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Address: **International Journal of Green Tourism Research and Applications**, Politeknik Negeri Bali, Bukit Jimbaran, Badung 80364
Telephone: (+62361) 701981, email: ijogtra@pnb.ac.id.

Principal contact: muhamadnova@pnb.ac.id (phone: +6285792141714)
Support contact: rororietaanggraheni@pnb.ac.id (phone: +6285292793409)

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Exploring Tourist Perceptions of Eco-Friendly Hotels in Bali through Online Customer Reviews

Ni Wayan Chintia Pinaria^{1*}, Ida Ayu Kalpikawati², Putu Mira Pranadewi³

^{1,2} Hotel Management, Politeknik Pariwisata Bali, Indonesia

³ Food and Beverage Service, Politeknik Pariwisata Bali, Indonesia

*Corresponding Author: tia@ppb.ac.id

Abstract: Bali, as an international tourism destination, faces growing sustainability challenges related to overtourism, plastic waste, and environmental degradation, which threaten environmental quality and local cultural preservation. In response, green hotels have been promoted as part of sustainable tourism development. However, empirical research examining how tourists perceive eco-friendly hotel practices through verified online customer reviews, particularly in Bali, remains limited. This study addresses this gap by exploring tourists' perceptions of green hotels in Bali based on verified online reviews. Using a qualitative descriptive approach with content analysis, this study analysed 4,495 guest reviews collected from Booking.com for ten hotels in Bali certified as Verified Green by Eco Tourism Bali. Among these reviews, 207 (4.6%) explicitly contained environmental or sustainability-related themes. Overall, tourists' perceptions of green hotels in Bali were predominantly positive, with the highest appreciation directed toward general green practices, environmentally conscious site design, and sustainable purchasing practices. Word frequency analysis further shows that terms such as sustainable, environment, and eco appeared most frequently, indicating that tourists tend to associate green hotels with a holistic environmental identity rather than isolated technical practices. This study contributes to the literature by providing empirical evidence from verified online reviews on how eco-friendly hotel practices are perceived in a major tourism destination. Practically, the findings offer insights for hotel managers to enhance the visibility and implementation of sustainability initiatives without compromising guest comfort, thereby strengthening the credibility of green hotel practices.

Keywords: green hotel, guest perception, online customer review, sustainable tourism

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Introduction

Bali, as an international tourism destination, is currently facing serious challenges, particularly concerning tourism sustainability. Issues such as overtourism, plastic waste, environmental degradation, flooding, and various other ecological problems have attracted significant attention from both print and electronic media. In fact, the U.S.-based travel guide Fodor listed Bali among the 15 destinations considered less suitable to visit in 2025 (CNN Indonesia, 2024), alongside major tourist cities such as Barcelona, Venice, and Tokyo. The inclusion of Bali on this list was largely due to overtourism, which has triggered a range of environmental problems. Behind the beauty of Bali's tourist attractions lies a series of pressing issues, particularly the decline in environmental quality that affects the island's social and cultural life (Utama et al., 2024).

To address these challenges, the concept of sustainable tourism continues to evolve and has become the main direction for future tourism development. Sustainable

tourism is a concept or approach to tourism development that aims to enhance economic growth and community well-being through tourism activities without harming local environments and cultures (Saputra, 2024). The principle of sustainable tourism is to generate economic benefits for the present generation without compromising the needs of future generations. Through this concept, tourism is not only oriented toward short-term profits but also ensures that tourism resources can be enjoyed by future generations. The balance between economic growth and environmental preservation is key to the successful implementation of sustainable tourism.

Hotels, as a key component of the tourism industry, play a crucial role in supporting the success of sustainable tourism. Behind their contribution to the economy and the enhancement of tourist experiences, the industry has come under scrutiny for its environmental impacts. According to calculations by the U.S. Environmental Protection Agency, starred hotels generate approximately 33.38 kilograms of CO₂ per room per day. In addition, the average water consumption per guest per night ranges from 170 to 440 liters in five-star hotels. The amount of solid waste produced is also considerable, averaging about 1 kilogram per guest per night (Setiawati & Sitorus, 2014). Given these figures, hotel operations can be considered a significant contributor to environmental degradation, particularly in destinations with a high concentration of accommodation facilities such as Bali.

As a form of environmental responsibility, many hotels in Bali have adopted the eco-friendly concept known as "green hotels". The implementation of this concept includes waste management, reducing single-use plastics, using energy-efficient devices, and various other environmentally friendly practices. The commitment of hotels to environmental sustainability is also reflected in their participation in environmental certification programs such as Green Globe, Earth Check, and Leadership in Energy and Environmental Design (LEED). These efforts are driven not only by increasingly alarming environmental conditions but also by travellers becoming more environmentally conscious. The Sustainable Travel Report 2023, released by Booking.com, revealed that 76% of global travellers plan to take more sustainable trips within the next 12 months. This figure represents an increase of 16% compared to 2021 and 5% compared to 2022.

As travellers' awareness of sustainability continues to rise, their perceptions and experiences of eco-friendly practices implemented by hotels have become increasingly important considerations. Previous studies have shown that eco-friendly practices can shape guests' perceptions in both positive and negative ways (Yi et al., 2018). Several studies have found that respondents generally hold positive perceptions toward eco-friendly practices (Fathima & Nazeem, 2023; Fuchs et al., 2024; Ogbeide, 2012; Yi et al., 2018). However, other studies indicate that some respondents perceive such practices negatively. For example, Han & Chan (2013) found that guests at green hotels tend to perceive higher prices, lower comfort levels, and certain inconveniences. Similarly, Manaktola and Jauhari (2007) reported that customers were reluctant to support eco-friendly practices, as most green initiatives in India were driven by government policies rather than voluntary business efforts. These differing findings highlight the diversity of tourists' perceptions of green hotels.

One relevant way to identify these perceptions is by analysing online customer reviews. Over the past two decades, online customer reviews have become one of the main sources of information for travellers (Pacheco et al., 2024). Through such reviews, both hotel management and travellers can gain insights into guests' assessments of eco-friendly practices, whether they feel satisfied, comfortable, undisturbed, or conversely, inconvenienced by the implemented measures. Although

online customer reviews have been widely used in tourism research to examine guest perceptions of products and services, they have rarely been used specifically to evaluate service providers' eco-friendly practices (Pacheco et al., 2024), particularly in the context of hotels in Bali. To date, few studies have specifically explored how travellers' perceptions of eco-friendly practices in Balinese hotels are reflected in online customer reviews.

Several researchers have examined guests' perceptions of eco-friendly practices using online customer reviews, including (Gil-Soto et al., 2019; Lee et al., 2016; Olorunsola et al., 2024; Pacheco et al., 2024; Yi et al., 2018). All of these studies utilized reviews posted on the TripAdvisor platform. However, one limitation of using TripAdvisor is the difficulty of verifying the authenticity of user experiences, as there is no guarantee that the reviews were written by individuals who stayed at or used the hotel's services. Recognizing this limitation, a more accurate approach is needed by employing a platform that allows only verified guests to submit reviews. One such platform is Booking.com, the world's largest online travel agency (OTA), which plays a significant role in hotel booking distribution and influences travellers' decision-making (Martin-Fuentes et al., 2020). Reviews on Booking.com are verified for authenticity, as only guests who have completed their stay are permitted to post feedback.

Despite the growing body of research on green hotels and the increasing availability of online customer reviews, there remains a limited understanding of how travellers' perceptions of eco-friendly hotel practices in Bali are expressed through verified online reviews. Existing studies have predominantly focused on general perceptions of green hotels or relied on review platforms with limited verification mechanisms. Consequently, empirical evidence capturing travellers' authentic evaluations of eco-friendly practices in Balinese hotels through verified review platforms remains scarce.

To address this gap, understanding travellers' perceptions is essential. Perception can be defined as the process of giving meaning or interpretation to stimuli received by individuals, influenced by both internal and external factors (Fatia & Hananto, 2024). Perception reflects how individuals interpret information from their environment, which may result in positive or negative evaluations and subsequently influence observable behaviour. Perception reflects how individuals interpret information from their environment, which may result in positive or negative evaluations and subsequently influence observable behaviour (Arifin et al., 2017). In the consumer context, perception refers to how individuals respond to and assign meaning to information encountered in daily activities (Simamora, 2008). Accordingly, perception of eco-friendly hotel practices refers to travellers' subjective evaluation of hotels that implement environmentally friendly or sustainability-oriented practices in their operations and management (Fadilahsyah, 2024).

An online customer review is a form of feedback written by consumers on digital platforms after using a product or service, serving as an evaluation of quality and user experience. As a form of electronic word of mouth (eWOM), online customer reviews contain comments, ratings, and recommendations that influence purchasing decisions and provide valuable input for service improvement (Sari & Othman, 2022). These reviews are commonly found on booking platforms such as Booking.com and other digital channels (Graciafernandy & Almayani, 2023).

Based on these considerations, this study aims to address three main research questions: (1) What are the characteristics of travellers staying in green hotels in Bali based on their country of origin and traveller type? (2) How do travellers perceive

green hotels in Bali as reflected in online customer reviews? (3) What are the most frequently mentioned words or phrases in travellers' reviews of green hotels in Bali?

Methodology

This study analyzes guests' perceptions of eco-friendly (green) practices using guest reviews published on the Booking.com platform. The sample of hotels analyzed in this study consists of properties in Bali that have received the Verified Gold certification from Eco Tourism Bali (ETB) through the Eco Climate Badge (ECB) program. This certification indicates that the hotels have met the highest standards of sustainability, including conservation of natural resources, reduction of pollution, biodiversity and ecosystem preservation, and the provision of social benefits to local communities. Eco Tourism Bali has also partnered with Booking.com to promote and support sustainable tourism practices. There are ten hotels in Bali that have received the Verified Gold certification from Eco Tourism Bali, namely: Aksari Luxury Resort & Spa Ubud by Ini Vie Hospitality, Beingsattvaa Luxury Ubud, Potato Head Studios, Bamboo Turtle Ecolodge, Bali Beach Glamping – Luxury Tented Resort, Weddings & Retreat, Kaamala Luxury Resort & Spa Ubud by Ini Vie Hospitality, Nadi Nature Resort, Sarinbuana Eco Lodge, Soulshine Bali, and The Apurva Kempinski Bali.

