. These data points contribute to the analysis and discussion of the strengths, weaknesses, opportunities, and threats in the context of public transportation and tourism in Bali.

In discussion, the integration of qualitative and quantitative data through the mixed method provided a comprehensive understanding of the transportation landscape in Bali. By applying theoretical frameworks and referencing established research, the findings were justified and supported, enhancing the credibility and robustness of the study. It can be explained in more detail the findings that need to be thought about in the future, including:

Technology

Technological advancements are rapidly progressing in line with the times, mainly because humans now heavily rely on technology in their daily lives. In addition to facilitating travel activities, technology plays an increasingly vital role in enhancing service quality and boosting tourist satisfaction in public transit. For instance, furnishing details regarding the whereabouts and the arrival time of public transit may assist travellers in optimising their travel itineraries and minimising idle time. In general, technology can significantly enhance the calibre of public transportation and augment traveller contentment. Through the provision of real-time data, online ticketing services, and mobile applications, public transportation can enhance efficiency and dependability while promoting sustainability.

Online and Offline Transportation

The utilization of both online and offline transportation services is crucial in the context of Bali's tourism industry. Online transportation services, facilitated by technological advancements, offer convenience and efficiency for travelers by enabling

JKi

easy booking and access to various destinations. On the other hand, offline transportation services play a significant role in providing tourists with reliable and traditional transit modes.

The combination of online and offline transportation options caters to the diverse needs of travelers, offering flexibility and choice in how they navigate and explore Bali. Online services leverage real-time data and mobile applications to enhance efficiency and accessibility, while offline services provide tourists with a more personalized and hands-on experience. By incorporating both online and offline transportation modes, Bali can offer a comprehensive and integrated transport system that meets the varying preferences of visitors. This approach enhances the overall travel experience and contributes to the sustainable development of tourism in the region.

Online Transportation

Multiple digital transportation businesses, such as Gojek, Grab, and Maxim, currently provide services in Bali. Gojek is an Indonesian transport firm that operates through a digital application using technology. Founded in 2010 by Nadiem Makarim, Kevin Aluwi, and Michaelangelo Moran, Gojek is a digital application-based transportation business initially focused on Ojek services. Since its inception, Gojek has experienced significant growth and has emerged as a prominent technology and transportation company in Southeast Asia. Gojek has implemented innovations across all of its services in response to technological advancements (Lungsae & Maika, 2021). Gojek has developed a range of services, namely GoRide, GoCar, GoFood, Gopay, GoSend, GoLife, and GoMart. Gojek develops a range of internet-based services to enhance user access to their daily necessities and cater to travelers seeking to explore different areas solely through their mobile devices and internet connectivity, optimizing time efficiency. In addition to Gojek, Grab is another technology-driven public transport business that originated in Singapore and currently operates in other Southeast Asian countries. Founded in 2012 by Anthony Tan and Tan Hooi Ling, Grab first operated as an online taxi service. However, the firm has since broadened its range of services and now provides a diverse array of offerings, similar to Gojek. Grab has developed many services such as GrabCar, GrabBike, GrabFood, GrabExpress, GrabPay, and GrabMart. Maxim is an often-encountered online technology-driven public transit service in Bali. Similar to Gojek and Grab, Maxim is a transport service that relies on technology. Maxim is mainly recognized as a passenger transport service. Nevertheless, certain organizations have established delivery and courier services to cater to the diverse requirements of Maxim users. Maxim is frequently utilized by newly arriving tourists in Bali as a means of transportation to reach their hotel. Maxim is available in other European countries; but, unlike in Bali, it only has a few drivers. This is due to the dominance of Gojek and Grab, the primary online transportation services in Bali. The convenience and efficiency of online transportation are undeniable, as advancements in technology have enabled transportation services to be accessed through mobile devices. Despite technological advancement, numerous offline transportation options available in Bali.

Offline Transportation

Bali provides some offline public transportation that tourists and other users can access on the spot. The examples of offline public transportation in Bali are Trans Metro

Investigation of Tourist Satisfaction with the Public Transportation in Bali
Aryasih et al. (2024)

Jki

Dewata and Trans Sarbagita. According to Adiguna (35) as the operator of Trans Metro Dewata public transportation service, Trans Metro Dewata is intended for the general public or local people. However, domestic and foreign tourists also use it to travel in Bali. There are 5 Trans Metro Dewata bus corridors in Bali. Currently, Trans Metro Dewata bus users have increased and are used for tourists and users with other interests.

Route

Some regions in Bali are inaccessible by public transit due to the challenging road access in such areas. While public transport can reach many routes, road congestion significantly hinders their accessibility. Bali's road access is characterised by its relatively small size and high congestion, primarily resulting from the substantial volume of private transportation users. The high density of roadways in Bali leads to frequent delays in public transport, causing some users to opt for private transport. This, in turn, exacerbates congestion in Bali. Trans Metro Dewata is an instance of public transport that has encountered delays. Nevertheless, the abundance of Trans Metro Dewata transit units at its stops ensures that consumers may easily locate Trans Metro Dewata. Nevertheless, Trans Metro Dewata buses cannot reach certain regions in Bali, such as the island's northern section.

Online transportation has a more comprehensive route because the fleet comprises motorbikes and cars so it can reach all areas of Bali. Thanks to the existence of online transportation, residents who are in areas that cannot be accessed by public transportation, such as Trans Metro Dewata and Trans Sarbagita, can experience public transportation facilities when they want to travel to expedite goods from distant places.

Facilities

Facilities are crucial for ensuring the comfort of tourists when utilizing public transportation. Adequate facilities contribute to tourist satisfaction and play a significant part in supporting tourism activities. The public transportation facilities in Bali are highly comprehensive, with various safety amenities in the Trans Metro Dewata and Trans Sarbagita bus systems. The buses are meticulously maintained, ensuring cleanliness and providing a sense of comfort and security for many tourists who use this mode of transportation.

Sustainability

Sustainable transport is a crucial element in the growth of tourism. Consequently, it is imperative to consider technological advancements, available resources, and other relevant factors while coordinating between tourism and transportation. For instance, the accessibility of public transit to tourist attractions can contribute to the conservation of the environment and mitigate carbon emissions, traffic congestion, and traffic accidents (Naja et al., 2021). The road congestion in Bali is currently highly pronounced, with nearly every road experiencing congestion due to insufficient public understanding regarding the need to utilize public transport for air quality. Furthermore, public transport in Bali plays a crucial role in ensuring efficient traffic flow. Many tourists inquire about traffic congestion in Bali, as it significantly contributes to delays in public transportation operations.

Table 5. Tabulation of SWOT analysis as internal analysis

No	Strengths	Weight	Ratings	X Rating weight
1	The standard of packing and vehicle transportation services	0.3	4	0.12
2	Positioning and auxiliary facilities strategically at the public transit	0.15	4	0.6
3	The costs are reasonable and commensurate with the caliber of services rendered.	0.2	4	0.8
4	The cost that is being charged may be reasonable.	0.1	3	0.3
5	Forging strong relationships as education parties with the tourism industry, as well as with educational institutions	0.1	3	0.3
6	Family, friends, and relatives provided information about turtle educational tourism in an indirect manner	0.15	4	0.6
	TOTAL	**0.9**		**3.8**
	Weaknesses			
1	Travel agencies and government information regarding public transit, as well as the promptness of their responses.	0.03	2	0.06
2	Absence of facilities and supporting infrastructure to access public transportation	0.04	3	0.12
3	Employees' limited proficiency in languages other than English	0.02	2	0.04
4	Absence of promotion in several promotional channels, including television, periodicals, websites, and brochures	0.01	1	0.01
5	Limited linguistic diversity in advertising materials	0.01	1	0.01
	TOTAL	**0.1**		**0.24**

Source: primary data processing, 2024

Table 6. Tabulation of SWOT Analysis as external analysis

No	Opportunities	Weight	Ratings	X Rating weight
1	The way that tourism advances the global economy	0.3	4	0.12
2	Culture of Bali	0.2	4	0.8
3	Cooperation with public spaces and other attractions	0.15	4	0.6
4	Diversity of transportation as a public facility	0.2	3	0.6
	TOTAL	**0.75**		**3.2**
	Threats			
1	Lack of openness by local communities in maintenance and use of public transportation	0.07	2	0.14
2	Bali Safety and Stability	0.05	2	0.10
3	Bali's declining standards for comfort, hygiene, and environmental sustainability	0.04	1	0.04
4	Bali's vulnerability to climate change	0.08	1	0.08
	TOTAL	**0.25**		**0.36**

Source: primary data processing, 2024

Table 5 presents a tabulation of the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis as an internal analysis in the context of the transportation and tourism industry in Bali. The table outlines various internal factors that have been identified and evaluated based on their significance and impact on the sector. Here is a breakdown of the components: (1) Strengths: These are internal factors that are advantageous to the transportation and tourism industry in Bali. The table lists specific strengths such as the standard of packing and vehicle transportation services, strategic positioning of auxiliary facilities, reasonable costs relative to service quality, strong relationships with educational and tourism sectors, and indirect promotion through word-of-mouth, (2) Weight Ratings:

Investigation of Tourist Satisfaction with the Public Transportation in Bali
Aryasih et al. (2024)

Jki

Each strength is assigned a weight rating, indicating its level of importance or impact on the overall analysis, (3) X Rating Weight: This column represents the multiplication of the weight rating with the assigned score for each strength, reflecting the weighted score for each factor, (4) Total: The total weight and X rating for all strengths are calculated to provide an overall assessment of the internal strengths identified in the SWOT analysis, (5) Weaknesses: While not explicitly shown in the provided excerpt, it can be inferred that a similar breakdown of weaknesses would be presented in the table, highlighting internal factors that pose challenges or limitations to the transportation and tourism industry in Bali.

By tabulating the internal analysis in this manner, stakeholders can can clearly understand the industry's key strengths and weaknesses. This can inform strategic decision-making and planning to enhance the overall performance and sustainability of transportation services in Bali.

Table 6 presents a tabulation of the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis as an external analysis in the context of the transportation and tourism industry in Bali. The table outlines various external factors identified and evaluated based on their impact on the sector from an external perspective. Here is a breakdown of the components of Table 6: (1) Opportunities: These are external factors that present favorable circumstances or possibilities for the transportation and tourism industry in Bali. The table lists specific opportunities such as the global economic impact of tourism, the cultural richness of Bali, cooperation with public spaces and attractions, and the diversity of transportation facilities as public amenities, (2) Weight Ratings: Each opportunity is assigned a weight rating, indicating its level of importance or impact on the overall analysis, (3) X Rating Weight: This column represents the multiplication of the weight rating with the assigned score for each opportunity, reflecting the weighted score for each factor, (4) Total: The total weight and X rating for all opportunities are calculated to provide an overall assessment of the external opportunities identified in the SWOT analysis, (5) Threats: Similarly, the table would also include a breakdown of threats, which are external factors that pose risks or challenges to the transportation and tourism industry in Bali. These threats could include issues such as lack of community support, safety concerns, declining standards, and vulnerability to climate change.

By tabulating the external analysis, stakeholders can gain insights into the external factors that may impact the industry and identify strategic responses to capitalize on opportunities and mitigate threats. This structured analysis helps in strategic planning and decision-making to enhance the resilience and competitiveness of transportation services in Bali's tourism sector.

The X-axis coordinate points are derived by multiplying the total scores multiplied by the weights in the Weaknesses column by the total scores multiplied by the weights in the Strengths column, based on Table 5. The displays the Y-axis coordinates, which are determined by multiplying the total score in the Opportunities column by the weight and the total score in the Threats column by the weight, as indicated below in Table 6:

The coordinates of the X axis = 3.8 – 0.24 = 3.56
The coordinates of the Y axis = 3.2 – 0.36 = 2.84

SWOT Quadrant

Based on Figure 2, satisfaction with public transit is in quadrant I according to the X quadrant axis, which is placed at point 3.56, and the Y quadrant axis at 2.84. The position of public transportation satisfaction in the SWOT quadrant is as follows; Figure 2 illustrates this. Figure 2 shows that satisfaction with public transit is in quadrant 1, which is a highly advantageous situation. To capitalize on current chances, public transportation satisfaction has both internal potential and strengths. Under these circumstances, the growth-oriented approach that must be implemented is: Supporting Aggressive Policies.