This study employs a qualitative descriptive approach, using content analysis as the data analysis technique. Content analysis is used to examine the presence of words, phrases, or concepts in the review texts and to identify and interpret their meanings. According to Gunawan & Abadi (2017), content analysis enables researchers to quantify and understand the relationships among concepts within a text. The process begins with collecting textual data, forming initial assumptions, conducting coding, and finally producing interpretations in the form of descriptive findings (Rozali, 2022).

The research began with the collection of online customer reviews via web scraping from the Booking.com platform. The data were collected through a web scraping process conducted in October 2025. All available guest reviews for each selected hotel at the time of data collection were included in the analysis. Only reviews written in English were analyzed to ensure consistency in interpretation and coding. The coding procedure was guided by the ten categories of "green practices" developed by Yi et al. (2018) which include: (1) towel reuse (reuse of towels by guests), (2) linen reuse (reuse of bed sheets or linens), (3) recycling (hotel-led or guest-involved recycling activities), (4) energy (efforts to improve energy efficiency), (5) water (water conservation and efficient use), (6) purchasing (procurement of environmentally friendly or locally produced goods), (7) waste (management and reduction of solid waste), (8) site (physical design, location, and facilities supporting sustainability), (9) education and innovation (environmental education and innovation supporting eco-friendly practices), and (10) general green practice (general sustainability practices not covered in other categories). All guest reviews from each hotel were analyzed using a coding tool to facilitate categorization.

The coding was conducted in two stages. The first stage involved identifying words, phrases, or sentences within guest reviews that contained elements of eco-friendly practices and classifying them into one of the ten predefined categories. The second stage focused on validating the coding results to ensure accuracy, avoid duplication, and maintain consistency across categories. To ensure coding reliability and consistency, the coding process was conducted iteratively, with repeated reviews of the coded data across categories. Peer checking was applied by discussing the

coding framework and selected samples of coded reviews with an academic peer to minimize subjective bias and enhance consistency. Any discrepancies were reviewed and resolved through discussion until agreement was achieved.

Through content analysis of online reviews and coding based on "green practice" categories, this study aims to reveal the characteristics of tourists staying at eco-friendly hotels in Bali by country of origin and traveler type. Furthermore, it seeks to explore tourists' perceptions of environmentally friendly hotels in Bali as reflected in online customer reviews, and to identify the most frequently occurring words and phrases related to eco-friendly practices in these reviews.

Results and discussions

Results

General Description of Research Data

This study explored tourists' perceptions of eco-friendly hotels in Bali using secondary data from online customer reviews on the Booking.com website. Booking.com was selected as it is one of the largest hotel booking platforms that provides authentic reviews from verified guests who have stayed at the accommodations.

The study involved ten eco-friendly hotels in Bali, with a total of 4,495 reviews collected from their Booking.com pages. Among all reviews, 207 reviews (4.6%) contained content or keywords directly related to environmentally friendly topics (green topics). The analyzed topics included towel reuse, linen reuse, recycling, energy, water, purchasing, waste, site, education, innovation, and general green practice. These ten categories represent various dimensions of sustainability implementation in hotels.

Table 1. Number and Percentage of Environmentally Themed Reviews in Eco-Friendly Hotels in Bali

No	Hotel Name	Total Number of Reviews	Number of Environmentally Themed Reviews	Percentage (%)
1	Aksari Luxury Resort & Spa Ubud by Ini Vie Hospitality	633	9	1.4
2	Bali Beach Glamping-Luxury	219	0	0.0
3	Bamboo Turtle Ecolodge	233	19	8.2
4	Beingsattvaa Luxury Ubud	131	21	16.0
5	Kaamala Luxury Resort & Spa Ubud by Ini Vie Hospitality	675	4	0.6
6	Nadi Nature Resort	190	20	10.5
7	Potato Head Studios	958	89	9.3
8	Sarinbuana Eco Lodge	190	30	15.8
9	Soulshine Bali	157	6	3.8
10	The Apurva Kempinski Bali	1109	9	0.8
	Total	4495	207	4.61

Source: Research Findings (2025)

As shown in Table 1, the number of environmentally themed reviews varies across hotels, with several properties receiving substantially more eco-related comments than others.

Characteristics of Tourists Staying at Eco-Friendly Hotels in Bali

This subsection presents the characteristics of tourists staying at eco-friendly hotels in Bali, broken down by country of origin and traveler type.

a. Country of Origin

Tourists staying at eco-friendly hotels in Bali come from various countries, with international visitors predominating. The data show that the largest number of tourists came from Australia (39 people; 18.9%), followed by the United Kingdom (27 people; 13.1%), the Netherlands (17 people; 8.3%), and Singapore (16 people; 7.8%). Other notable countries include France (ten people; 4.9%), Germany (nine people; 4.4%), the United States (8 people; 3.9%), and Switzerland (seven people; 3.4%). In addition, five tourists from Indonesia (2.4%) were present.

Other countries of origin, such as Canada, the United Arab Emirates, Hong Kong, Saudi Arabia, Turkey, Italy, India, and several other European and Asian nations, each accounted for fewer than five tourists (less than 2.5%). Overall, tourists staying at eco-friendly hotels in Bali came from more than 40 countries, indicating that Bali's sustainable hotel concept appeals to a geographically diverse market.

b. Type of Tourist

In terms of traveler type, the majority of guests at eco-friendly hotels in Bali were couples (105; 50.7%). This was followed by family travelers (41 people; 19.8%), solo travelers (39 people; 18.8%), and group travelers (21 people; 10.1%).

Distribution of Tourist Perceptions Toward Eco-Friendly Categories in Eco-Friendly Hotels in Bali

This subsection presents the distribution of tourists' perceptions across ten eco-friendly practice categories identified in the reviews.

Table 2. Distribution of Tourist Perceptions toward Eco-Friendly Categories in Eco-Friendly Hotels in Bali

Review Category	Total Eco-Friendly Reviews	Number of Positive Reviews	Number of Negative Reviews
Towel reuse	9	0	9
Linen reuse	0	0	0
Recycling	11	10	1
Energy	0	0	0
Water	6	2	4
Purchasing	27	24	3
Waste	10	10	0
Site	30	27	3
Education and innovation	3	2	1
General green practice	111	108	3
Total	207	183	24

Source: Research Findings (2025)

Based on the analysis, 207 reviews related to environmental themes were identified. The distribution of positive and negative comments across categories is presented in Table 2. Overall, 183 comments (88.4%) were positive, while 24 comments (11.6%) were negative.

Phrases or Words Most Frequently Appearing in Tourist Reviews of Eco-Friendly Hotels in Bali

1. Phrases or Words Most Frequently Found in Positive Tourist Reviews of Eco-Friendly Hotels in Bali

This subsection presents the most frequently occurring words and phrases in positive tourist reviews of eco-friendly hotels in Bali.



(Source: Research Findings, 2025)

Figure 1. Word Cloud Visualization Showing the Frequency of Words or Phrases in Positive Tourist Reviews of Eco-Friendly Hotels in Bali

The words "sustainable", "environment", and "eco" appear most frequently in the visualization. Other commonly occurring words include "friendly", "green", "nature", "local", "food", and "vegan". Terms related to waste management, such as "recycled", "waste", and "zero", also appear with relatively high frequency.

2. Phrases or Words Most Frequently Found in Negative Tourist Reviews of Eco-Friendly Hotels in Bali

This subsection presents the most frequently occurring words and phrases in negative tourist reviews of eco-friendly hotels in Bali.



(Source: Research Findings, 2025)

Figure 2. Word Cloud Visualization Showing the Frequency of Words or Phrases in Negative Tourist Reviews of Eco-Friendly Hotels in Bali

The most frequently appearing words include "towel", "stain", and "water". These words appear more prominently compared to other terms in the visualization

Discussions

The findings of this study provide an insightful overview of how tourists perceive eco-friendly hotels in Bali, based on reviews on the Booking.com platform. Overall, the results show that of 4,495 reviews, only 207 (4.6%) contained keywords related to eco-friendly or sustainability themes. This indicates that, although these hotels promote an "eco-friendly" positioning, sustainability aspects are not yet a dominant reference point in tourists' post-stay evaluations. This phenomenon aligns with the study by Yi et al. (2018), which found that only a small proportion of online hotel reviews explicitly addressed green practices. Similarly, Boneta-Ruiz et al (2025) reported that sustainability certifications do not automatically translate into sustained attention in online reviews, as guests tend to prioritise core service attributes such as comfort, cleanliness, and service quality.

From the perspective of expectancy–disconfirmation theory, this finding suggests that eco-friendly attributes may function as "implicit" or "background" expectations rather than primary performance criteria. When green practices are perceived as standard or taken for granted, guests may not explicitly mention them unless they exceed expectations or, conversely, lead to dissatisfaction.

Most of the environmentally themed reviews came from international tourists, with the highest proportions originating from Australia (18.9%), the United Kingdom (13.1%), the Netherlands (8.3%), and Singapore (7.8%). Indonesian tourists accounted for only 2.4%. This finding suggests that tourists from developed countries or those with higher environmental awareness are more likely to mention green aspects in their reviews (Dolnicar & Grun, 2009). In terms of traveller type, couples represented the largest segment discussing environmental themes (50.7%), followed by families (19.8%), solo travellers (18.8%), and groups (10.1%). This may indicate that couples, who often travel for leisure and experiential purposes, are more attentive to symbolic and experiential dimensions of sustainability embedded in the hotel environment.

Among the 207 environmentally themed reviews, the majority (88.4%) reflected positive perceptions. Positive comments were predominantly associated with general green practices, site-related aspects, and purchasing practices. These categories represent sustainability elements that are highly visible and directly experienced by guests, such as eco-oriented branding, natural surroundings, architectural integration with nature, and the use of local or plant-based products. This finding is consistent with service quality perspectives, which suggest that tangible cues and experiential attributes play a crucial role in shaping customer perceptions of service performance.

The word cloud analysis of positive reviews reinforces the prominence of experiential and visible dimensions of sustainability in shaping tourists' perceptions of eco-friendly hotels in Bali. Frequently used terms such as "sustainable", "eco", "environment", "friendly", and "nature" suggest that guests tend to associate eco-friendly hotels with a holistic green identity rather than isolated operational practices. This suggests that sustainability is primarily perceived through the overall atmosphere, values, and environmental integration experienced during the stay.

Moreover, a strong appreciation for the site category, including architecture integrated with nature, natural landscaping, and the use of eco-friendly materials, highlights the importance of environmentally conscious design in influencing guest

experiences. This finding is consistent with Chen and Peng (2012), who demonstrated that eco-friendly physical elements, such as natural lighting and surrounding vegetation, foster emotional attachment and positive affective responses toward hotel environments. The prominence of "nature" and related terms in the word cloud further supports the role of physical and spatial design as a key mediator of sustainability perceptions.

In addition, the frequent appearance of words related to "local," "food," and "vegan" reflects tourists' appreciation of sustainability through consumption-related experiences. The purchasing category, encompassing the use of locally sourced products and the provision of vegetarian or vegan menu options, serves as a tangible signal of hotels' sustainability commitment that is easily recognized by guests. These practices align sustainability initiatives with tourists' personal values and lifestyle preferences, thereby enhancing positive evaluations.

Conversely, more technical sustainability practices, such as towel reuse, water efficiency, and energy-saving measures, were less frequently mentioned and, in some cases, elicited negative responses. Notably, all comments on towel reuse were negative, primarily expressing concerns about cleanliness and comfort. This contrast suggests that while experiential and visible sustainability initiatives are positively received, practices perceived as directly affecting core service attributes may undermine guest satisfaction when not aligned with expectations of comfort and hygiene.

These findings highlight important managerial implications. Hotel managers should ensure that environmentally friendly initiatives, particularly those related to resource conservation, are implemented without diminishing perceived service quality. Clear communication explaining towel reuse policies, coupled with assurances of hygiene standards, may help reduce negative perceptions. Moreover, integrating sustainability practices into service delivery in a way that enhances, rather than constrains, guest comfort is critical to preventing green initiatives from being perceived as cost-cutting measures.

Conclusions

Based on the results of this study, several key conclusions can be drawn. First, tourists who expressed environmentally themed perceptions of eco-friendly hotels in Bali were predominantly international visitors, particularly from Australia, the United Kingdom, the Netherlands, and Singapore, with couples being the traveller segment most likely to highlight sustainability-related aspects in their reviews. Second, tourists' perceptions of eco-friendly hotels in Bali were generally positive, with the most appreciated elements including general green practices, environmentally integrated hotel design, and the use of local and sustainable products. Third, the phrase analysis revealed that words such as "sustainable", "eco", "environment", "friendly", and "nature" appeared most frequently, indicating that tourists tend to associate eco-friendly hotels with a holistic green identity rather than isolated technical practices. Overall, the concept and implementation of eco-friendly hotels in Bali have generated positive perceptions among tourists.

From a managerial perspective, hotels are encouraged to strengthen their sustainability communication strategies so that eco-friendly values become more visible and easier for guests to understand. Sustainability initiatives should be implemented consistently while maintaining high standards of comfort and service quality, ensuring that green practices enhance rather than detract from the guest experience.

Despite its contributions, this study has several limitations. First, the analysis relied solely on reviews from a single online platform, Booking.com, which may not fully capture the diversity of tourists' perceptions expressed across other review platforms. Second, the study focused exclusively on eco-friendly hotels in Bali, limiting the generalizability of the findings to other destinations. Third, the use of secondary data restricted the ability to explore tourists' motivations and the deeper interpretations behind their reviews.

Future research could address these limitations by conducting cross-platform comparisons using multiple online review sites to capture a broader range of tourist perspectives. In addition, mixed-method approaches combining content analysis of online reviews with interviews or surveys could provide richer insights into tourists' perceptions and expectations regarding eco-friendly hotel practices. Expanding the geographical scope beyond Bali would also allow for comparative analyses of sustainability perceptions across different tourism destinations.

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Pusaka Saujana of the Soreang Ancient Volcano Site: A Sustainable Cultural Heritage Tourist Destination

Adhika Graha Irianto Putra^{1*}, Ute Lies Siti Khadijah², Priyo Subekti³, Annisa Lazuardina⁴, Muhamad Sofiyurahman⁵

^{1,2,3}Sustainable Tourism Study Program, Universitas Padjadjaran, Bandung, Indonesia

⁴School of Economics of Tourism Sciences (STIEPAR YAPARI), Bandung, Indonesia

⁵Bandung Regency Tourism and Creative Economy Agency, Indonesia

*Corresponding Author: adhika24001@mail.unpad.ac.id

Abstract: Heritage landscapes are increasingly conceptualized as living heritage integrating geological, ecological, cultural, and spiritual dimensions. Despite this recognition, significant gaps remain between conceptual frameworks and their practical implementation, particularly where natural and cultural heritage intersect. This study employs a qualitative case study approach with methodological triangulation in the Soreang Ancient Volcano Area, Bandung Regency, West Java, Indonesia, to examine how *Pusaka Saujana* can inform sustainable cultural heritage tourism development. Data were collected through field observations, in-depth interviews with community stakeholders, and documentation studies, and analyzed using SWOT analysis combined with adaptive management principles. The findings indicate that the area embodies key characteristics of *Pusaka Saujana*, where ancient volcanic formations and ecological practices are closely intertwined with local cultural traditions and spiritual values. However, institutional weaknesses, limited infrastructure, and risks of environmental degradation and cultural commodification constrain sustainable management. To address these challenges, this study proposes a phased adaptive framework comprising recognition and protection of values, integration and reinterpretation, and consolidation and regeneration of heritage. This framework positions *Pusaka Saujana* not merely as a tourism asset but as a paradigm for living heritage governance. Conceptually, the research advances discourse on integrated heritage landscapes, while practically it offers a replicable community-based model for sustainable tourism governance in Indonesia.

Keywords: cultural landscape, geotourism, local culture, *Pusaka Saujana*, sustainable tourism.

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Introduction

The tectonic dynamics occurring within the Pacific Ring of Fire have positioned Indonesia as one of the countries with the most complex geological diversity in the world (Adri et al., 2021; Bhaskara, 2017; Mikhael et al., 2020). Volcanic formations not only produce distinctive natural configurations but also play a central role in shaping social systems, from settlement patterns and economic activities to spiritual values and local cosmologies (Dhamayanti et al., 2023; Pratomo, 2006; Setiawan & Gani, 2020). In this context, the geological heritage of Indonesia functions not merely as an ecological foundation but also as the basis for traditions, knowledge systems, and cultural practices that continue to be transmitted across generations (Cahyono, 2012; Prasojo, 2015; Rahmi et al., 2012). Taken together, these inheritances demonstrate that nature and culture in Indonesia are inseparable dimensions, best understood as a living landscape

shaped through long-term interactions between humans and their environment (Fakhrudin et al., 2023).

Such diversity necessitates a conceptual framework that can integrate natural and cultural dimensions in a balanced manner. The Indonesian Charter for *Pusaka Saujana* Preservation (2019) was established to address this need, defining *Pusaka Saujana* as an Indonesian concept of cultural landscape heritage that results from long-term interactions between humans and their environment, continuously influenced and shaped by local cultural values over time (Piagam Pelestarian Pusaka Saujana Indonesia, 2019; Utami, 2023). This concept complements traditional approaches that often perceive heritage as partial objects by affirming heritage as a living and evolving landscape (Jelen, 2022; Li et al., 2024; Salouw & Ikaputra, 2022). Although the framework provides a strong theoretical basis for interdisciplinary studies, its local level implementation still faces considerable challenges (Utami & Adianti, 2024). Furthermore, the lack of integrative studies linking natural and cultural heritage reveals an important gap in Indonesian heritage scholarship.

The Soreang Ancient Volcano Area, located in the Kutawaringin District of Bandung Regency, provides a relevant case study to address this gap. Formed by volcanic activity approximately four million years ago, the area presents distinctive geomorphological features (Bronto et al., 2006; Ikhrum et al., 2021; Setiawan & Gani, 2020). These geological values render the site significant as a natural laboratory for geotourism and environmental education (Bachtiar, 2023; Jatnika, 2022; Rahman et al., 2024). At the same time, the area is rich in cultural heritage, including *pencak silat* martial arts, *calung* traditional music, and sacred sites still revered by local communities, as documented by the Central Bureau of Statistics of Bandung Regency (BPS Kabupaten Bandung, 2024; Hidayat & Tanudirjo, 2024; Syaifudin et al., 2022). The combination of geological and cultural heritage reinforces the position of the Soreang Ancient Volcano Area as a tangible manifestation of *Pusaka Saujana*.

Nevertheless, despite its significant potential for integrating natural and cultural heritage, previous studies have primarily focused on geological (Bronto et al., 2006; Ikhrum et al., 2021) and tourism-related aspects (Keputusan Bupati Bandung, 2023), without comprehensively connecting them to the social, cultural, and spiritual dimensions embedded in the landscape. This has resulted in fragmented management practices, where cultural values are often treated as supplementary rather than integral elements of *Pusaka Saujana* (Duhari, 2021; Loekito et al., 2024; Pratiwi & Adishakti, 2024; Putra et al., 2025). Consequently, the potential synergy between geological, cultural, and tourism heritage remains underutilized while also generating risks of value erosion and conflicts of interest between conservation and development (Baitulloh et al., 2025; Darmawan, 2022; Rahardjo, 2013).

This phenomenon highlights a gap between the ideal conceptual framework and the actual implementation in the field. Although sustainable tourism is often proposed as a solution (Hall, 2019; Lane, 2018; Ozili, 2024), its implementation frequently proves ineffective due to a disproportionate focus on economic objectives, with insufficient integration of socio-cultural and ecological dimensions. Moreover, strategic data-driven approaches capable of identifying strengths, weaknesses, opportunities, and threats in *Pusaka Saujana* management remain limited (Hidayat & Tanudirjo, 2024; Mashuri, 2011; Rani et al., 2018). Without comprehensive analysis, existing policy formulations risk being ineffective or even detrimental to the very heritage they intend to protect.

Against this background, this study seeks to bridge both conceptual and practical gaps in *Pusaka Saujana* scholarship in Indonesia through an analysis of the Soreang Ancient Volcano Area. The research focuses on three key objectives. First, to identify

and describe the integrated values of natural and cultural heritage in the area. Second, to analyze the strengths, weaknesses, opportunities, and threats that influence its governance and sustainability. Third, to formulate adaptive strategies that integrate *Pusaka Saujana* principles with the framework of sustainable tourism. Through this interdisciplinary approach, the study aims to enrich academic literature in tourism and heritage studies while contributing to the development of holistic participatory and sustainable heritage management models.