Growth plans aim to increase sales, assets, profits, or both agreeably. Lowering costs, creating new goods, enhancing the caliber of goods or services, or opening up new markets are some ways to do this. One thing that can be done is to reduce expenses to boost revenue. If the level of satisfaction with public transportation is rising quickly and competitors are likely to engage in price wars to gain market share, then this approach is the most crucial.
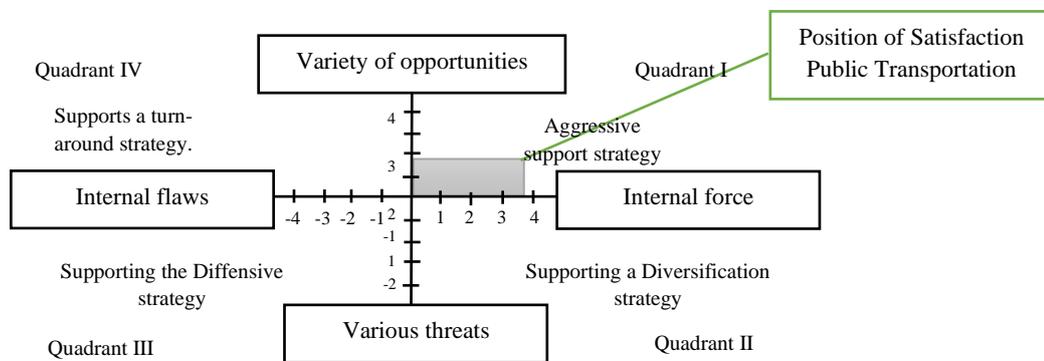
Figure 2. SWOT Quadrant
Source: primary data processing, 2024

The discussion of the results in the study on tourist satisfaction with public transportation in Bali demonstrates a balanced approach, ensuring that the findings are not overstated or overgeneralized. The data analysis is aligned with the existing literature and previous findings, providing a solid foundation for interpreting results. By integrating qualitative and quantitative data, the study offers a nuanced understanding of the challenges and opportunities in Bali's transportation sector, reflecting the complexities of the tourism industry in the region. The results are presented in a manner that is coherent with established research methodologies, ensuring the reliability and validity of the findings. Moreover, the discussion of the results is contextualized within the broader literature on transportation, tourism, and sustainability, drawing connections to previous studies and theoretical frameworks. By aligning the results with existing knowledge, the study contributes to the ongoing discourse on tourist satisfaction and public transportation in destination management.

By addressing the feedback on highlighting differences from previous research and providing possible reasons for such variations, the authors can enhance the significance and depth of their study on tourist satisfaction with public transportation in Bali. By comparing their findings to existing literature and identifying unique insights or divergent results, the authors can enrich the discussion and offer a more comprehensive analysis of the transportation landscape in Bali. Potential highlights to include in the manuscript could

Investigation of Tourist Satisfaction with the Public Transportation in Bali
Aryasih et al. (2024)

Jki

include: 1). Comparative Analysis: Identify specific areas where the study's findings diverge from or build upon previous research on tourist satisfaction with public transportation. This could involve differences in satisfaction levels, key factors influencing transportation preferences, or challenges faced by tourists in Bali; 2). Possible Explanations: Offer explanations or hypotheses for the differences observed in the study compared to prior research. This could involve factors such as changes in tourist demographics, evolving transportation infrastructure, varying stakeholder perspectives, or external influences impacting tourist experiences in Bali; 3). Implications and Recommendations: Discuss the implications of these differences for tourism management and policy-making in Bali. By understanding the unique aspects of tourist satisfaction with public transportation in the region, stakeholders can tailor strategies to address specific needs and enhance the overall visitor experience.

By incorporating these elements into the manuscript, the authors can elevate the research by providing a nuanced analysis of the findings in relation to existing literature, offering valuable insights into the dynamics of transportation and tourism in Bali.

CONCLUSION

This research project investigates the level of contentment among tourists regarding the public transport system in Bali. This research offers a novel perspective on the technology, online or offline, infrastructure, and pathways of public transport in Bali. According to this research, using of technology in public transportation is crucial for ensuring sustainable and efficient services that meet the demands of tourists and other users. According to recent reports, public transportation has made significant progress in the past decade regarding the technology being used in the industry. The implementation of contactless technology, mobile ticketing, and account-based fare collection has made transit more accessible and appealing for users, while also reducing its environmental impact. It is anticipated that new technologies such as edge computing, 5G, and the Internet of Things (IoT) will significantly change public transit, surpassing old systems in terms of cost-effectiveness, efficiency, and adaptability. Transit agencies are implementing new technologies to enhance system performance and better serve their patrons' requirements. The future of public transportation is bright, technological, and equitable, focusing on more significant equity in transportation to better serve previously underserved groups and communities. This is particularly evident in the case of tourists who rely on online transportation services in Bali. Online transportation services in Bali offer convenient and readily available options for travelers to engage in vacation activities. These services may be accessible at any time and provide transportation in the form of motorbikes.

Nevertheless, there are still instances where internet transportation drivers behave in a manner that causes visitors to feel uneasy and unsafe, such as engaging in harassment and displaying a lack of timeliness and discipline. As a result, certain tourists opt to utilize offline public transportation. Tourists in Bali have shown a highly positive reception towards offline transportation. Tourists express contentment with the amenities and provisions. In addition to positive feedback, certain tourists also offer their opinions and recommendations regarding the improvement of offline public transport in the future. These suggestions include expanding routes to ensure accessibility to all areas in Bali and proposing dedicated routes for Trans Metro Dewata buses. This is in response to the

congestion in Bali, which can cause delays in public transport services. The public transport network in Bali is incomplete due to the limited coverage of offline public transport. This is primarily caused by the lack of road infrastructure in the North Bali region, which restricts the operation of offline public transport services such as Trans Metro Dewata and Trans Sarbagita buses to urban areas only. Technological advancements have enabled online public transit to reach all places in Bali by utilizing motorcycles that can navigate the narrow roads in the North Bali region. Regarding the facilities, travelers express contentment with the comprehensiveness of the supporting amenities offered by public transportation in Bali, encompassing both online and offline modes of transit. The comprehensive amenities offered to visitors in Bali, such as helmets provided by online public transportation and fire extinguishers and automobile safety hammers provided by offline public transportation, ensure their safety and enhance their sense of security when utilizing public transportation services. This research aims to determine the correlation between visitor satisfaction and the sustainability of public transit in Bali. Through evaluating visitor satisfaction, stakeholders can analyze the quality and efficiency of public transport infrastructure and services in Bali. This assessment aims to enhance tourist satisfaction, promote the growth of the tourism industry, improve the well-being of the local population, and ensure the long-term sustainability of public transport.

The position of the SWOT Satisfaction public transportation quadrant is based on the x quadrant axis, located at point 3.56 and the y quadrant axis at 2.84. The SWOT position of Public Transport User Satisfaction is in quadrant 1, which means the situation is very profitable. Public transportation has internal opportunities and strengths so that it can take advantage of existing opportunities. The growth strategy for transportation development in Bali is designed to achieve the satisfaction of all parties, as explained in the previous paragraph. This can be achieved by improving the condition of provincial roads to village roads, regulating the use of motorbike classes on the road with the road class according to the motorbike class so that the quality of the road is made according to the class of motorbike users, it is necessary to increase the quantity of public motorbikes (public transportation) which are safe and aesthetic to reduce traffic jams.

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JKi

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SINGHASARI TOURISM SPECIAL ECONOMIC ZONE: CAN IT SURVIVE IN TODAY'S WORLD ECONOMY?

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Article Info	Abstract
	Indonesia is developing a Special Economic Zone (SEZ) in the tourism sector with Singhasari being the only SEZ that emphasizes cultural and historical heritage tourism. However, until the end of November 2022, Singhasari SEZ has not demonstrated significant success. This article explores the reason behind the Singhasari SEZ's relative lack of success compared to other SEZs, based on the results of research conducted in November 2022. It examines the institutional governance of the Singhasari SEZ since its inception and analyzes the obstacles encountered, utilizing the theory of the three main pillars of SEZ success. The research employed a qualitative approach utilizing a case study method. Data collection was conducted through observation, interviews, and literature study. The findings reveal that the Singhasari SEZ is managed according to existing regulations with Intelegensia Grahatama, Ltd. as a Development and Management Business Entity of the Singhasari SEZ. A significant obstacle identified from a strategic perspective was the initial decision to focus on a historic location for tourism, a choice that lost its relevance during the COVID-19 pandemic. However, the efforts to transition the Singhasari SEZ's focus from tourism to digital education demonstrate its strategic dynamism. In terms of strategic implementation, the Singhasari SEZ requires assistance from the Central Government regarding infrastructure development to achieve its objectives. The theoretical implication of this research is that it adds community actors to SEZ institutions. The allocation of special funds for infrastructure development in each approved SEZ as well as the increase of involvement of private and community actors in various SEZ activities are the policy implications of this research.

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INTRODUCTION

Tourism plays a crucial role in generating income and creating jobs for its workers, making it an important tool to accelerate development and improve the quality of life in developing countries (Abuhay et al., 2019; Yfantidou & Matarazzo, 2017). To maximize benefits, meticulous planning is essential in tourism development (Reindrawati, 2023; Stone & Stone, 2020). Indonesia has become a popular tourist destination, and the Indonesian government has developed Special Economic Zones (SEZ) in the tourism sector to attract investment and accelerate regional development (Fauzi et al., 2022; Habibi et al., 2021; Hidayat & Negara, 2020; Hornok & Raeskyesa, 2024; Hutauruk et al., 2023).

Indonesia began adopting SEZ policies, including for the tourism sector, in 2009 through Law Number 39 of 2009 Concerning Special Economic Zones (2009), implemented by Government Regulation Number 40 of 2021 (2021). A SEZ is a designated area with specific boundaries intended to perform economic functions and provided with certain facilities and incentives (UNCTAD, 2019). This policy aims to balance regional development while promoting rapid economic growth in areas that are strategically important to the country's overall economic progress (Considering Law Number 39 of 2009 Concerning Special Economic Zones, 2009). SEZs can accelerate regional development and serve as a model for boosting, economic growth, including industry, tourism, and trade, thereby creating jobs (Achmad, 2021). The establishment of SEZs is projected to generate high-value-added activities and a demand for skilled labor. With increased investment, demand for inputs, new infrastructure, and related activities is likely to rise, creating additional job possibilities (Taufiqurrahman & Khoirunurrofik, 2023).

A total of 20 SEZs are spread from west to east in Indonesia, comprising 9 SEZs focused on industrial activities, 4 SEZs focused on tourism activities, and 7 SEZs with multiple main activities encompassing tourism, industry, health, digital IT, and technology development (kek.go.id, 2024). As of 2023, the existence of all SEZs has attracted investments worth IDR 140 trillion and employed 86,273 workers from 318 business entities (Hidranto, 2023). This marks a significant increase compared to 2022 when 19 SEZs attracted investments worth IDR 113.21 trillion and employed 55,678 workers from 253 business entities (Dewan Nasional Kawasan Ekonomi Khusus, 2023).

There are several types of SEZs, categorized based on their specific objectives of the type and geographical considerations (UNCTAD, 2019). According to Government Regulation Number 40 of 2021 (2021), SEZ business activities in Indonesia include production and processing; logistics and distribution; research, digital economy, and technology development; tourism; energy development; education; health; sport; financial services; financial industry; creative industry; development and management of SEZ; provision of SEZ infrastructure; and other economies.

SEZ Singhasari is one of the 7 SEZs with more than one main activity. Singhasari was designated as a SEZ based on Government Regulation Number 68 of 2019 (2019), with its primary activities being tourism and digital development. Singhasari is unique among SEZs due to its tourism and cultural approach (Dewan Nasional Kawasan Ekonomi Khusus, 2022). Singhasari is the only SEZ that features a historical heritage tourism theme centered around the remains of the Singosari Kingdom. Therefore, it is expected that it will increase the search for and preserve historical sites, temples, and artifacts (Amiruddin et al., 2021). However, as of late November 2022, there has been no significant progress in

Singhasari Tourism Special Economic Zone: Can it Survive in Today's World Economy?
Anisah et al. (2024)

Jki

the tourism sector. Consequently, SEZ Singhasari then shifted its main activities to education and digital (Dewan Nasional Kawasan Ekonomi Khusus, 2023). In mid-2022, Singhasari SEZ faced the threat of operational cancellation and was classified as an SEZ category requiring special attention.