Methodology

This research employed a qualitative approach with a single case study design (Creswell, 2013; Stake, 2006). The approach was chosen because it enables an in-depth exploration of contemporary phenomena within real contexts, specifically the cultural landscape of *Pusaka Saujana* in the Soreang Ancient Volcano Area. The single case study is also relevant for uncovering the complex interrelations between natural heritage (geology and ecology) and cultural heritage (traditions, spirituality, and local knowledge) that together shape the identity of the area (Lucas et al., 2018; Shrestha & Bhattarai, 2022).

The research was conducted from March to July 2025 in the Soreang Ancient Volcano Area, Sukamulya Village, Kutawaringin District, Bandung Regency, West Java. The location was selected because it represents a heritage landscape that integrates geological values of ancient volcanic remains, distinctive ecology, local cultural traditions, and community spirituality centered on sacred sites. The unit of analysis was the heritage landscape of *Pusaka Saujana* as a whole, encompassing the interconnectedness of natural and cultural dimensions. The research focused on three aspects. First, classification of natural and cultural heritage values. Second, identifying opportunities, challenges, and risks in management. Third, formulation of adaptive strategies aligned with the principles of sustainable tourism.



(Source: Ikhrum et al., 2021)

Figure 1. Location of the Soreang Ancient Volcano Area

Data collection was carried out through three main techniques, namely limited participatory observation, in-depth interviews, and document study. Observation was conducted through repeated site visits to record physical conditions such as geological formations (Mount Singa, Mount Aul, Mount Kaseproke, and Mount Kutawaringin) as well as community activities related to local traditions and sacred sites, and was documented using field notes and photographs. Semi-structured interviews were conducted face-to-face using purposive sampling with the village head, hamlet head, village tourism

manager, and three visitors (Table 1). Each interview lasted approximately 30–60 minutes and focused on heritage values, management challenges, tourism potential, and community expectations. The village head, hamlet head, and village tourism manager were designated as key informants due to their institutional roles and in-depth knowledge of heritage governance, while visitors served as supporting informants to provide experiential perspectives and support data triangulation (Lisani, 2024; Putra et al., 2025). Document study was employed to complement primary data with academic literature, local historical archives, regional government policies, official reports, and mass media. The combination of these three techniques enabled methodological triangulation, which strengthened the validity of findings and provided a solid empirical basis for research analysis (Lazuardina et al., 2025).

Table 1. Classification of Research Informants

No	Informant Category	Informant Type
1.	Village Head	Key Informant
2.	Hamlet Head	Key Informant
3.	Village Tourism Manager	Key Informant
4.	Visitor 1	Supporting Informant
5.	Visitor 2	Supporting Informant
6.	Visitor 3	Supporting Informant

Source: Primary data processed by the author (2025)

Data analysis followed the interactive model of Miles, Huberman, and Saldana, which includes three stages. First, data condensation. Second, data display. Third, drawing conclusions (Balahmar, 2025; Hashimov, 2015). Data credibility was ensured through triangulation of sources and methods, by comparing interview results from various stakeholders, verifying them with direct observation, and cross-checking with documentary data. This step reinforced the consistency, credibility, and trustworthiness of the study while ensuring that interpretations were firmly rooted in empirically accountable evidence.

Results and discussions

Classification of Natural and Cultural Heritage Values

The results of field observations combined with in-depth interviews revealed that the Soreang Ancient Volcano Area can be categorized as a *Pusaka Saujana* site, characterized by the integration of natural, ecological, and cultural dimensions. From a geological perspective, ancient volcanic activity that occurred approximately four million years ago formed a series of distinctive features, including Mount Singa, Mount Aul, Mount Kaseproke, and Mount Kutawaringin (Figure 2). These four formations are not only geomorphological structures that represent long-term natural processes but also serve as symbols of local identity internalized by the community. This was emphasized by the Head of Sukamulya Village, who stated: *“The main potential in our village lies in Mount Singa, Mount Aul, Mount Kaseproke, and Mount Kutawaringin. Those are what outsiders know, and they are our pride,”* stated the Village Head.



(Source: Researcher Documentation, 2025)

Figure 2. Landscape of the Soreang Ancient Volcano Area

Beyond geological values, the area also holds ecological significance manifested in traditional farming practices, natural honey bee cultivation, and local food processing such as *peuyeum*. These elements not only sustain household economies but also strengthen the community's attachment to its environment. The Sukamulya Village Tourism Manager highlighted the relevance of these aspects for tourism: *"In addition to the mountains, we also have potential in farming, honey bee cultivation, and traditional culinary products such as peuyeum. If managed well, these can become additional attractions,"* stated Village Tourism Manager.



(Source: Researcher and Community Documentation, 2025)

Figure 3. Cultural and Spiritual Heritage Assets: (a) *Pencak Silat* Martial Arts, (b) *Calung* Traditional Music, (c) Sacred Site at Mount Kutawaringin, and (d) Sacred Site at Mount Singa

Alongside natural and ecological aspects, cultural heritage in the area remains preserved through the continuity of *pencak silat* martial arts, *calung* music, and reverence for sacred sites at the peak of Mount Kutawaringin, which is considered a sacred space by the local community (Figure 3). A community leader explained: *"People*

here still practice Sundanese arts such as *pencak silat* and *calung*. In addition, there is a sacred site at the top of Mount Kutawaringin that is still guarded and respected by the community” stated Hamlet Head.

These practices demonstrate that the landscape extends beyond material values, preserving spiritual and symbolic dimensions transmitted across generations. Thus, the classification of heritage values in the Soreang Ancient Volcano Area affirms the close interconnection between geology, ecology, and culture. The area is not merely a physical space with unique natural configurations but also a social and cultural arena that constitutes the basis of collective identity for the local community.

Identification of Opportunities, Challenges, and Risks in Management

To understand the dynamics of area management, the results of interviews and field observations were analyzed using the SWOT framework (Strengths, Weaknesses, Opportunities, Threats). This analysis enabled a more systematic mapping of the strengths, weaknesses, opportunities, and threats faced by the Soreang Ancient Volcano Area as a *Pusaka Saujana*-based destination. A summary of the analysis is presented in Table 2 below.

Table 2. SWOT Analysis of the Soreang Ancient Volcano Area

No	Aspect	Description
1	Strengths	<ol style="list-style-type: none"> 1. Unique geological landscape, including Mount Singa, Mount Aul, Mount Kaseproke, and Mount Kutawaringin, is the basis for geotourism. 2. Living cultural and spiritual traditions (<i>pencak silat</i>, <i>calung</i>, and sacred sites at the peak of Mount Kutawaringin). 3. Support from the village government for tourism development.
2	Weaknesses	<ol style="list-style-type: none"> 1. Absence of formal institutions such as community tourism groups (<i>pokdarwis</i>). 2. Limited human resource capacity in tourism management and digital promotion. 3. Inadequate basic infrastructure, including roads, signage, and sanitation facilities.
3	Opportunities	<ol style="list-style-type: none"> 1. Growing trends in eco adventure and cultural tourism. 2. Government village tourism programs. 3. Potential integration of local small enterprises, such as honey, <i>peuyeum</i>, and handicrafts, with tourism.
4	Threats	<ol style="list-style-type: none"> 1. Risk of waste generation and environmental degradation due to increased visitation. 2. Commodification of culture that may reduce its original meaning. 3. Limited structural support from the regional government.

Source: Field observations and interviews (2025)

The SWOT analysis in Table 2 shows that the main strengths of the area lie in its unique geological features, namely Mount Singa, Mount Aul, Mount Kaseproke, and Mount Kutawaringin, as well as the continuity of cultural traditions such as *pencak silat*, *calung* music, and sacred sites at the top of Mount Kutawaringin. Social capital in the form of support from the village government further reinforces the position of the area as a *Pusaka Saujana* with distinctive attractiveness. These factors provide a strong foundation for developing nature and culture-based tourism.

Despite its significant potential, the area still faces structural weaknesses that hinder optimal management. Limitations in basic infrastructure, such as road access,

sanitation facilities, a lack of signage, and minimal interpretive media, restrict visitor comfort. This was reinforced by the statement of the village tourism manager, who emphasized poor road conditions and low intensity of digital promotion. Another obstacle is the limited human resource capacity in tourism management and online marketing, exacerbated by the absence of formal institutions such as community tourism groups (*pokdarwis*). These conditions indicate that the primary challenges are not the lack of potential but rather limitations in institutional frameworks and service quality.

On the other hand, the area possesses strategic opportunities due to the rising trend of nature and culture-based tourism, government support through village tourism programs, and potential integration with local small enterprises such as honey, *peuyeum*, and handicrafts. However, these opportunities are overshadowed by serious threats, including environmental degradation, cultural commodification, and weak regional government support for physical infrastructure. One visitor even noted that the absence of information and educational facilities directly reduced the quality of their tourism experience. Therefore, the development opportunities of the area can only be realized if internal weaknesses are addressed and external threats are mitigated through participatory, adaptive, and collaborative governance.



(Source: Researcher Documentation, 2025)

Figure 4. Tourism Potential in the Soreang Ancient Volcano Area

Adaptive Strategies for the Development of Sustainable Tourism

Referring to the results of the SWOT analysis, the development of the Soreang Ancient Volcano Area requires adaptive strategies that emphasize the integration of geological, ecological, cultural, and spiritual dimensions as the distinctive features of *Pusaka Saujana*. This approach not only optimizes the potential of existing assets but also mitigates structural weaknesses and reduces the risks of cultural commodification and environmental degradation. The principle of adaptive management is crucial, as it enables flexibility and continuous learning in responding to local dynamics (Hunter, 1997; Nicolini et al., 2025; Williams, 2011).