The designation of Singhasari as a tourism-focused SEZ was accompanied by the target of attracting investors through the provided facilities and incentives. However, considering its development, the Singhasari SEZ can be regarded as inefficient as it received SEZ status with special attention. This article aims to answer the question of why the Singhasari SEZ is less successful compared to other SEZs. Although several studies have explored the development and management of the Singhasari SEZ by proposing ideas for implementing good governance through the latest technological innovations (Cahyandari et al., 2022), tourism development based on community readiness (Amiruddin et al., 2021), strategic targets based on weakness and threats analysis (Sentanu et al., 2023), and strengthening collaboration between stakeholders (Arini & Dwiputri, 2021), these studies do not yet address the institutional aspects of the SEZ or analyze the obstacles faced from a theoretical perspective. Therefore, this article highlights the institutional governance of the Singhasari SEZ since its inception and analyzes the obstacles it has faced using the theory of the three main pillars of SEZ success: strategic approach, strategic dynamism, and strategic implementation (Aggarwal, 2019). The analysis includes a comparison of SEZ's success in other countries.

METHODOLOGY

This research employed a qualitative approach utilizing the case study method, aimed at obtaining a systematic, factual, and accurate understanding of the facts, characteristics, and relationships in the implementation of the Singhasari Tourism SEZ (Miller & Yang, 2008). The research was conducted within the Singhasari SEZ located in Malang, East Java. Singhasari SEZ was selected due to its need for progress in achieving the set targets, particularly in its tourism activities.

The initial data collection method involved gathering secondary data, from a range of official SEZ-related documents, SEZ regulations, studies published in scientific journals, and articles about SEZs in both print and online media. Subsequently, field visits were conducted to obtain primary data using in-depth interview techniques and field observations. In-depth interviews were conducted using a prepared interview guide involving various parties, including the Development and Management Business Entity (DMBE) Singhasari SEZ, the President Director of Singhasari SEZ and the Regional Government of Malang Regency (Department of Investment and One Stop Integrated Services, Regional Development Planning Agency). The research activities were conducted in November 2022.

After the data collection phase, analysis is conducted and conclusions are drawn. At this stage, conclusions are also verified as the analyst proceeds. Lengthy discussions and reviews are facilitated among colleagues through mechanisms like Focus Group Discussion (FGD) to develop "intersubjective consensus" or with extensive efforts to replicate findings in other data sets. The FGD involves researchers from the Institute of Home Affairs Governance, the Management of the Indonesian Tourism Association, and the SEZ Development and Management Business Entity. The emerging meaning from the

data is adjusted based on its plausibility, robustness, and confirmability, ensuring its validity.

The data analysis model utilized in this research is the interactive model by Miles et al. (2014). The components in data analysis as outlined by Miles et al. (2014) are as follows:

1. Data condensation involves selecting, simplifying, and focusing the collected data including both secondary and primary data resulting from observations and interviews. During this stage, data coding is carried out which will be facilitated using the NVIVO 12 tool.

2. Data display involves organizing and combining information related to research objectives, such as the background of the Singhasari SEZ, its objectives, changes, and obstacles. Presenting the data here helps to understand the context of the research because it presents a more in-depth analysis.

3. Drawing and Verifying Conclusions involves discussing the collected and analyzed data in FGDs to validate the data and provide clearer information regarding the Singhasari SEZ. These findings are compiled in the form of conclusions.

The stages of data analysis can be seen in Figure 1.
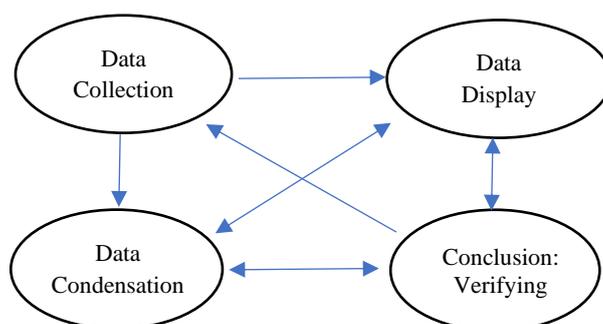
Figure 1. Model of Data Analysis Technique
Source: (Miles et al., 2014)

FINDINGS AND DISCUSSION

General description of the Singhasari SEZ

According to the Singhasari SEZ website, this place is strategically located due to its easy accessibility. The SEZ is approximately ±15 kilometers via Abdul Rahman Saleh Airport; only 15 minutes via the toll road from the Singhasari toll exit; ±13 kilometers from Lawang train station; and ±15 kilometers from Malang train station (singhasari.co.id, 2024). However, despite its proximity, accessibility to the Singhasari SEZ is unfortunately ineffective. To reach the SEZ, one must diverge from the main road, Jalan Raya Singhasari-Surabaya, as it is located on a different side of the main road. The journey also involves traveling about 2 kilometers through the residential areas.

The Singhasari SEZ is situated in the sociocultural area, enriched with relics of the Singosari Kingdom, such as temples, albeit not within the same area. Within this area, lies Singasari Museum, with plans for further development, including the construction of a hotel and the provision of tourist hospitality support. On the website, it is stated that the Singhasari SEZ is equipped with a clean water supply, a high-speed internet connection, and two stable power supply sources. Moreover, Singhasari SEZ prioritizes digital

Singhasari Tourism Special Economic Zone: Can it Survive in Today's World Economy?
Anisah et al. (2024)

Jki

economic platforms to foster synergies between the tourism business and the digital economy. The combined system will create a unique digital ecosystem in the Singhasari SEZ (singhasari.co.id, 2024).

Singhasari was designated as a SEZ based on Government Regulation Number 68 of 2019 (2019) to develop economic activities in Malang Regency. In its early stage, the Malang Regency Regional Development Planning Agency, in collaboration with the SEZ National Council Secretariat and the East Java Province SEZ Secretariat, formulated a development action plan. At the district level, Malang Regency Regional Development Planning Agency, along with related agencies, such as Jasa Marga, Regional Drinking Water Company, and Dinas Cipta Karya, formed an Operational Acceleration Team. This team was formed based on the Regent's Decree and led by the Head of the Malang Regency and Malang Regency Regional Development Planning Agency. Monitoring and evaluation of the Acceleration Team are conducted every 4 (four) or 6 (six) months by the Central and Provincial authorities.

In line with Government Regulation Number 68 of 2019, Singhasari SEZ was established in September 2019 with a focus on the tourism sector and digital development. The Development and Management Business Entity (DMBE) proposed the Singhasari area as a tourism SEZ after completing the study in 2015-2016. This area boasts the former Singosari Kingdom area in the form of a temple, as well as the presence of a tourist center in the Bromo - Tengger - Semeru National Park. However, shortly after operating, the onset of COVID-19 posed challenges in attracting investors to the tourism sector. Consequently, the DMBE directed Singhasari SEZ to digital development (personal communication, November 30, 2022).

At the beginning of the proposal, the Singhasari SEZ spanned approximately 300 hectares. Nevertheless, after Singhasari was officially granted SEZ status in November 2022, the area was reduced to approximately 120.3 hectares. The construction is divided into two stages: the first stage covers an area of 44.2 hectares for the technology area and some tourism areas, while the second stage is designated for special tourism areas.
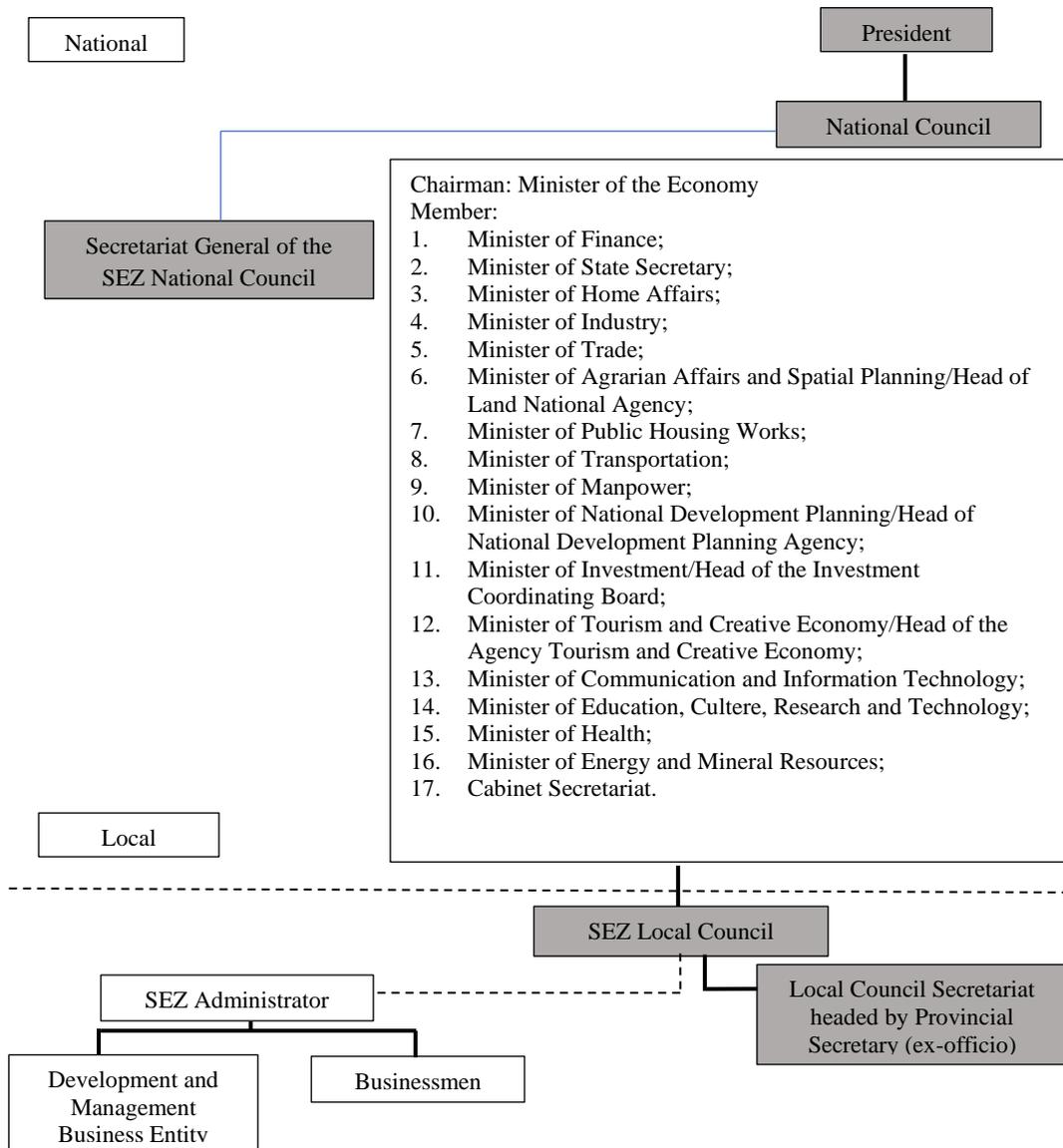
From a fiscal perspective, the facilities provided include investment allowances for up to 10 years and tax holidays of 20% - 100% for 5 - 25 years, granted to business entities or business actors. Exemption from import duties on machinery and equipment free of Value Added Tax and Sales Tax on Luxury Goods within and between zones and SEZs is also offered. Additionally, investors benefit from compensation for losses for up to 10 years, a reduction in net profit by 30% of the investment value, and accelerated depreciation of tangible fixed assets. These facilities were designated to provide a profitable solution for investors who invest in SEZ.

Management of the Singhasari SEZ: Institutional Aspects

Four key institutions have distinct duties and authorities in the SEZ, as mentioned in Article 50 of Government Regulation Number 40 of 2021 (2021). These institutions are the National Council, the Secretariat General of the National Council, the Regional Council, and the SEZ Administrator. The hierarchical position of each institution is illustrated in Figure 2. Following the formation of the SEZ, the responsibility of managing the SEZ was assigned to the DMBE which was formed as a step to accelerate the optimization of SEZ. Based on Government Regulation Number 40 of 2021, the DMBE was formed under the function of SEZ administrators. The establishment of the DMBE

represents a concrete step in synergizing the roles of the government and the private sector as investors in advancing SEZ development.

National

President

National Council

Secretariat General of the
SEZ National Council

Chairman: Minister of the Economy
Member:
1. Minister of Finance;
2. Minister of State Secretary;
3. Minister of Home Affairs;
4. Minister of Industry;
5. Minister of Trade;
6. Minister of Agrarian Affairs and Spatial Planning/Head of Land National Agency;
7. Minister of Public Housing Works;
8. Minister of Transportation;
9. Minister of Manpower;
10. Minister of National Development Planning/Head of National Development Planning Agency;
11. Minister of Investment/Head of the Investment Coordinating Board;
12. Minister of Tourism and Creative Economy/Head of the Agency Tourism and Creative Economy;
13. Minister of Communication and Information Technology;
14. Minister of Education, Cultere, Research and Technology;
15. Minister of Health;
16. Minister of Energy and Mineral Resources;
17. Cabinet Secretariat.