Table 3. Adaptive Strategies for the Development of Sustainable Tourism in the Soreang Ancient Volcano Area

No	Strategy	Focus of Strategy
1	S-O	Integrating geotourism, ecotourism, and cultural tourism based on <i>Pusaka Saujana</i> ; utilizing the uniqueness of volcanic landscapes as

		destination identity; providing community capacity building in tourism management; and developing local small enterprises such as honey, <i>peuyeum</i> , and handicrafts as part of the heritage value chain.
2	W-O	Establishing formal institutions such as community tourism groups (pokdarwis) to safeguard authenticity of heritage; providing intensive training for local tourism actors to enhance competence; developing digital promotion systems with saujana narratives; and improving environmentally friendly tourism infrastructure through cross-sector partnerships.
3	S-T	Leveraging the geomorphological advantages of the area to strengthen destination differentiation while supporting ecological risk mitigation strategies; developing tourism branding narratives based on heritage conservation that integrates nature, culture, and spirituality; and formulating local regulations grounded in cultural values and community consensus to prevent excessive commodification.
4	W-T	Preparing conservation guidelines and safety protocols through community participation; prioritizing the construction and improvement of basic environmentally friendly infrastructure such as trekking routes, signage, and sanitation facilities as prerequisites for sustainability; and developing heritage interpretation based on geotourism to maintain authenticity while differentiating visitor experiences from other destinations.

(Source: Field analysis, 2025)

The strategies formulated from the SWOT analysis demonstrate that development of the area requires an integrative and multidimensional approach. The findings show that success is not only determined by the utilization of geological and cultural advantages but also by the existence of local institutions capable of coordinating actors, the capacity of communities in destination management, and regulatory mechanisms that prevent ecological degradation and cultural commodification. Thus, the adaptive strategies developed cannot stand alone but must serve as an operational framework that links heritage assets with the needs of sustainable governance. These findings affirm the empirical basis for formulating gradual implementation processes that align with the principles of sustainable tourism and heritage landscape governance rooted in *Pusaka Saujana*.

Discussions

The findings demonstrate that the Soreang Ancient Volcano Area can be positioned as *Pusaka Saujana* because it encompasses both natural and cultural dimensions within a single landscape. Ancient volcanic formations such as Mount Singa, Mount Aul, Mount Kaseproke, and Mount Kutawaringin are not only valuable as geotourism assets but also serve as symbols of local identity that have been internalized by the community. The continuity of *pencak silat* martial arts, *calung* music, and the sacred site at the peak of Mount Kutawaringin further affirms that the area is not merely a physical space but also a social and spiritual arena that remains active. These findings are consistent with the Indonesian Charter for the Preservation of *Pusaka Saujana* (2019), which emphasizes the interaction between humans and their environment through the integration of geology, ecology, culture, and spirituality (Rani et al., 2018; Utami, 2023). This perspective reinforces the view of heritage as living heritage that is continuously reproduced through social practices (Dragan et al., 2024; Lin, 2024; Osman & Farahat, 2021).

However, when compared with the framework of cultural landscapes (Rahmi et al., 2012; Salouw & Ikaputra, 2022; Taylor & Lennon, 2011; Zhang & Marzbali, 2024), management practices in the field still tend to position culture as an additional element, exposing a gap between theoretical concepts and practical implementation. Field analysis also reveals both significant opportunities and real risks for the development of the area. In terms of opportunities, the Soreang Ancient Volcano Area aligns with global trends in nature-based tourism and cultural tourism (Donici & Dumitras, 2024; Kim et al., 2015; Satria et al., 2021; Setya et al., 2019). The expressed willingness of local communities to participate in village tourism initiatives indicates potential for the application of Community-Based Tourism, which emphasizes community self-reliance (Giampiccoli & Saayman, 2018; Lamoren et al., 2025; Nair & Hamzah, 2015; Setyaputri et al., 2025).

A comparable case can be found in the Nglanggeran Ancient Volcano in Yogyakarta, which similarly developed a former volcanic landscape into a community-based tourism destination integrating geological heritage, local culture, and village enterprises (Brilliana & Mustofa, 2024; Pramono & Juliana, 2025; Suyatna et al., 2024). Unlike Soreang, Nglanggeran has benefited from stronger institutional consolidation, clearer interpretation systems, and national recognition that enhance its management stability and branding capacity. In comparison, the Soreang Ancient Volcano Area demonstrates comparable geological uniqueness and living cultural practices, yet remains in an earlier stage of institutional development. This contrast highlights that while Soreang possesses similar foundational assets, its sustainable advancement depends on strengthening local governance structures and implementing phased adaptive strategies grounded in *Pusaka Saujana* principles.

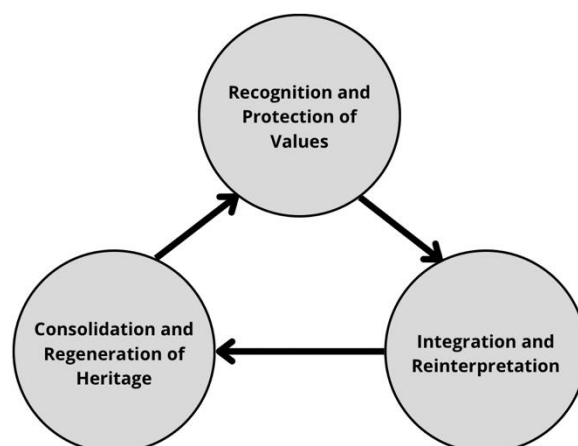
Despite these opportunities, structural weaknesses remain significant barriers. The absence of basic infrastructure, limited human resource capacity, weak digital promotion, and the lack of formal institutions such as community tourism groups (pokdarwis) constitute the main challenges. Ecological risks, including trail degradation and waste pollution, highlight the urgency of calculating carrying capacity (Fernández-Villarán et al., 2020). Furthermore, threats of cultural commodification and staged authenticity may erode spiritual meanings and the authenticity of local arts if performances are oriented solely toward tourist satisfaction (Ibrahim et al., 2024; Urry, 2002; Urry & Larsen, 2011). Thus, the potential of the area remains latent and will only transform into real strength if these weaknesses and threats can be systematically mitigated.

At a strategic level, the findings underscore the importance of strengthening local institutions, particularly through the establishment of community tourism groups (pokdarwis), as coordination platforms and guardians of authenticity (Astiana & Sukriadi, 2024; Lazuardina et al., 2025; Raharjo & Wirahayu, 2025). Capacity building for human resources in destination management and digital marketing is also a prerequisite for enabling the area to compete within the modern tourism ecosystem. Improvement of environmentally friendly basic infrastructure, such as road access, trekking routes, educational signage, and sanitation facilities, must be prioritized. In the long term, governance based on the pentahelix model will be highly relevant, as it unites government, community, academia, businesses, and media in a participatory collaboration framework (Auliyani & Haris, 2024; Baitulloh et al., 2025; Iman & Alam, 2024).

The existing strategic framework is then translated into phased strategies that encapsulate the research recommendations. This approach functions as an operational blueprint that concretely bridges the gap between the theoretical concept of *Pusaka Saujana* and the realities of field management. The research formulates strategies into three conceptual phases rooted in *Pusaka Saujana*. These phases are not understood as

sequential physical development but as a transformative process of cultural landscapes that unites natural, ecological, social, and spiritual heritage.

1. **Phase of Recognition and Protection of Values**
The initial stage focuses on recognition of the area as *Pusaka Saujana*. Key actions include the inventory of ancient geological formations, documentation of cultural traditions, and formulation of conservation guidelines based on local wisdom. The objective is to foster collective awareness that the area is not merely a tourism asset but a heritage of community identity.
2. **Phase of Integration and Reinterpretation**
Following recognition, the next stage emphasizes the integration of heritage into meaningful tourism experiences. Priorities include developing interpretive trails, educational media grounded in geotourism, and revitalization of rituals and local arts without losing authenticity. In this phase, the landscape is positioned as living heritage actively reproduced through social practices.
3. **Phase of Consolidation and Regeneration of Heritage**
The final stage focuses on diversifying tourism products that support the local economy while reinforcing intergenerational transmission of heritage values. Geotourism, agritourism, ecotourism, and cultural tourism can be developed within integrated thematic narratives, supported by village enterprises and community-based environmental regulations. Branding the area as a sustainable *Pusaka Saujana* destination becomes a key strategy to ensure the balance between preservation, cultural identity, and community well-being.



(Source: Researcher Analysis, 2025)

Figure 5. Adaptive Cyclical Framework for *Pusaka Saujana*-Based Heritage Management

Through this three-phase framework, the adaptive strategies adopted demonstrate that development of the Soreang Ancient Volcano Area cannot be reduced to destination building alone (Hunter, 1997; Nicolini et al., 2025; Williams, 2011). It must also be understood as a cycle of heritage transmission encompassing recognition, integration, and regeneration of values. This approach offers conceptual novelty by positioning *Pusaka Saujana* not merely as an additional element in tourism but as the foundational paradigm guiding the entire process of sustainable planning. Unlike linear models of short, medium, and long-term physical development, the phased strategies proposed emphasize cyclical transmission of values. Thus, *Pusaka Saujana* is positioned at the core

of development, where recognition, integration, and regeneration ensure continuity of cultural identity, ecological sustainability, and community well-being. Heritage is not confined to tourist objects but is understood as living heritage that must be reinforced through social practices and adaptive governance.

Despite offering a comprehensive conceptual framework, this research has limitations that must be acknowledged. Data collected through interviews with the village head, hamlet head, village tourism manager, and three visitors do not fully represent the perspectives of regional government or private sector actors who play important roles in policy and investment. Field observations were also conducted within a limited time period, leaving seasonal dynamics such as traditional rituals or visitor fluctuations only partially captured. Moreover, the research relied primarily on qualitative approaches without incorporating quantitative measures such as ecological carrying capacity analysis or economic valuation of ecosystem services. These limitations open avenues for future research, including longitudinal studies to examine cultural transformations and ecological pressures, as well as mixed-method approaches that integrate quantitative analysis to strengthen the empirical basis of policy formulation. Through such steps, the development of the Soreang Ancient Volcano Area can be directed toward becoming a best practice model for *Pusaka Saujana* management aligned with the principles of sustainable tourism.

Conclusions

This research confirms that the Soreang Ancient Volcano Area can be categorized as a *Pusaka Saujana* site, as it integrates geological, ecological, cultural, and spiritual values within a single landscape that holds profound ecological and cultural significance. Ancient geological formations, such as Mount Singa, Mount Aul, Mount Kaseproke, and Mount Kutawaringin, combined with the preservation of pencak silat martial arts, calung music, local farming practices, and the sacred site at the peak of Mount Kutawaringin, position the area as more than just a tourist attraction. It functions as a representation of local identity and a socio-economic space for the community. Field analysis reveals that the area's potential remains constrained by institutional weaknesses, inadequate basic infrastructure, limited human resource capacity, as well as risks of ecological degradation, cultural commodification, and weak governance. Nevertheless, development opportunities persist through the growing trends of nature-based and culture-based tourism, supported by village tourism programs, provided that internal challenges and external threats are systematically addressed.