Local

SEZ Local Council

SEZ Administrator

Local Council Secretariat headed by Provincial Secretary (ex-officio)

Development and Management Business Entity

Businessmen

Figure 2. SEZ Institutional
Source: http://www.kek.go.id

Government Regulation Number 40 of 2021 (2021) explains that the DMBE can be state-owned, regional, cooperative, private, or joint venture/consortium. Business entities also play a role in proposing SEZ locations, which must pass through approval stages starting from district/city, provincial to central. If the proposing business entity makes the application, the National Council determines the proposing business entity to become the DMBE for the SEZ.

The DMBE plays a role in implementing sustainable management and development in line with national SEZ development goals. It has also determined several strategic steps to optimize resources, including absorbing local workers and attracting foreign investors to enhance the regional economy. Additionally, the DMBE can engage in

Singhasari Tourism Special Economic Zone: Can it Survive in Today's World Economy?
Anisah et al. (2024)

JKi

strategic cooperation with the government to implement policies aimed at optimizing SEZs, such as providing facilities and fiscal incentives.

From an institutional perspective, aside from the Development and Management Business Entity, there is a body responsible for providing licensing service facilities required by the Development and Management Business Entity. This body also supervises and controls the implementation of the SEZ, as outlined in Article 58 Government Regulation Number 40 of 2021 (2021). When the management has yet to be formed, the supervision and operational control of the SEZ are carried out by the operational acceleration team, which was formed at the beginning of the establishment of the Singhasari SEZ. Until the end of 2022, licensing services were being handled by the Department of Investment and One Stop Integrated Services Malang Regency. This will continue until the management is appointed by the National Council for Special Economic Zones by Government Regulation Number 40 of 2021.

The development of a SEZ relates to the capacity of the area manager. SEZ Singhasari was built and managed by a limited liability company, formed by members or affiliates of the company consortium, namely Indonesian Tourism Development, Ltd, Intelegensia Grahatama, Ltd, and Archipelago Mandala Horizon, Ltd. This business entity operates in conjunction with the SEZ institution.

From an institutional perspective, the formation of the Singhasari SEZ has followed the established procedures, involving all relevant institutions in their respective roles. According to Chaisse and Ji (2020), Mugano (2021), as well as le Roux and Schoeman (2016), there is no uniform SEZ institutional model across countries. However, there are similarities between the main SEZ stakeholders, such as the government, SEZ authorities, area developers, area operators, and area users.

At the beginning of its establishment, the DMBE for the SEZ Singhasari was managed by a consortium of companies, namely Pembangunan Wisata Indonesia, Ltd, Intelegensia Grahatama, Ltd, and Cakrawala Mandala Nusantara, Ltd. This consortium was formalized through a notarial deed, resulting in the designation of Intelegensia Grahatama, Ltd, as the DMBE for the Singhasari SEZ.

Despite not being a part of the SEZ institution, the Operational Acceleration Team, formed by the Regent, continues to offer support and assistance in the development of the Singhasari SEZ. One of them is collaborating with Regional Drinking Water Companies to ensure access to drinking water capable of serving international-scale campuses. Additionally, the Operational Acceleration Team, in collaboration with the Ministry of National Development Planning, continues to strive to ensure that providing access to drinking water can become a Government Collaboration with Business Entities.

Obstacles to the Singhasari SEZ: Lessons from the Experience of Other Countries

The development of SEZ has shown mixed results, emphasizing the need for tailored approaches based on regional specifics and a well-defined operational framework for success. It is essential to delineate clear roles and responsibilities between the government and the private sector. Challenges in SEZ development include determining the legal and regulatory framework, planning and assessing business feasibility, and providing adequate infrastructure (Zeng, 2015).

According to Aggarwal (2019), the success of SEZ depends on three pillars: a well-defined strategic approach, strategic dynamism, and strategic implementation. Initially, a

strategic approach involves determining the focus of SEZ activities. For example, the Republic of South Korea established a manufacturing-oriented SEZ, effectively attracting foreign investors in the export-oriented light industry. This strategic plan aims to generate the foreign exchange required for import substitution programs, obtain a large amount of highly educated labor, promote exports, give access to innovative technologies, and boost light manufacturing competitiveness without creating a threat to local companies (Aggarwal, 2019).

Taiwan adopted an approach to strengthen its development strategy towards SEZs based on export processing zones. SEZ in Taiwan province focuses on Small and Medium-sized Enterprises (SMEs) in the light consumer sector and utilizes export processing zones to enhance technological advancement in the early stages of its development. The government employs a proactive and reactive policy framework, encouraging collaboration between Export Processing Zone (EPZ) companies and non-EPZ companies to promote subcontracting and local procurement. Under the proactive approach, the government provides small companies with targeted subsidies, import protection, credits, and incentive packages to support small businesses in enhancing their productive capacity. By facilitating access to new technologies, skills, capital, and markets globally, integration with the global value chain strengthens the technological competitiveness of these small businesses. Following the integration into the global value chain, these companies shifted from assembling imported raw materials to increasing local production and procurement as original equipment manufacturers (OEM), to original design manufacturing (ODM), and selling their own branded products known as Original Brand Manufacturing (OBM) (Aggarwal, 2019).

These two countries show that the success of the Singhasari SEZ will be contingent upon the strategic selection of its business type. The decision to focus on the tourism sector within the Singhasari SEZ is well-founded, given its advantageous location in the historic territory of the ancient Singosari Kingdom, the oldest kingdom in the region. Several countries including Bangladesh, China, Lao People's Democratic Republic, Malaysia, and the Russian Federation have established Special Economic Zones (SEZs) to promote tourism and tourism-related industries. Tourism SEZs offer similar advantages as SEZs in the manufacturing sector. However, it is important to recognize that in the context of tourism, which often involves naturally beautiful or culturally rich locations, many countries rely on general incentive programs, the development of remote and underdeveloped regions, or other clustering methods rather than utilizing SEZs as a policy tool to support this industry (UNCTAD, 2019). Countries utilize SEZs to enhance tourism for several reasons. One reason is that tourism areas, due to their limited and homogeneous nature, provide an optimal framework for the integrated development of resort and recreational facilities. Furthermore, according to UNCTAD (2019), tourism areas can serve as a means for attracting foreigners, providing environmental protection, and supporting sustainable as well as environmentally friendly development, including ecotourism. These objectives can be managed well in limited SEZ areas compared to national areas in general.

Given the compelling focus on the reasons mentioned above, it is understandable why Singhasari SEZ choose the tourism sector. Singhasari, as the site of Indonesia's oldest kingdom, is rich in historical artifacts and museums. However, this decision was proven to be ill-timed. The COVID-19 pandemic, which persisted for 3 years, led to a halt in tourism

Singhasari Tourism Special Economic Zone: Can it Survive in Today's World Economy?
Anisah et al. (2024)

Jki

activities. Consequently, the DMBE promptly pivoted towards digital education (personal communication, November 28, 2022):

Initially, Singhasari SEZ operated in the tourism sector under government regulations. During the early stages, Intelligensia Grahatama, Ltd, which was later designated as the Development and Management Business Entity through a Regent's Decree, aimed to develop its tourism zone due to its attraction. However, the onset of the COVID-19 pandemic altered the dynamics, leading to investor withdrawals and making it difficult to sustain tourism-focused activities. Therefore, we focused on the other zone, where the activities were more about digitalization. Then the Development and Management Business Entity developed an animation village, collaborating with companies that focus on digitizing animation. (personal communication, November 28, 2022)

Currently, Intelegensia Grahatama, Ltd and the Malang Regency government collaborate under their respective duties and limits of authority. Intelegensia Grahatama, Ltd collaborates with the University of Indonesia and Brawijaya University to provide assistance and training to animators. Additionally, the Malang Regency Education Office has initiated efforts to regenerate high-quality animators by engaging guardians of elementary and middle school students in the area and providing outreach about the animation program at the vocational school level within the Singhasari SEZ.

Secondly, strategic dynamism is crucial. Adapting business strategy, including the type of business, is essential for development during various situations. As carried out by the DMBE Singhasari SEZ, shifting the type of SEZ business from tourism to digital education was a response to changes brought about by the COVID-19 pandemic. Taiwan has also changed its SEZ strategy over time by strengthening its development strategy through SEZs. Taiwan achieved success by pioneering an innovative industrial incubator model with its Export Processing Zone (EPZ), which led to various transformations in the country's industrial structure of the country while it was being developed. In the late 1970s' EPZs were upgraded to attract capital-intensive activities to align with economic restructuring throughout the economy of Taiwan. Subsequently, in the late 1980s, EPZs transitioned towards accommodating high-tech industries, followed by a shift towards logistics industries in the 1990s. Therefore, SEZ companies can establish relationships with domestic producers and further improve their capabilities because the country has domestic capabilities (Aggarwal, 2019). This helps develop a two-way relationship between EPZ and non-EPZ companies. Thus, EPZ investors have become important customers for Taiwanese companies outside the zone. Presently, China's Taiwan Province has ten EPZs and six logistics-oriented Free Trade Zones clustered into two growth poles, Kaohsiung and Taichung. These poles are further bolstered by diverse science parks and industrial estates, serving as pivotal centers driving economic dynamism within the region (Aggarwal, 2019).

The third is strategic implementation. Strong political support is also necessary for the SEZ to succeed in order to transform the prepared strategies into implementation. As Aggarwal (2019) stated, the success of China, Taiwan, and Korea indicates that the political policies issued are pro-investors. In addition to providing large tax incentives and reducing import duties on imports, the government is also paying attention to good infrastructure development. A large amount of funding was injected for infrastructure development. In

addition, the three countries are also investing in human resources as well as improving and strengthening the quality of institutions.

In Indonesia, SEZ institutions involve the roles of both the government and private sector, which makes SEZ institutions complicated. Empirical evidence indicates that SEZ institutions are influenced by certain economic, political, regulatory, and constitutional systems. Within the context of a Unitary State in Indonesia, the Central Government is the main stakeholder responsible for managing overall economic development, developing policies, and coordinating SEZ policies with other related policies. To support the Central Government, regional governments serve as SEZ land owners, mandated to pay attention to the interests of the region and its populations. Frequently, central government policies are different from the targets of regional governments, and vice versa.

Similar to other countries that establish tourism SEZs, infrastructure development is crucial to support and facilitate accessibility to these areas. Relying solely on regional government budgets, certainly, necessitates that infrastructure projects be undertaken on a manageable scale. This requires political decisions at the central level. Budget allocation from the central government for infrastructure development is essential. However, there has been insufficient attention to infrastructure development in the Singhasari SEZ. The issue was highlighted in an interview with the Regency of Malang's Regional Government on November 28, 2022. The officials stated that the Regency of Malang's Regional Government needs support from the Province of East Java's Regional Government and the Central Government. Several concerns were expressed regarding the initiatives, including the upgrade of Abdurrahman Saleh Airport in Malang to meet an international standard airport and the inadequate road access to the SEZ, which fails to meet necessary dimensional requirements. The area is not located along the main road, Singhasari-Surabaya main highway, but approximately 2 kilometers away, passing through residential areas. Enhancing the access quality is challenging due to the presence of settlements and traders on the route. Moreover, tax incentives from the provincial government, which have yet to be established, are crucial for the advancement of the Singhasari Special Economic Zone. The Singhasari SEZ Development Team and the Malang Regency Spatial Planning Service have made efforts to secure the SEZ to prevent friction, such as detaining investors who want to create tourist attractions around the Singhasari SEZ.

We really need support from both the provincial and the central government for this. From the list of action plans for us, we have done everything. What needs to be improved is only minor, such as water infrastructure. However, our demands for the central government, such as the internationalization of Abdurrahman Saleh Airport, remain unfulfilled. Furthermore, there is no provision for that access either. ... The entrance to the SEZ remains difficult to navigate. Many aspects are beyond our jurisdiction and require external support, such as regional regulations regarding incentives. Taxes are not only imposed at the district level; there are other taxes at the provincial level. "Well, there is nothing from the Province to provide easy incentives. (personal communication, November 28, 2022)

This issue has persisted for a long time, as explained by the Malang Regency Culture and Tourism Office in 2011-2015 (Amiruddin et al., 2021). The issues regarding heritage tourist attractions in the Singhasari area include the poor transportation infrastructure to reach tourist attractions, the insufficient community involvement in the

Singhasari Tourism Special Economic Zone: Can it Survive in Today's World Economy?
Anisah et al. (2024)

Jki

development of heritage tourist attractions, a lack of integrated planning between heritage tourist attractions, and the inadequate management of heritage tourist destinations when it comes to packaging tourist attractions into products and tour packages. Due to insufficient investment, this historic landmark has not been managed optimally. Additionally, the limited budget for the Malang Regency Culture and Tourism Office poses significant challenges for conducting exploratory research in new locations (Krisnawati & Suprihardjo, 2014). The infrastructure limitations faced by the Singhasari SEZ are particularly unfortunate, considering that the main objective of the SEZ program is to overcome such obstacles to enable the business sector to operate efficiently (Zeng, 2021). SEZs are expected to support market forces by addressing market failures such as insufficient industrial infrastructure and non-functioning land markets (such as land scarcity, ownership disputes, and settlement difficulties). Providing a conducive environment for the business sector is crucial (Farole, 2011), which includes the provision of good infrastructure (Frick et al., 2019) such as electricity, water, roads, and telecommunications (Zeng, 2021). These services increase a zone's appeal, thereby fostering zone expansion (Frick et al., 2019). To maximize the benefits of infrastructure development, it is imperative for management to collaborate with central government and regional governments. Strong collaboration in infrastructure development will yield significant impacts and benefits by facilitating access to the SEZ zone and connectivity between the SEZ and the surrounding community's economy (Adam, 2019).

Therefore, the delineation of roles among various parties as stipulated in the regulations should be effectively implemented. This aligns with Farole (2011) perspective which elucidates the roles and responsibilities of stakeholders in SEZ: (1) The government bears the responsibility for strategic planning, determining locations, making land use guidelines, conducting initial feasibility studies, developing infrastructure, providing training/development workforce, and establishing SEZ regulations; (2) Regulators facilitates government services such as licensing, monitoring compliance, and designating government and private land as SEZ areas. They also designate government or private landowners as SEZ developers or managers; (3) The developer is responsible for finalizing the land use plan and preparing the land, such as leveling and other pre-construction, providing infrastructure such as drainage, waste disposal systems; (4) The operator is responsible for managing facility rentals with investors, ensuring the provision of utilities at the location, and conducting marketing activity such as promoting new SEZ opportunities.

In addition to effectively depicting the situation in the Singhasari SEZ from the perspective of the 3 key pillars of SEZ success, the research conducted by UNCTAD (2019) also underscores the importance of assessing the success of SEZs beyond quantitative growth and dynamic goals. It emphasizes the inclusion of social goals in the evaluation process. Almost 2/3 of SEZ policies worldwide (61 percent) indicate that the goal of SEZ is quantitative growth, followed by dynamic goals. Quantitative growth focuses on objectives such as attracting investment, promoting exports, and creating jobs. Conversely, dynamic growth aims to promote innovation, industrial upgrading, knowledge transfer and skill development, economic diversification, structural transformation, and integration into local value chains (Mugano, 2021).

Several theories analyze the success of SEZs from the perspective of the impact of SEZ formation. Neoclassical theory Baissac (2011) explains the pessimistic view towards

SEZ implementation, which only focuses on the economy. This view is further reinforced by the opinion of the World Bank, which states that the evaluation of SEZ emphasizes two main factors, including: 1) The main impact of SEZ on the economy and 2) The main impact of SEZ on economic reform.

Despite the early association of SEZs with worker maltreatment, in the early phases of growth, they served as useful instruments for absorbing extra labor. As a result, the formation of SEZs only appears to be successful in earning foreign exchange and absorbing labor. However, it has not fully addressed the broader aspects of the economy. Supporting this view, The World Bank provides an analysis and evaluation of SEZs concerning their welfare impacts, which include 1) increasing national income and 2) creating efficiency and economy, which is achieved through various policies.

Another perspective, advocated by Heterodox (Baissac, 2011), known as New Growth Theory and Neo Institutional, deviates from traditional trade theories in analyzing SEZ formation. This viewpoint underscores the transfer of science and technology in SEZ establishment. New Growth Theory explains that apart from economic factors, social and political factors determine the allocation of capital and labor. In other words, the level of welfare is determined not only by economic factors but also by social aspects that evolve following the accumulation of human resources. Furthermore, Neo Institutional focuses on increasing productivity and efficient utilization of production factors within a country. Developing countries experience a productivity gap in which labor is not immediately absorbed, despite the presence of competitive advantages. Therefore, technology distribution is the main key to anticipating productivity gaps. This implies the optimistic side of Heterodox's view, where one of the positive impacts of the formation of SEZs is technology transfer (Baissac, 2011).

Reflecting on views related to Heterodox, the success of the Singhasari SEZ should also be assessed from a socio-political perspective. The local community must perceive the presence of the Singhasari SEZ. The lack of involvement of the local community in the development of the Singhasari SEZ was acknowledged by the Malang Regency Regional Government (personal communication, November 28, 2022). The local community is best positioned to recognize the potential and opportunities that Singhasari has to offer and anticipate negative impacts. The involvement of local communities can make the Singhasari SEZ a sustainable tourism that improves the economic, social, and cultural welfare of local communities (Amiruddin et al., 2021).

CONCLUSION

The policy of establishing the Singhasari SEZ in Malang Regency has shown less than optimal results. This is based on the consideration that the Singhasari SEZ has not succeeded in improving the economic, social, and cultural welfare of the local community. Viewed from the strategic perspective, the Singhasari SEZ's obstacles to choose the type of tourism business have been negatively impacted by the COVID-19 pandemic. Based on the perspective of strategic dynamism, the decision of the Development and Management Business Entity to change the type of business from tourism to digital education reflects an adaptive response to developments in the post-COVID-19 pandemic situation. However, it is important to note that such changes must be based on a well-defined strategic approach. Short, medium, and long-term threats must be mapped. Furthermore, strategic

Singhasari Tourism Special Economic Zone: Can it Survive in Today's World Economy?
Anisah et al. (2024)

Jki

implementation requires a political role, including state leaders and decision-making elites, both at the central, provincial, and district levels. Even though the Singhasari SEZ has focused on digital education, the role of the central government in infrastructure development is highly anticipated.

In the institutional governance of the Singhasari SEZ, all institutions have fulfilled their roles according to procedures. The success of the Singhasari SEZ hinges not only on formal institutional involvement but also on informal institutions, particularly in politics and local community engagement. Community participation as the party closest to the SEZ area can provide adequate information regarding regional potential and contribute to regional development.

The research also proposes the view that evaluating the success of a SEZ should not solely be done from an economic perspective but it must also employ a social perspective. In addition to looking at its contribution to the economic development of a region, SEZ must also evaluate its impact on the social life of its people. How a green economy is developed in the tourism industry, for example, or how the sustainability of people's lives in SEZs is maintained through the presence of SEZs, without unlimited exploitation. This is evident in the contentment of individuals residing within the SEZ, as the environment is upheld and a way of life is fostered that reveres the moral and cultural tenets of the indigenous community.

The research underscores the policy implications, emphasizing the necessity of collaborative engagement among various stakeholders to optimize SEZ Singhasari activities. This includes the collaboration between the Development and Management Business Entity, central and regional governments, and also the community. The challenges encountered in developing SEZ Singhasari activities, particularly in infrastructure, warrant focused attention from the Central Government to facilitate improved progress within the SEZ Singhasari. Focused attention from the central government such as allocating special funds can be generated for infrastructure development, especially road access and the release of the land needed.

Second, amidst current state budget constraints, prioritizing the involvement of the private sector and society is imperative. Therefore, the central government and regional governments must be able to show the advantages of the Singhasari SEZ to the private sector and open up space for the community to participate actively. This could entail actively involving start-up companies in promoting Singhasari's educational and cultural tourism through diverse platforms, thereby fostering broader participation in managing the Singhasari SEZ.

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153

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SUSTAINABLE TOURISM IN SOUTHEAST ASIA: BALANCING ECONOMIC GROWTH, EMPLOYMENT, AND CARBON EMISSIONS THROUGH EVIDENCE-BASED STRATEGIES

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Article Info	Abstract
	Tourism, one of the world's fastest-growing industries, can boost GDP and create jobs. Southeast Asia ranks third among the thirteen tourism markets. 125.78 million visitors are expected annually. This industry contributes 12% of GDP and 4% of employment. However, tourism and related services have increased global carbon emissions from transportation, electricity, and housing. Since the UN's SDGs encourage tourism as a green growth industry to reduce carbon emissions, the ASEAN Socio-cultural Community (ASCC) Blueprint 2025 promotes environmentally sustainable cities. Consequently, this study uses panel data regression to examine tourism's effects on economic growth, employment, and carbon emissions. The findings can then provide a numeric assessment of the SDGs and the ASCC Blueprint 2025. This study uses 2002–2019 World Bank data from 11 Southeast Asian nations. The results reveal that GDP, employment, and carbon emissions are best modelled by the random effect and fixed effect models, respectively. We also find that tourism positively impacts GDP ($p<0.001$), employment ($p<0.008$), and carbon emissions ($p<0.001$). These models estimate that 22,000 international tourists will increase employment by 6.14% and generate \$894 million in revenue. However, it will increase annual carbon emissions by 27 million. These findings suggest Southeast Asian governments, policymakers, and others should promote sustainable eco-tourism to boost economic development and green job creation by reducing carbon emissions. The government should incentivize the local community, as the tourism industry's primary actors, to promote awareness about these programs by implementing low-carbon technology and eco-friendly energy sources.

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INTRODUCTION

Tourism is a rapidly growing sector worldwide, offering substantial potential to boost GDP and create employment opportunities (Yong, 2022). The United Nations World Tourism Organization (UNWTO) has projected that in 2030, there will be 2 billion international tourists, generating an annual revenue of USD 2 billion worldwide (UNWTO, 2011). The UNWTO Publication 2012 also stated that the ASEAN region was again recognized as the fastest-growing international tourist arrivals worldwide. Additionally, Southeast Asia ranks third among thirteen regions worldwide in its tourism industry (UNWTO, 2012). Southeast Asia is also recommended as the most tourism-friendly regions by the World Economic Forum (2022). The estimated annual visitor count is expected to reach 125.78 million, reflecting a growth of 65.9%, equivalent to approximately 82.99 million foreign tourists (WTTC, 2019).

Zaman et al. (2016) argue that tourism promotes economic development. According to the most recent data from the World Travel and Tourism Council (WTTC), the travel and tourism industry significantly impacts Gross Domestic Product (GDP), amounting to $8,272.3 billion (WTTC, 2019). Moreover, there is projected to be a growth rate ranging from 10.4% to 11.7% by 2028. In Southeast Asia, the tourism industry contributes 12% to the region's GDP and expected to increase to 13% over the next decade (Ahmad et al., 2019). Tourism has also substantially generated 20% of the global workforce in the last ten years (WTTC, 2021). This business will create over 100 million job opportunities within the next decade. In Southeast Asia, the tourism industry accounts for 4% of the overall labour force and is projected to experience a 3% annual growth rate in the next ten years (WTTC, 2022).

However, the growing demand for tourism and its associated services has resulted in heightened energy use, contributing significantly to the global rise in carbon emissions from sectors such as transportation, electricity consumption, and residential areas (Bento & Moutinho, 2016). As of 2020, tourism accounts for approximately 8% of the world's greenhouse gas emissions (Jiaqi et al., 2022). The transportation sector is responsible for 75% of these emissions in the tourism business, while the accommodation sector contributes 20% (IPCC, 2014). Cetin et al. (2018) discovered a persistent correlation between tourism-generated income and carbon emissions, particularly during structural disruptions. Additionally, Bojanic and Warnick (2020) observed that countries with a more significant proportion of tourism in their GDP exhibit higher levels of greenhouse gas emissions compared to nations with minimal or no contribution from tourism to their GDP.

Several studies have examined the influence of tourism on economic development in Southeast Asia, including its impact on GDP and the employment rate (Benanav, 2019; Benjamin et al., 2014; Manzoor et al., 2019). Yong (2022) contends that tourism has a lasting impact on the currency rate. Manzoor et al. (2019) provide additional evidence to support this claim, illustrating tourism's positive and significant impact on sustained economic expansion and job creation. The increase in tourism activities, on the other hand, carries the possibility of causing ecological damage (Fernández et al., 2019). Croes et al. (2021) found a negative and indirect relationship between tourism specialization and human development. Furthermore, Ahmad et al. (2019) provided evidence in their study that tourism harms the environment, particularly concerning carbon emissions, in Indonesia, the Philippines, and Vietnam. Additionally, Lee and Brahmasrene (2013)

conducted a study to analyze the dynamic effects of tourism on the ecological and economic development in Southeast Asia between 1988 and 2011. Their research has established that tourism has a persistent impact on economic growth and, if not adequately controlled, can lead to environmental consequences. Hence, Southeast Asian governments must adopt proactive strategies to mitigate the adverse impacts of the surge of tourists.