In this context, the study recommends phased implementation strategies rooted in the concept of *Pusaka Saujana*. These strategies emphasize the cycle of value transmission through three phases, namely recognition and protection of values, integration and reinterpretation, and consolidation and regeneration of heritage, with *Pusaka Saujana* placed at the core of destination development. The approach applies principles of adaptive management to ensure governance that is flexible, responsive, and oriented toward continuous learning. At a broader level, management of the area requires a collaborative pentahelix model that involves government, community, academia, business actors, and media. The practical implication of this framework for green tourism lies in promoting environmentally friendly infrastructure, community-based waste management, low-impact tourism activities such as geotourism, agritourism, and cultural tourism, as well as heritage interpretation grounded in local wisdom to maintain ecological balance and cultural authenticity.

By adopting this strategy, the Soreang Ancient Volcano Area can serve as a prototype for *Pusaka Saujana* management based on sustainable and green tourism

principles. Its practices have the potential to be replicated at both regional and national scales while safeguarding ecological balance and cultural preservation. Future research is therefore encouraged to incorporate longitudinal and mixed-method approaches to examine long-term socio-cultural transformation, ecological carrying capacity, and economic impacts of heritage-based tourism, thereby strengthening evidence-based policy formulation and advancing *Pusaka Sajana* as a living heritage model within green tourism discourse.

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Green Performance Management Practices in Enhancing Employee Green Behaviour at Mercure Bali Legian

I Nengah Sudiarta^{1*}, Ni Gst Nym Suci Murni², Ni Made Ernawati³

^{1,2,3}Tourism Department, Politeknik Negeri Bali, Indonesia

*Corresponding Author: nengahsudiarta.ins@gmail.com

Abstract: This study examines the influence of Green Performance Management (GPM) on Employee Green Behaviour (EGB) and develops a model of GPM practices that enhance environmental performance at Mercure Bali Legian. A mixed-method approach was employed, combining quantitative and qualitative techniques. Quantitative data were obtained through a survey of 85 employees, selected using purposive sampling, and analysed with Pearson correlation and simple linear regression using SPSS version 26. The results revealed a significant positive relationship between GPM and EGB, with a correlation coefficient of $r = 0.344$ and a determination coefficient (R^2) of 0.119, indicating that 11.9% of the variation in EGB can be attributed to GPM practices. Qualitative findings, supported by interview excerpts and FGD validation, revealed that green initiatives remain concentrated at the managerial level with limited individual accountability. Qualitative data were collected through interviews with department heads and staff, observations, and validated through a Focus Group Discussion (FGD) with the management team. Findings highlighted that while GPM practices such as environmental goal setting, green KPIs, waste management, and sustainable procurement were implemented, employee behavioural consistency remained limited due to weak accountability and inconsistent training. The study concludes that GPM exerts a positive yet relatively modest effect on EGB. To strengthen outcomes, it is recommended that the hotel improve integration of GPM practices through structured dissemination, routine training, individualized performance monitoring, and formal feedback mechanisms. These enhancements are expected to increase employee engagement in sustainability initiatives and align behaviour more effectively with environmental performance.

Keywords: employee, green behaviour, green human resources management, green performance management

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Introduction

Global warming has emerged as one of the most pressing global challenges, primarily driven by rising greenhouse gas emissions from human activities (Utina, 2012). As a result, governments worldwide have developed policies to mitigate climate change and environmental degradation. Within this context, environmental sustainability practices have become increasingly important across all economic sectors, particularly tourism, which exerts a significant environmental impact. The hospitality industry, as a major part of tourism, is closely tied to the surrounding environment, making sustainability a critical factor for long-term operations (Sari, 2015).

To address these challenges, Human Resources Departments within the hospitality sector have embraced Green Human Resources Management (GHRM) to foster practices beneficial to both the environment and employees. GHRM integrates sustainability into recruitment, training, performance management, and rewards (Opatha & Arulrajah,

2014; Zurnali & Sujanto, 2020), aiming to instill a green culture and behaviour at both individual and organizational levels (Devi, 2018). Despite its potential, GHRM has not been fully adopted across industries (Zibarras & Coan, 2015). Among its core elements, Green Performance Management (GPM) plays a vital role by setting environmental objectives and evaluating progress through appropriate strategies (Mondy & Martocchio, 2016; Mehta & Chugan, 2015).

Green HRM and GPM support environmental performance by ensuring employees possess the skills and motivation required to contribute effectively. Practices such as green recruitment, continuous environmental training, and reward systems can enhance employee commitment (Isrososiawan et al., 2020; Dutta, 2012). Rewards and compensation also serve as important motivators for pro-environmental behaviour (Syafari, 2022), though their influence may vary depending on employee tenure and organizational context (Ardiza et al., 2021; Mandago, 2018).

Previous studies on Green HRM show mixed results across contexts. Pham et al. (2019) found that while green training and employee involvement improved corporate environmental performance, the effect of performance management required mediation through pro-environmental citizenship behaviour. Jeronimo et al. (2019) highlighted demographic influences, noting stronger sustainability perceptions among men and the need for more training among younger employees. In other sectors, Escrig-Olmedo (2015) emphasized reliable corporate environmental performance measurement for external assurance, while Astuti and Wahyuni (2018) found training and development to be the most critical element for MSMEs, with performance management and rewards less emphasized. Collectively, these findings indicate that both structural HR practices and behavioural pathways, shaped by contextual factors, are essential in driving sustainable performance.

According to Pham et al (2019), the hospitality industry is one of the sectors with significant environmental impacts, particularly in terms of energy consumption, water usage, and waste generation. Hotels contribute substantially to carbon emissions and environmental degradation if sustainability practices are not systematically managed. Mercure Bali Legian, a four-star hotel under the Accor group with 321 rooms, exemplifies GPM practices by integrating sustainability initiatives into daily operations. These include guest programs promoting towel and linen reuse, eco-friendly amenities, and elimination of single-use plastics. Employee-focused initiatives involve waste reduction, energy conservation, CSR activities, and partnerships for recycling and composting. Since opening in 2014, the hotel has earned recognition through certifications such as Green Key International and the Tri Hita Karana Award, highlighting its achievements in environmental sustainability. Nevertheless, previous research indicates that GPM accounts for only 40.45% of the impact on environmental performance, leaving other factors unaddressed.

Despite the hotel's extensive sustainability initiatives, employee green behaviour (EGB) remains inconsistent. Limited awareness and engagement, stemming from a lack of understanding of GPM practices, may hinder the full realization of the hotel's sustainability potential. Therefore, this study aims to analyse and evaluate the influence of GPM practices on EGB and to design a GPM model that enhances environmental performance at Mercure Bali Legian. Specifically, the objectives are to analyse the impact of GPM practices on employee environmentally friendly behaviour, and to develop a GPM practice model that strengthens employee contributions to improving environmental performance at the hotel. Based on these objectives, this study formulates the following research questions: (1) How do Green Performance Management practices influence Employee Green Behaviour in improving environmental performance at Mercure Bali

Legian? (2) What is the Green Performance Management practice model that influences Employee Green Behaviour in improving environmental performance at Mercure Bali Legian?

The urgency of this research arises from the increasing environmental pressure on the tourism sector, stricter sustainability certification requirements, and the limited empirical evidence on how Green Performance Management directly influences Employee Green Behaviour in internationally branded hotels. Without empirical validation at the organizational level, sustainability initiatives risk remaining symbolic rather than effectively embedded in employee performance systems.

Methodology

This research employed a mixed-method approach with an embedded case study design (Creswell, 2012), prioritizing qualitative exploration while integrating quantitative analysis for validation. Data were collected through observation, semi-structured interviews, Focus Group Discussion (FGD), literature review, and a questionnaire distributed to employees of Mercure Bali Legian. The study applied a purposive sampling technique (Sugiyono, 2015), selecting participants based on their relevance to sustainability practices and operational involvement. A total of 85 employees participated in quantitative surveys, representing various departments including Front Office, Housekeeping, Food & Beverage, Engineering, Sales & Marketing, and Talent & Culture. Respondents were recruited voluntarily with management approval, ensuring representation across functional areas and employee levels. The questionnaire was designed on a Likert scale (1-4) and distributed via Google forms. It measures two primary constructs: Green Performance Management (GPM) and Employee Green Behaviour (EGB). *GPM indicators* included environmental goal setting, green performance appraisal, monitoring of environmental KPIs, and feedback mechanisms. *EGB indicators* assessed employees' environmentally responsible actions such as energy conservation, waste reduction, water-saving behaviour, participation in environmental initiatives, and voluntary pro-environmental engagement.

Qualitative data were obtained through semi-structured interviews with key informants, including General Manager, Executive Housekeeper, Human Resources Manager, and selected department heads. Interview questions focused on implementation of sustainability policies, integration of environmental objectives into performance systems, employee engagement challenges, and perceived effectiveness of Green Performance Management Policies. In addition, non-participant observations were conducted in operational areas such as guest rooms, housekeeping processes, waste management stations, energy-use practices, and hotel environmental communication materials. Observations aimed to document actual sustainability practices, employee behaviour, and alignment between policy and implementation. A Focus Group Discussion (FGD) was held with the management team to validate quantitative findings and refine the proposed Green Performance Management model. The FGD explored interpretations of statistical results, organizational barriers, behavioural drivers, and practical strategies to strengthen Employee Green Behaviour.

Qualitative data were analysed using Miles et al. (2014) framework, involving data collection, reduction, display, and conclusion drawing, whereas quantitative data were processed using SPSS version 26, including validity and reliability tests, classical assumption testing, Pearson correlation, simple linear regression analysis, determination coefficient (R^2), and hypothesis testing. To ensure methodological rigor, triangulation was applied by integrating multiple data sources and methods. This comprehensive

strategy provides a robust foundation to analyse how Green Performance Management Influences Employee Green Behaviour at Mercure Bali Legian.