The ASEAN Socio-cultural Community (ASCC) Blueprint 2025 aligns with the sustainable development goals (SDGs) of the United Nations by placing particular emphasis on advancing tourism as an environmentally sustainable industry that drives economic growth (The ASEAN Secretariat, 2016). The primary objective of this policy is to reduce carbon emissions and promote the development of environmentally sustainable cities. The program utilizes several tactics, including promoting cooperation across relevant sectors, to guarantee the accessibility of clean land, air, water, sanitation, and environmentally friendly public spaces. Furthermore, it aims to enhance the interrelationships among beneficial economic, social, and environmental factors across all domains.

To minimize the negative impacts of tourism growth while maintaining natural, economic, social, and environmental balances, it is imperative to foster stakeholder cooperation involving the government, communities, local residents, and tourists (Haribudiman et al., 2023). While previous studies have examined the impact of the tourism sector on various elements such as economic growth, ecological harm, and employment generation, only some have explored the simultaneous influence of tourism development on these aspects. However, it is crucial to delve deeper into these impacts to amplify the positive effects and mitigate the negative ones effectively. Therefore, this study aims to analyze the influence of tourism on economic growth, employment rates, and carbon emissions across all Southeast Asian countries using panel data regression. Subsequently, we will project how tourism growth will affect GDP growth, employment rates, and carbon emissions, while also comparing conditions in Indonesia with other Southeast Asia countries. Finally, we will provide recommendations for achieving sustainable tourism development in Indonesia in the future. The data obtained can then be used to evaluate the Sustainable Development Goals and the ASEAN Socio-Cultural Community Blueprint 2025, quantitavely.

METHODOLOGY

This section will examine the data and methodology utilized in the empirical inquiry. This study employs a quantitative analysis of secondary data sources from the World Bank. We utilize time series data encompassing 2002 to 2019, obtained from eleven Southeast Asia nations (World Bank, 2020). The independent variable is the logarithm of inbound tourism, representing the number of foreign visitor arrivals. The models incorporate GDP, employment rate, and carbon emission as dependent variables. GDP encompasses economic activity directly associated with tourism, including accommodations, air transport, dining establishments, and recreational industries (Loayza, 2016). We calculated GDP in US dollars and adjusted it for inflation in 2015. We also determined the employment rate, which represents the ratio of employed individuals to the total population aged 15 and above, using estimates from the International Labour Organization (ILO, 2011). The employment rate in the tourist sector, directly and

indirectly, reflects labor absorption (ILO & WTO, 2009). Carbon emissions, measured in millions, refer to the quantity of carbon released due to various tourism activities (World Bank, 2019). Table 1 provides additional information regarding the variables and their sources.

Table 1. Research Data and Variables

Variable	Source	Panel Data
Gross Domestic Product (Constant 2015 USD)	World Bank Data	
Employment Rate (Rate to population ratio, 15+, ILO estimates)	World Bank Data	Time series of 2002-2019 from eleven nations of the Southeast Asia (Brunei, Cambodia, Timor Leste, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam
Inbound tourism (Number of international tourist arrival)	World Bank Data	
Carbon Emission	World Bank Data	

Source: World Bank, 2019, 2020, 2022

This study employs both descriptive and statistical approaches for analysis. Descriptive analysis tables examine the spread of tourism in Southeast Asia and present the findings succinctly (Cleff, 2019). Additionally, panel data regression is employed to determine the impact of tourism on economic growth, employment rate, and carbon emissions in each model (Torres-Reyna, 2007).

Panel data regression is an econometric model integrating cross-sectional data from 11 Southeast Asian nations and time series data from 2002 to 2019. The predictor variable in this model is log tourism, while the response variables are log GDP, log CO_2, and employment rate. The purpose of applying a logarithmic transformation to the variables representing the number of tourists, GDP, and CO_2 is to standardize their ranges within each country, as significant variations exist among countries Conversely, the employment rate does not undergo a logarithmic transformation since its values uniformly span from 0 to 100 across countries. The following equation defines this regression model.

$$y_{it} = \alpha + \alpha_i + x_{it}\beta + \varepsilon_{it} \qquad ...(1)$$

Where:
$\alpha =$ constant
$\beta =$ parameters from the estimation result
$x_{it} =$ the it-th observation from the explanatory variable
$\alpha_i =$ different individual effects for each i-th individual
$\varepsilon_{it} =$ error of regression

During the step of selecting the estimating model, the Common Effect (CE), Fixed Effect (FE), and Random Effect (RE) models are suggested. The common effect model does not consider the variations in time and country, whereas the fixed effect model claims intercept differences may explain disparities among nations. The random effect will estimate the disturbance variable from the temporal and cross-country relationship. Three tests must be conducted to determine the most appropriate model: the Chow test to select

between CE and FE models, the Hausman test to choose between FE and RE models, and the Lagrange multiplier test to decide between RE and CE models (Kneip et al., 2012).

FINDINGS AND DISCUSSION

The Trend of Tourism, GDP, Employment Rate, and Carbon Emissions in the Southeast Asia

The investigation began by graphing each nation according to a range of variables. Indonesia, Vietnam, Thailand, Malaysia, and the Philippines, among other Southeast Asian nations, experienced a rise in carbon emissions, as depicted in Figure 1(a). In contrast, carbon emissions in six other nations, including Myanmar, Singapore, Laos, Cambodia, Brunei, and Timor, had slight increases or even decreases. Indonesia stands out with the highest surge in carbon emissions among Southeast Asian countries from 2002 to 2019, witnessing an approximate per capita rise of 350 million metric tons. This significant increase in carbon emissions is attributed to exponential population growth, leading to an escalating consumption of fossil energy (Rostiana & Rodesbi, 2020). Furthermore, Indonesia ranks sixth as the highest emitter of greenhouse gases, as reported by the World Resource Institute (IMF, 2021).

Both, Thailand and Malaysia rank second, experiencing a substantial rise of approximately 150 million metric tons per capita in carbon emissions. In Thailand, international tourism is the most significant contributor to carbon emissions (Raihan et al., 2023). Meanwhile, Vietnam witnessed a significant increase in carbon emissions, reaching 272 million metric tons. Singapore is the sole country that has achieved a reduction in carbon emissions, decreased from 47 to 29 million metric tons. A study by Zang and Su (2019) indicated that Singapore declined in its CO_2 coefficients (carbon emissions to total energy consumption) from 5.78 kt/ktoe to 2.61 kt/ktoe between 1990 and 2014. Singapore stands out as the only country in ASEAN experiencing a significantly higher GDP growth rate than carbon emissions (Zhang et al., 2020). Singapore serves as a commendable model for emulation, as it has successfully reduced its CO_2 emissions by decreasing carbon and energy intensity (Akram et al., 2020). It reflects Singapore's commitment to adopting low-carbon energy sources and promoting less energy-intensive economic growth (Wójcik-Jurkiewicz et al., 2021).

Throughout the previous 18 years, there has been a general upward trend in the number of visitors in each country. Figure 1(b) illustrates the varying pace of growth in the number of visitors, which varies from less than 5 million to over 30 million tourists. Thailand has experienced the most significant surge in tourist arrivals in the last 18 years, with a staggering increase of about 30 million visitors. Malaysia follows closely behind with a jump of over 10 million tourists. Singapore, Vietnam, and Indonesia also experienced a surge in tourist arrivals, with an additional influx of 10 to 15 million visitors. Thailand's growth in visitor numbers surpassed that of other Southeast Asian countries, with increases of less than 5 million visitors observed in those nations.

(a) Carbon Emissions

(b) The Number of Tourists

(c) GDP
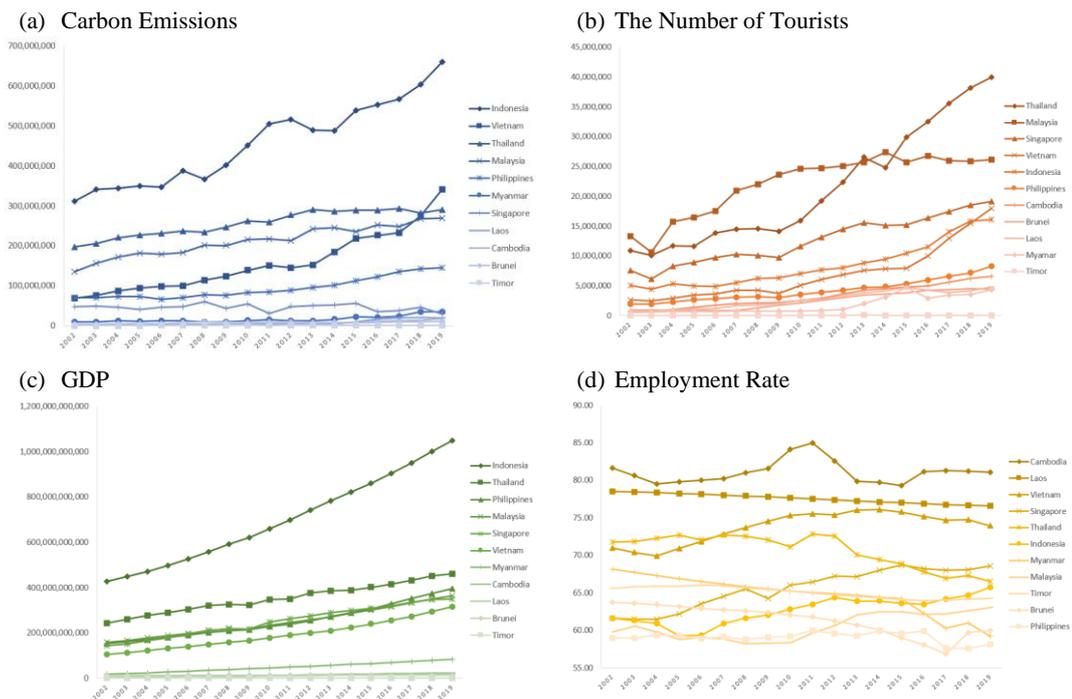
(d) Employment Rate

Figure 1. Carbon Emission, The Number of Tourists, GDP, and Employment Rate for Each Southeast Asia Nation 2002-2019
Source: primary data analysis, 2024

Figure 1(c) depicts the ascending trajectory of GDP in every Southeast Asian country. Indonesia has regained its position as the leading country in GDP growth, with a remarkable 150% increase from 2002 to 2019, rising from 427 billion to 1.05 trillion. Indonesia stands out as the sole Southeast Asian country exhibiting the most substantial increase in GDP, according to these statistics. Thailand, the Philippines, Malaysia, Singapore, and Vietnam have experienced significant GDP growth, ranging from 1.5 to 3 times higher than the period from 2002 to 2019. These countries have a closely aligned trend of economic expansion. Myanmar, Cambodia, Laos, Brunei, and the East are among the nations that often have lower GDP growth rates and a GDP below $100 billion. Moreover, the employment rates in Southeast Asian countries exhibit fluctuate annually. Countries such as Cambodia, Vietnam, Singapore, Indonesia, and Malaysia are experiencing increased in their employment rates. Figure 1(d) shows that employment rates in other Southeast Asian nations declined consistently.

Panel Data Regression of tourism to the GDP, Employment, and CO$_2$ Emission

To examine the influence of tourism on the GDP, employment, and carbon emission, we utilize panel data regression with three different models: the common effect model (specifically, partial least squares), the fixed effect model, and the random effect model. The outcome of each model is documented in Table 2 below.