Results and discussions

Results

Quantitative Stage

This study examined the effect of Green Performance Management (GPM) practices on Employee Green Behaviour (EGB) at Mercure Bali Legian, involving 85 respondents out of 162 employees.

Table 1. Respondent Profile at Mercure Bali Legian

Category	Sub-Category	Number of Respondents	Percentage (%)
Employee Status	Permanent	6	7.06
	Contracted	79	92.94
Length of Service	< 2 years	16	18.82
	2 – 3 years	31	36.47
	4 – 5 years	4	4.71
	6 – 7 years	5	5.88
	> 8 years	29	34.12
Educational Background	High School/ Vocational High School	25	29.41
	Diploma I/II/III	43	50.59
	DiplomaIV/Bachelor	17	20.00
Total Respondents		85	100

Source: Human resources Department, Mercure Bali Legian 2025

The sample, drawn purposively, consisted exclusively of permanent and contracted staff (6 permanent and 79 contracted), as they hold more stable and long-term responsibilities relevant to GAPM and environmental performance. Respondent characteristics indicate a balanced distribution across tenure and educational background. In terms of service length, the largest group had worked for 2–3 years (36.47%), followed by those with over 8 years of experience (34.12%), reflecting both mid-level and long-tenured employees who have been significantly exposed to the hotel's environmental initiatives. Meanwhile, newer employees (<2 years, 18.82%) provided perspectives on the more recent implementation of green practices.

Regarding education, most respondents (50.59%) held Diploma I/II/III qualifications, with 29.41% completing high school (SMA/SMK) and 20% holding a bachelor's degree. This diverse profile ensures varied insights into how employees with different levels of academic preparation and professional experience perceive and engage in green practices, thereby strengthening the representativeness of the findings on the relationship between GPM and EGB at Mercure Bali Legian.

The correlation test is a statistical technique used to assess the degree of association or closeness between two variables, as indicated by the correlation coefficient (r), which is calculated using the Pearson correlation method. The relationship between the variables Green Performance Management and Employee Green Behaviour can indicate either a positive or negative direction.

Table 2. Correlation Test

		GPM	EGB
GPM	Pearson Correlation	1	.344**
	Sig. (2-tailed)		.001
	N	85	85
EGB	Pearson Correlation	.344**	1
	Sig. (2-tailed)	.001	
	N	85	85

**.

Source: SPSS (data processed), 2025

Based on the correlation test, Green Performance Management and Employee Green Behaviour show a moderate positive relationship ($r = 0.344$, $p = 0.001$). The correlation is statistically significant at the 0.01 level, indicating that GPM practices significantly enhance EGB at Mercure Bali Legian.

In this study, a simple linear regression analysis is employed to examine the influence of the independent variable on the dependent variable. The decision-making process in simple linear regression is guided by a comparison between the significance value (p-value) and a standard probability threshold of 0.05.

Table 3. Simple Linear Regression Analysis

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	13.640	2.159		6.317	.000
	GPM	.292	.087	.344	3.342	.001

a. Dependent Variable: EGB

Source: SPSS (data processed), 2025

The regression analysis shows that Green Performance Management (GPM) positively influences Employee Green Behaviour (EGB), with the equation $EGB = 13.640 + 0.292(GPM)$. The significance value ($p = 0.001 < 0.05$) confirms the effect is statistically significant, while the standardized beta (0.344) indicates a moderate positive impact. Thus, GPM practices play an important role in fostering environmentally responsible behaviour among employees at Mercure Bali Legian.

The t-test results show that GPM significantly influences EGB, with t-count (3.342) exceeding t-table (1.990) and p-value (0.001) below 0.05. Thus, the null hypothesis is rejected, confirming that GPM practices meaningfully enhance employee green behaviour at Mercure Bali Legian.

Table 4. Determination Coefficient Test

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.344 ^a	.119	.108	1.91224
a. Predictors: (Constant), GPM				
b. Dependent Variable: EGB				

Source: SPSS (data processed), 2025

The coefficient of determination shows an R^2 of 0.119, meaning Green Performance Management explains 11.9% of the variance in Employee Green Behaviour. Although the effect is moderate, it is statistically meaningful, indicating GPM contributes to EGB, while 88.1% of the variance is influenced by other factors beyond this study. These findings address Research Question 1 by demonstrating the extent to which Green Performance Management practices significantly influence Employee Green Behaviour at Mercure Bali Legian.

Qualitative Stage

The qualitative phase, through interviews, observations, and focus group discussions, provided deeper insights into how Green Performance Management (GPM) practices are implemented and perceived at Mercure Bali Legian.

Results of Interview and Observation on Green Performance Management Practices

Interviews with department heads revealed and emphasized that sustainability KPIs are aligned with Accor's targets and monitored through the GAIA 2.0 platform. One department head stated: "Environmental targets such as energy saving and waste reduction are already integrated into departmental objectives, but consistent monitoring at the individual employee level remains a challenge." Similarly, the Human Resources Manager emphasized that green performance evaluation is conducted primarily at the managerial level: "Green performance indicators are included in management reviews; however, operational staff appraisal still focuses more on service, discipline, and productivity metrics." Interviews also highlighted generally positive employee attitudes toward sustainability initiatives: "Most employees are supportive of green practices, especially waste segregation and towel reuse programs. The difficulty is maintaining consistency during busy operational periods." Observational findings supported these statements. Field observations documented visible sustainability practices including LED lighting, motion sensors, waste segregation stations, and environmental communication materials in guest rooms. However, inconsistencies were observed in daily behaviour: "During peak hours, waste segregation procedures were occasionally bypassed, and energy-saving practices (e.g., switching off unused lights) were not consistently followed." These findings indicate that while green policies and infrastructure are present, behavioural reinforcement mechanisms require strengthening.

Result of Focus Group Discussion

The Focus Group Discussion (FGD) with department heads from Housekeeping, Engineering, F&B, Talent & Culture, Sales & Marketing, and Front Office validated and enriched the interview findings. Participants agreed that Mercure Bali Legian has adopted

several Green Performance Management elements, particularly KPI alignment and environmental monitoring. One participant noted: "Sustainability KPIs are clear at the organizational level, but employees often perceive them as management responsibilities rather than shared operational duties." Training and communication emerged as key themes: "Environmental training sessions are conducted, but frequency and follow-up are limited. New employees especially need continuous reinforcement." Participants also highlighted gaps in appraisal and recognition systems: "Green behaviour is encouraged, yet not formally embedded into individual performance evaluation or reward mechanisms." Despite these challenges, the FGD confirmed strong leadership commitment: "Management support for sustainability is evident through certifications, CSR programs, and departmental targets. The next step is translating this commitment into structured employee accountability."



(Source: Research Documentation, Mercure Bali Legian, 2025)

Figure 1. Focus Group Discussion

Discussions

The Influence of Green Performance Management on Employee Green Behaviour

This study discusses the role of Green Performance Management (GPM) in shaping Employee Green Behaviour (EGB) at Mercure Bali Legian. Quantitative results show that GPM has a positive and significant effect on EGB, with a moderate correlation ($r = 0.344$, $p = 0.001$). Regression analysis revealed that GPM explains 11.9% ($R^2 = 0.119$) of the variation in EGB, and the regression coefficient ($B = 0.292$) indicates that higher implementation of GPM leads to increased green behaviour. These findings confirm that while GPM is not the only determinant of EGB, it provides a measurable framework that encourages employees to adopt sustainable practices.

Qualitative insights from interviews and FGDs further highlight that although GPM initiatives such as green goal setting, training, and performance evaluation—are in place, their effectiveness is limited by inconsistent communication, lack of routine training, and underdeveloped feedback systems. Some employees are highly committed to sustainability, while others show lower engagement due to workload and operational barriers. This suggests that GPM must be complemented with enablers such as motivation, awareness, empowerment, and a supportive organizational culture.

The findings align with prior studies (Dumont et al., 2017; Paillé et al., 2014) which stress that while GPM provides structure, employee engagement and continuous reinforcement are essential for translating policies into behaviour. A conceptual model

presented during the FGD confirmed that GPM influences EGB, which in turn enhances environmental performance, though stronger staff-level accountability is needed.

Practically, these results underline the importance of regular training, clear performance expectations, structured feedback, and recognition mechanisms across all employee levels. Theoretically, they reaffirm that sustainability outcomes depend not only on management systems but also on behavioural and cultural integration. In conclusion, while Mercure Bali Legian demonstrates strong managerial commitment to green initiatives, advancing employee participation, communication, and evaluation processes remain critical to embedding a sustainable organizational culture.

The Green Performance Management at Mercure Bali Legian

According to Christianto (2020), the implementation of Green Performance Management (GPM) involves seven key indicators, including the development of an environmental management information system, integration of environmental goals into performance evaluation, and setting of targets that highlight the responsibility of employees in driving sustainability. Human resources play a critical role in the success of these practices, supported by the organizational environment and company commitment.

At Mercure Bali Legian, GPM is applied through several initiatives. First, the hotel established an Environmental Management Information System (EMIS) and conducts regular environmental audits via Accor's GAIA 2.0 platform, complemented by sustainability guidebooks and third-party certifications such as Green Key International, Tri Hita Karana Accreditation, and InterREACT risk management. These ensure systematic monitoring, compliance, and alignment with corporate ESG goals.

Second, the hotel integrates environmental objectives into performance evaluations through Accor's Sustainability Strategic Framework and 2025 Sustainability Projects, which include measurable targets such as energy reduction, elimination of single-use plastics, expansion of vegetarian menu options, and mandatory staff training. These goals are monitored regularly and tied to departmental KPIs.

Third, Mercure Bali Legian implements operational practices aligned with environmental standards, such as eliminating single-use plastics, adopting refillable amenities, using eco-friendly alternatives, and reducing food waste. Collaborations with partners like Winnow, Urban Compost, and Organic Factory Bali support data-driven food waste reduction and waste transformation into compost or protein. Waste management is further reinforced by segregation practices and partnerships with local recycling firms.

Fourth, environmental performance is embedded into departmental responsibilities, where KPIs for leaders in areas such as housekeeping, engineering, and culinary explicitly include sustainability-related targets like waste segregation, energy conservation, and food waste reduction. This creates accountability at the managerial level; however, the absence of individual performance evaluations for frontline staff limits inclusivity and broader behavioural change.