Table 2. Panel Data Regression for GDP, Employment, and Carbon Emission Models

	GDP Model		Employment Model		CO$_2$ Emission Model	
Common Effect (CE)						
Parameter	Coef.	P>t	Coef.	P>t	Coef.	P>t
Log(Tourist)	0.899	<0.001*	0.119	0.678	1.014	<0.001*

	GDP Model		Employment Model		CO$_2$ Emission Model	
Constant	11.377	<0.001*	59.228	<0.001*	4.970	0.004*
GoF Model	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
F-test	509.170	<0.001*	0.17	0.678	526.02	<0.001*
R-squared	0.722		0.001		0.729	
Fixed Effect (FE)						
Parameter	**Coef.**	**P>t**	**Coef.**	**P>t**	**Coef.**	**P>t**
Log(Tourist)	0.444	<0.001*	0.589	0.008*	0.614	<0.001*
Constant	16.203	<0.001*	66.279	<0.001*	10.966	<0.001*
Rho	0.986		0.943		0.957	
GoF Model	**Coef.**	**P-value**	**Coef.**	**P-value**	**Coef.**	**P-value**
F-test	529.170	<0.001*	7.190	0.008*	308.50	<0.001*
R-squared	0.740		0.037		0.624	
Random Effect (RE)						
Parameter	**Coef.**	**P>z**	**Coef.**	**P>t**	**Coef.**	**P>z**
Log(Tourist)	0.449	<0.001*	0.576	0.008*	0.627	<0.001*
Constant	16.122	<0.001*	66.080	<0.001*	10.777	<0.001*
Rho	0.978		0.948		0.942	
GoF Model	**Stat**	**P-value**	**Coef.**	**P-value**	**Stat**	**P-value**
F-test	539.660	<0.001*	7.08	0.008*	324.60	<0.001*
R-squared	0.740		0.037		0.624	

Note: *Significant at the 5% level
Source: primary data analysis, 2024

Within the framework of the GDP model, the three-panel data regression model produces statistically significant coefficients for both the constant term and the logarithm of tourist numbers (p<0.001). The F-test conducted on the fixed effects (FE), random effects (RE), and common effects (CE) models confirms that all the coefficients in the model are significantly different from zero, indicating that all three models are valid. Both fixed effects (FE) and random effects (RE) models have greater values for the coefficient of determination (r-squared) in comparison to the constant effects (CE) model. The interclass correlation coefficient (rho) for fixed effects (FE) and random effects (RE) models is 98.6% and 97.8%, respectively. It indicates that 98.6% and 97.8% of the variability in the output may be ascribed to the variations among countries.

The employment model produced a precise result. The t-test conducted for the CE model showed statistical significance solely for the constant term. However, the FE and RE models demonstrated statistical significance for all parameters. The criterion results in a statistically insignificant f-test for the CE model (p=0.678) and the lowest r-squared value. The t-test, f-test, and r-squared values for both the fixed effects (FE) and random effects (RE) models exhibit high similarity. The interclass correlation indicates that the differences between countries explain 94.3% (for the FE model) and 94.8% (for the RE model) of the variability in the output.

The carbon emission model encompasses all CE, RE, and FE models essential characteristics. All three models demonstrate significant f-test findings, suggesting that each model is adequately competent for selection. CE has the highest r-squared value, showing that the CE model performs better than both the FE and RE models. The interclass correlation indicates that 95.7% (for the FE model) and 94.2% (for the RE model) of the variability in the output can be ascribed to the differences between countries.

After analyzing each model outlined above, we choose the best model for each response variable using the Chow, Hausman, and Lagrange Multiplier tests, as shown in

Table 3. The data suggest that the random effect model is optimal for assessing GDP and employment. The Lagrange Multiplier test yields statistically significant results with p-values less than 0.001. On the other hand, the Hausman test results are not statistically significant, with p-values of 0.601 and 0.725, respectively. The fixed effect model is often regarded as the most appropriate model for assessing carbon emissions, as demonstrated by the highly significant results of the Chow and Hausman tests, with p-values below 0.001 and 0.004, respectively.

Table 3. Testing for Choosing the Best Panel Data Regression Model

Model		Chow Test	Hausman Test	Lagrange Multiplier	Best Model
GDP Model	Statistics	772.800	3.62	1365.140	RE
	P-value	<0.001*	0.057	<0.001*	
	Conclusion	FE > PLS	RE > FE	RE > PLS	
Employment Model	Statistics	295.060	0.12	1473.41	RE
	P-value	<0.001*	0.725	<0.001*	
	Conclusion	FE > PLS	RE > FE	RE > PLS	
CO_2 Emission Model	Statistics	277.96	12.53	1323.99	FE
	P-value	<0.001*	0.0004*	<0.001*	
	Conclusion	FE > PLS	FE>RE	RE > PLS	

Note: *Significant at the 5% level
Source: primary data analysis, 2024

After conducting tests to choose the most suitable panel data regression model for each explanatory variable listed in Table 3, we formulate an equation for each model.

$$\text{Log(GDP)} = 16.122 + 0.449*\text{Log(Tourism)} \qquad ...(2)$$

$$\text{The Number of Employment} = 66.08 + 0.576*\text{Log(Tourism)} \qquad ...(3)$$

$$\text{Log(Carbon)} = 10.966 + 0.614*\text{Log(Tourism)} \qquad ...(4)$$

Utilizing this model allows us to forecast that for every increment of 1,000 international tourists, there will be a 3.98% increase in the employment rate and an additional $223 million in revenue. However, this will lead to an annual rise of 4.14 million metric tons of carbon emissions. This study reveals a negative correlation between tourism and carbon emissions, suggesting that increased tourism activities contribute to air pollution and environmental degradation. However, it is essential to note that tourism also has the potential to stimulate economic growth and increase employment rates (Bekun, 2022; Raihan & Voumik, 2022).

This assertion is substantiated by research conducted by Akadiri et al. (2020), which illustrates that a mere 1% rise in the number of international visitors coming to a country will result in a significant 4.1% expansion of the economy and a corresponding 1.29% increase in carbon dioxide emissions per person. A study conducted by Raihan et al. 2023) in Thailand found that a 1% increase in tourism leads to a corresponding 0.05% rise in CO_2 emissions. (Hieu & Yen, 2019; Shahzad et al., 2017) also support this paradigm, as their studies state that tourism is a prominent and influential sector that substantially impacts on employment in Southeast Asia.

Subsequently, we will assess the influence of tourism on the GDP, rate of employment, and carbon emissions across various nations. While acknowledging the existence of country-specific factors, varying rates of development, and constraints that influence changes in tourism numbers, we will overlook these distinctions to provide a broad understanding of the tourism model. Assuming a consistent yearly growth rate of 2.5% for tourism numbers in all nations, we may anticipate the rise of GDP, carbon emissions, and employment rate, as depicted in Figure 2-4.
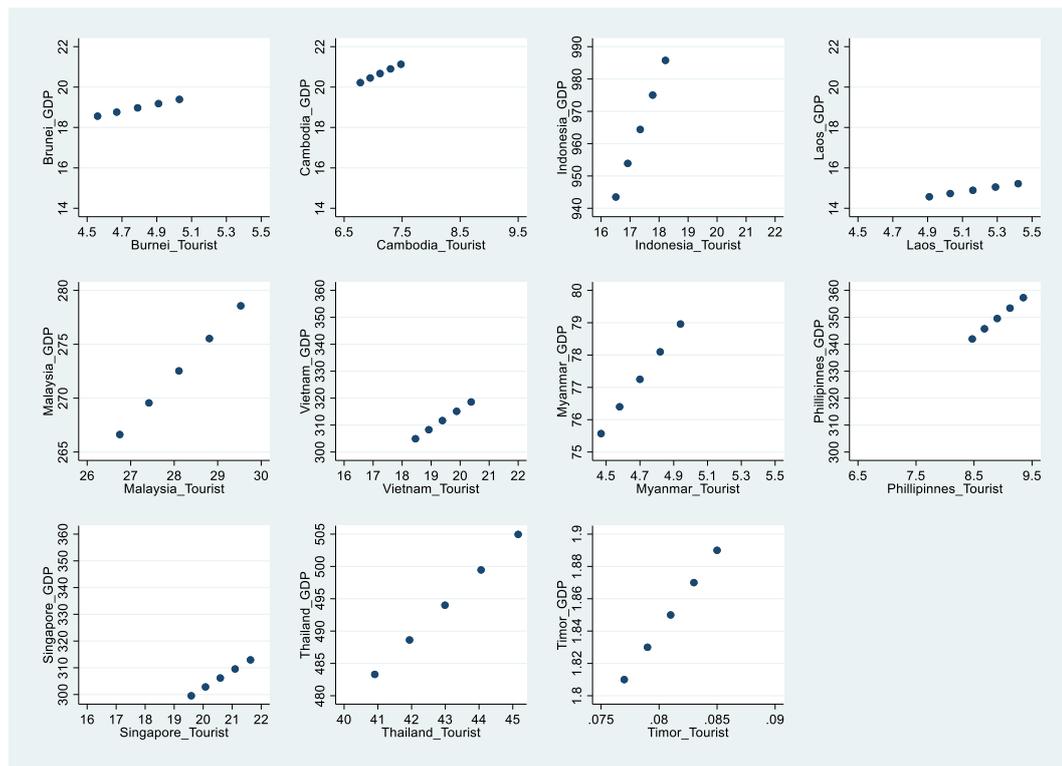
Figure 2. Forecast of the Number of Tourists (in millions) and GDP (in billions) for 2023-2027 for Each Country in Southeast Asia
Source: primary data analysis, 2024

According to Figure 2, assuming a yearly growth rate of 2.5% in tourist arrivals, the Southeast Asian nations that would have the most remarkable rise in visitor numbers over the next five years are Thailand (4.25 million), Malaysia (2.7 million), Singapore (2.03 million), Vietnam (1.9 million), and Indonesia (1.7 million). Timor, Brunei, Cambodia, Laos, Myanmar, and the Philippines all observe a surge in tourist numbers, with increases ranging from 8,000 to 900,000 visitors. This projection is supported by data from the World Bank, which states that Thailand attracts approximately 40 million international tourists annually, making it the most visited country in Southeast Asia and the 13th most visited globally (Raihan & Voumik, 2022; World Bank, 2022).

Surprisingly, despite experiencing a rise in tourist arrivals by more than 2 million, Indonesia has achieved a more significant increase in GDP compared to Vietnam and Singapore. Indonesia's GDP growth is 42.28 billion, while Vietnam's is 13.66 billion and Singapore's is 13.42 billion, all over the next five years. Additionally, Indonesia's GDP growth surpasses that of Thailand despite Thailand's tourism growth rate being twice as

high as Indonesia's. According to the 2018 WTTC data, Indonesia is ranked 23rd globally in absolute growth, with the tourist sector contributing 5.8% of the total GDP (WTTC, 2019).
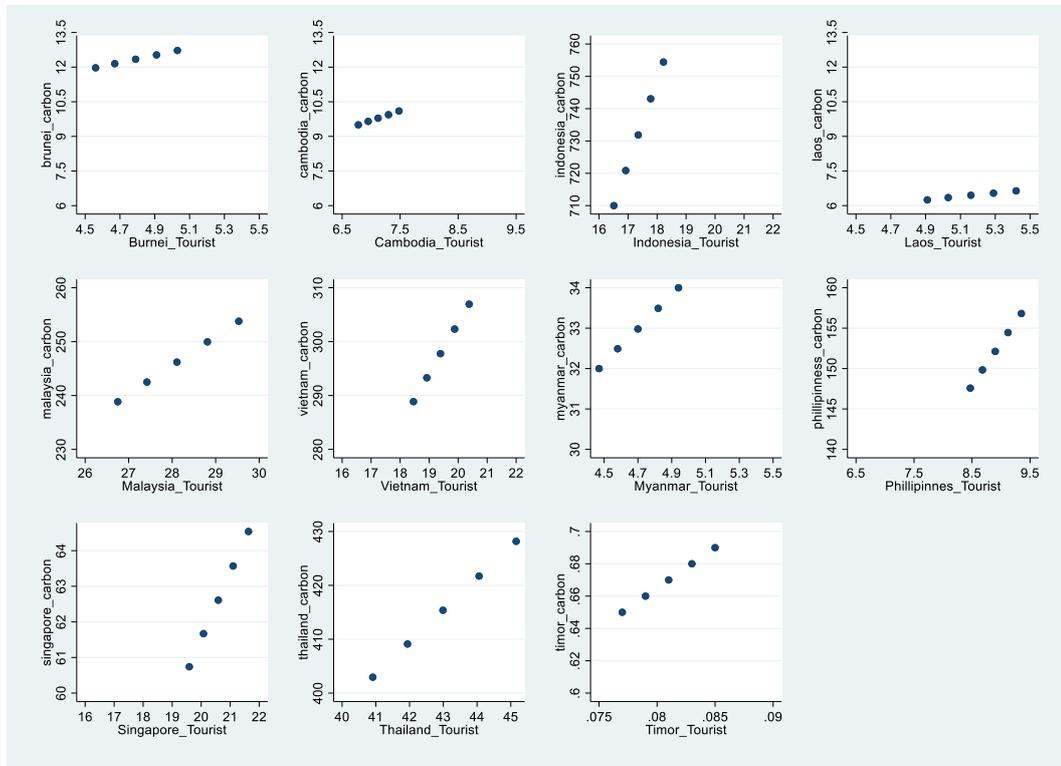
Figure 3. Forecast of the Number of Tourists (in millions) and Carbon Emissions (in millions) for 2023-2027 for Each Country in Southeast Asia
Source: primary data analysis, 2024

Figure 3 illustrates the projected increase in carbon emissions in Southeast Asian nations. Indonesia, Vietnam, Thailand, and Malaysia are expected to experience a substantial increase in carbon emissions over the next five years, with respective estimates of 44.4 million, 25.21 million, 18.07 million, and 14.94 million. The rise in tourist numbers in these countries, originating from various sectors, contributes to the surge in carbon emissions. In their study in Southeast Asia, (Sherafatian-Jahromi et al., 2017) highlighted that tourists' arrivals play a vital role in the emission of pollutants in Malaysia. An intriguing discovery is the anticipated surge in carbon emissions in the Philippines, forecast to reach 9.2 million measures. In contrast, the number of tourists is predicted to increase by only 880 thousand in the upcoming years.
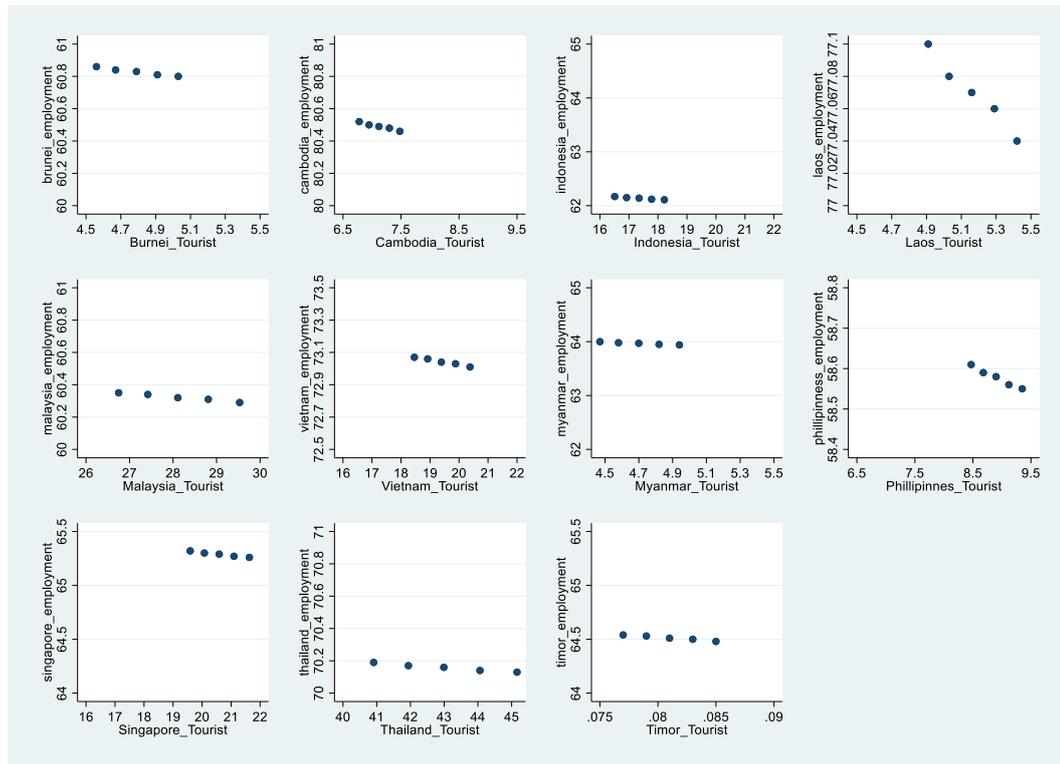
Figure 4. Forecast of the Number of Tourists (in millions) and Employment Rate (%) for 2023-2027 for Each Country in Southeast Asia
Source: primary data analysis, 2024

Figure 4 predicts that the projected increase in tourism numbers is expected to lead to a decrease in the employment rate across all Southeast Asian countries from 2023 to 2027. However, compared to 2002 to 2019, Cambodia, Laos, Vietnam, and Thailand are anticipated to experience an uptick in employment rates over the next five years, reaching 80.5%, 77%,73%, and 70%, respectively. According to the data provided by the WTTC, this industry is projected to see a rise in its total employment contribution from 7.6% to 8% over the next ten years (Manzoor et al., 2019). However, despite the projected rise in tourist arrivals between 700 and 500 thousand, Cambodia and Laos have achieved more excellent employment absorption. Conversely, nations like Indonesia, Malaysia, and Singapore, which see significant increases in tourism, exhibit somewhat lower rates of labour absorption, often ranging from 60% to 65%.

One reason for the differences in projections across various countries is the variation in tourism assets and country-specific environmental conditions. Additionally, geographical context contributes to these differences. Indonesia and the Philippines are archipelagic countries, while Thailand, Vietnam, Cambodia, Laos, and Malaysia are primarily located on the Asian continent. Singapore, Brunei, and Timor are either small island nations or part of larger islands.

Furthermore, the focus of tourism development programs varies among countries, with only a few, such as Indonesia and Thailand, placing significant emphasis on such initiatives. This strategic approach is predicted to lead to substantial growth in tourism, with significant impacts on employment, economic growth, and an increase in carbon emissions (Jermsittiparsert & Chankoson, 2019; Mardhani et al., 2021). The WEF has also

indicated a promising future, with over 100 million international arrivals in Southeast Asia, leading to an average growth rate of 8%, job creation, and the facilitation of regional development (Hieu & Yen, 2019).

How to optimize the tourism effect for the country? Some policy implications

This section discusses various implications for optimizing the impact of tourism in Indonesia through evidence-based strategies drawn from several studies conducted in Turkey, South Asia, and the Asia Pacific region. These strategies, activities, and programs have been demonstrated to be effective based on evaluation research and empirical evidence.

Our projection results indicate a positive outlook for tourism activity and development in Southeast Asia, underscoring the need to effectively promote and expand the tourism sector in the future. It is imperative for governments, legislators, and other stakeholders in Southeast Asia to prioritize efforts aimed at promoting sustainable eco-tourism to mitigate the environmental and climate impacts of tourism. This promotion should not just be a policy but a mission, engaging both public and private sectors in a dynamic partnership that not only provides infrastructure, but also pioneers growth in the tourism sector (Iyer, 2022). A well-coordinated and supervised partnership between the public and commercial sectors is crucial for achieving sustainable growth in the tourism industry (Rasool et al., 2021). The focus of Southeast Asian countries on long-term tourism growth is crucial, given the interplay between tourism development and environmental protection, with the aim of preventing tourism from further deteriorating ecosystems and the environment.

Implementing this sustainable eco-tourism strategy can promote economic growth and create environmentally conscious job by reducing carbon emissions. (Akadiri et al., 2019; Bhattacharya et al., 2017) provide additional evidence to support this claim, as their research in South Asia and Asia Pacific, as well as Turkey, shows that the adoption of effective tourism management and sustainable tourism policies heavily influences the impact of tourism on carbon emissions. One successful implementation of sustainable tourism in Indonesia is the Low Emission Zone (LEZ) policy implemented in the Kota Tua Area (KTA) of Jakarta, which restricts the entry of motorized vehicles in that area (Istanto et al., 2023). This policy has increased tourist satisfaction by 23% and reduce carbon emissions.

Moreover, in several nations projected to witness heightened carbon emissions attributed to the tourism sector, such as Indonesia, the government should establish a comprehensive framework holding residents and tourists accountable for preserving the natural ecology of tourist destinations (Mathew & Sreejesh, 2017). All tourism businesses must implement sustainable practices and prioritize environmental conservation. It will help educate both residents and international tourists about the importance of energy conservation, environmental protection, and adopting eco-friendly practices, even during vacation.

Based on research conducted by (Li et al., 2021) in China, it is evident that the government's encouragement for enterprises to adopt environmentally friendly and low-carbon technologies, along with alternative energy sources, has led to positive outcomes in various tourism-related activities such as transport systems, logistics, and housing. This policy has resulted in a reduction of CO_2 emissions and a decrease in the overuse of

resources. Drawing from this example, Southeast Asian nations, particularly Indonesia, could consider implementing similar policies to mitigate carbon emissions from tourism-related activities.

Another strategy is for the government to offer incentives to local individuals, the primary stakeholders in the tourism industry, to promote awareness of these initiatives through using low-carbon technology and ecologically sustainable energy sources. Turkey exemplifies a nation that possesses a well-defined environmental plan. Their Development Plan effectively manages and reduces the use of non-renewable energy in residential, transportation, industrial production, and tourism domains (Akadiri et al., 2020). This policy has a substantial and enduring impact on environmental quality. By promoting and adopting environmentally sustainable practices and investing in alternative energy sources, these countries can contribute to environmental conservation efforts while fostering sustainable tourism development.

To enhance the development of sustainable industrial tourism, it is recommended that financial resources and technical assistance be provided to the local community for the management of tourist attractions. In Indonesia, many tourist destinations have implemented community-based tourism that preserves local wisdom (Bagasta et al., 2021). However, challenges often arise from resource constraints and the need for more technical assistance from the government and related agencies to empower and develop tourism (Andri & Dunan, 2023). Thorough guidance and counselling are essential for creating a secure and conducive atmosphere (Anser et al., 2021). This measure will also positively impact the restoration of natural scenic tourist spots and the reduction of expensive carbon abatement expenses (Umbu et al., 2023).

The objectives above can be achieved with robust political determination, administrative capabilities, explicit mandates, financial resources, and public consciousness of low-carbon living. Establishing a customized policy framework for each country in the region is imperative. Southeast Asia has the potential to implement comprehensive tourist frameworks that will generate strong connections between institutions, organizations, decision-making processes, and established practices. In addition, other factors influences this relationship in Southeast Asian nations, which will aid in developing a plan that promotes social, economic, and environmental sustainability.

CONCLUSION

By utilizing the panel data regression model, this study found a positive and significant impact of tourism growth on the GDP, employment rate, and carbon emission. Overall, for every increment of 1,000 international tourists, there will be a 3.98% increase in the employment rate and an additional \$223 million in revenue. However, this will lead to an annual rise of 4.14 million metric tons of carbon emissions. Based on that model, we project that some Southeast Asian countries will experience the most significant growth in tourist arrivals over the next five years, including Thailand (4.25 million), Malaysia (2.7 million), Singapore (2.03 million), Vietnam (1.9 million), and Indonesia (1.7 million). Indonesia has achieved a higher GDP growth than Vietnam and Singapore despite experiencing a rise in tourist numbers of over 2 million. Indonesia's GDP growth stands at 42.28 billion, while Vietnam and Singapore have recorded GDP growth of 13.66 billion and 13.42 billion, respectively. It is projected that nations like Cambodia, Laos, Vietnam,

and Thailand will witness a rise in their employment rates by around 6% in the next five years, reaching rates of 80.5%, 77%, 73%, and 70% respectively, because of the growing tourism activities. Additionally, Indonesia, Vietnam, Thailand, and Malaysia are expected to have a substantial rise in carbon emissions due to the growth of tourism, with respective values of 44.4 million, 25.21 million, 18.07 million, and 14.94 million. Examining the anticipated growth of Indonesia's tourism industry and its associated rise in GDP, it becomes evident that the sector significantly contributes to increased carbon emissions. Therefore, the Indonesian government must adopt measures promoting sustainable eco-tourism and prioritize environmental conservation. This entails adopting of eco-friendly and low-carbon technologies alongside educational efforts targeting both local communities and international tourists, emphasizing the significance of energy conservation and environmental preservation. These initiatives will facilitate the emergence of environmentally friendly job opportunities and aid in curbing carbon emissions. Lastly, this study has some limitations, including the use of time series data limited to the years 2002-2019, which prevents capturing long-term patterns of the influence of tourism on economic growth, employment rate, and carbon emissions. In addition, the study used a simple panel data regression model, which only examines the causal relationship between tourism (as the predictor variable) and several response variables individually. A future study that constructs a more intricate model of the relationships between variables would be preferable. Another limitation of this research is that the GDP, employment rate, and carbon emission data utilized are aggregated from all sectors and not specifically tailored to the tourism sector. This is primarily due to data constraints, particularly in certain countries where comprehensive data for the tourism sector may be lacking or limited.

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