Fifth, the hotel sets clear environmental goals and targets under Accor's pillars of stay, eat, and explore, focusing on efficiency, responsible sourcing, and carbon footprint reduction, thereby aligning daily operations with long-term sustainability commitments.

Sixth, employee feedback mechanisms are implemented through awareness sessions, staff briefings, and notice boards, although these efforts face challenges of inconsistent delivery, scheduling conflicts, and limited engagement, reducing their overall effectiveness. Finally, evaluations of environmental performance are conducted collectively by department rather than individually, ensuring operational practices are monitored but leaving a gap in cultivating personal accountability. Overall, while Mercure

Bali Legian demonstrates strong commitment to Green Performance Management through structured systems, clear targets, and external partnerships, the lack of individualized assessments and consistent feedback mechanisms presents ongoing challenges to embedding sustainability culture across all staff levels.

Conceptual Model of Green Performance Management Implementation

The conceptual model of Green Performance Management (GPM) at Mercure Bali Legian was developed through an iterative integration of quantitative and qualitative findings. The model did not emerge solely from theoretical assumptions but was grounded in empirical evidence obtained from statistical analysis, interviews, observations, and Focus Group Discussions (FGD). This integrative approach ensured that the proposed framework reflects the operational realities of the hotel while maintaining theoretical relevance.

The quantitative findings provided the initial structural basis for the model. Statistical analysis revealed that Green Performance Management has a positive and statistically significant influence on Employee Green Behaviour (EGB), although the strength of the relationship was moderate. The regression results, with a determination coefficient ($R^2 = 0.119$), indicate that GPM contributes to shaping environmentally responsible employee behaviour but does not fully explain behavioural variation. These results suggest that while formal performance management mechanisms are important, their effectiveness depends on supporting organizational and behavioural factors. Consequently, the quantitative evidence informed the inclusion of core performance management elements within the model, including green goal setting, performance appraisal integration, monitoring processes, and feedback loops. This finding is consistent with Pham et al. (2019), who reported that while green HR practices positively influence environmental performance, the effect becomes stronger when supported by behavioural engagement mechanisms. The moderate explanatory power in this study similarly suggests that formal performance systems require reinforcement through employee-level integration.

Qualitative findings enriched and contextualized the quantitative results by explaining the underlying reasons for the modest effect size. Interviews with managers and department heads revealed that sustainability initiatives and environmental KPIs were clearly established at the organizational and managerial levels. However, gaps were identified in translating these objectives into consistent employee-level performance evaluation and daily behavioural practices. Several respondents emphasized that environmental performance indicators were not yet systematically embedded into individual staff appraisal systems. Observational data further supported these insights, showing that although sustainability infrastructure and green procedures were present, employee behavioural consistency varied depending on workload, supervision, and situational pressures.

The Focus Group Discussion (FGD) played a crucial role in validating and refining the conceptual model. Participants confirmed that while Green Performance Management practices were formally recognized, their implementation required stronger reinforcement mechanisms. Key themes emerging from the FGD included the need for continuous training, clearer individual accountability, integration of green KPIs into employee appraisal, and more structured feedback systems. These recurring patterns directly influenced the behavioural reinforcement and evaluation stages incorporated into the model. These findings are consistent with Jerónimo et al. (2020), who reported that the effectiveness of green HR practices depends on contextual and demographic factors, particularly employee awareness and reinforcement structures. Their findings

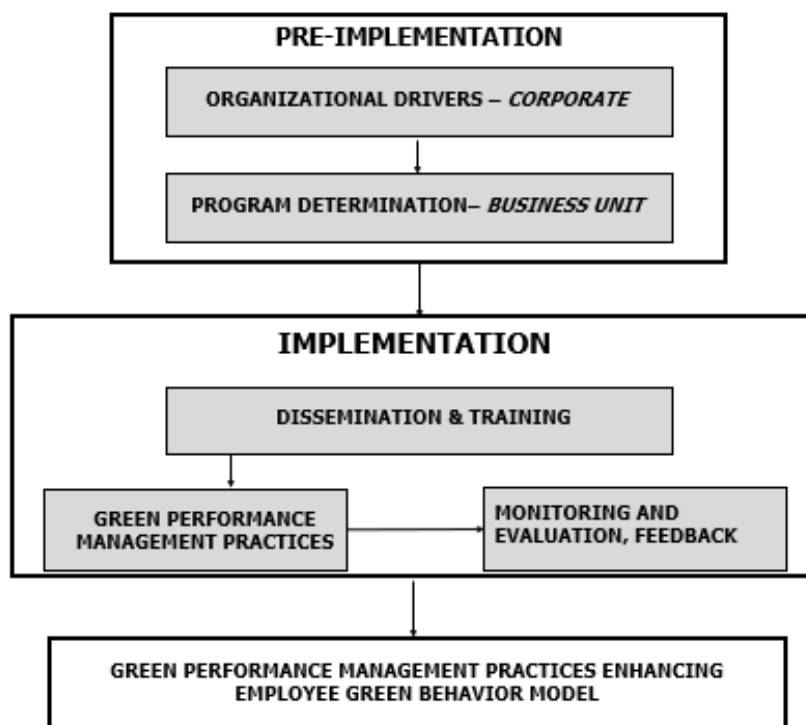
reinforce the argument that performance management mechanisms must be accompanied by continuous engagement to produce consistent behavioural outcomes.

The final model therefore emerged through triangulation and convergence of evidence across multiple data sources. Quantitative analysis established the existence and direction of the relationship between GPM and EGB, while qualitative exploration clarified implementation gaps and behavioural dynamics. By synthesizing these complementary insights, the study produced a stage-based implementation framework representing an empirically grounded model rather than a purely theoretical proposition.

Structurally, the model consists of interrelated stages beginning with pre-implementation conditions driven by corporate sustainability strategies and organizational drivers. This is followed by dissemination and training processes designed to build awareness and environmental competence. The central stage focuses on Green Performance Management practices, including environmental goal setting, performance appraisal alignment, recognition, and behavioural reinforcement. Subsequent stages involve monitoring and evaluation through audits and KPIs, structured feedback mechanisms, and impact measurement assessing changes in Employee Green Behaviour and environmental performance outcomes. Recent research by Yang and Li (2023) further supports the critical role of structured monitoring and feedback systems in translating sustainability policies into employee behavioural change. Their study highlights that green performance initiatives are most effective when integrated into daily operational routines and supported by measurable accountability mechanisms. This model addresses Research Question 2 by proposing an empirically grounded Green Performance Management framework designed to enhance Employee Green Behaviour and overall environmental performance at Mercure Bali Legian.

In practical terms, implementation of the model requires alignment between human resource systems, leadership practices, and operational routines. This includes embedding green KPIs into individual performance appraisal, conducting regular sustainability training, strengthening monitoring systems, providing structured feedback, and linking green achievements to recognition mechanisms. The findings indicate that although Mercure Bali Legian has implemented several components of this framework, greater integration at the employee performance level is necessary to enhance behavioural consistency and environmental outcomes.

Theoretically, this model contributes to Green Human Resource Management literature by bridging quantitative HR-performance relationships with qualitative behavioural insights. It explains how and why Green Performance Management Influences Employee Green Behaviour, particularly in contexts where sustainability systems are established but behavioural outcomes remain uneven. Practically, the framework offers hotel managers a structured roadmap for strengthening sustainability implementation through performance management mechanisms that are both measurable and behaviourally effective.



(Source: Research Result, Mercure Bali Legian, 2025)

Figure 2. Integrated Flowchart Model of GPM

Conclusions

This study concludes that Green Performance Management (GPM) practices positively influence Employee Green Behaviour (EGB) at Mercure Bali Legian, contributing to improved environmental performance, though the effect remains modest. Quantitative results show a statistically significant but moderate correlation ($r = 0.344$; $R^2 = 0.119$), indicating that while GPM initiatives such as departmental KPIs, sustainable sourcing, training, and waste reduction programs are in place, their impact is limited by weak employee-level accountability, irregular training, and insufficient feedback mechanisms.

Qualitative insights confirm that most practices are concentrated at the managerial level, with uneven behavioural adoption among staff. To address this gap, the study develops a conceptual model illustrating how GPM shapes EGB, which then drives environmental outcomes such as reduced resource use, minimized food waste, and elimination of single-use plastics. The model, validated through FGD, underscores the importance of consistent training, stronger accountability, continuous monitoring, and cross-departmental collaboration to fully embed sustainability into hotel operations.

Theoretically, this study contributes to the Green Human Resource Management literature by empirically demonstrating the mechanism through which Green Performance Management influences Employee Green Behaviour within a hospitality context. Unlike prior studies that primarily emphasize green training or recruitment practices, this research isolates the role of performance management and shows that its effect is positive but conditional upon reinforcement mechanisms such as feedback, accountability, and behavioural integration. By combining quantitative regression analysis with qualitative validation, this study also extends existing literature by proposing an empirically grounded implementation model rather than a purely conceptual framework.

Contextually, this study provides evidence from an internationally branded four-star hotel in Indonesia, a developing tourism destination where empirical research on GPM remains limited. The findings therefore enrich sustainability literature by offering insights from a real operational setting with structured corporate sustainability frameworks, certifications, and measurable KPIs.

Despite its contributions, this study has several limitations. First, the research was conducted as a single-case study at Mercure Bali Legian, which may limit the generalizability of findings to other hotel categories or destinations. Second, the quantitative model explains a modest proportion of Employee Green Behaviour, indicating that other factors such as leadership style, organizational culture, motivation, and reward systems were not captured in this study. Third, data were collected at one point in time, limiting the ability to observe behavioural change longitudinally.

Future research is therefore recommended to apply longitudinal designs, incorporate additional behavioural and motivational variables, and compare multiple hotels or tourism establishments across different regions. Further studies may also examine the role of green leadership, digital monitoring systems, and incentive mechanisms in strengthening the effectiveness of Green Performance Management. These directions will contribute to a more comprehensive understanding of how sustainability-oriented HR practices can drive long-term environmental performance in the tourism and hospitality sector.

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The Gastrodiplomacy Model as an Optimization of the Sustainable Tourism Sector in Semarang City

Kamal Ramadhani¹, Amir Mahmud^{2*}, Moch Faizal Rachmadi³

^{1,2}Department of Economic Education, Faculty of Economics and Business, Universitas Negeri Semarang, Indonesia

³Department of Economic Education, Faculty of Teacher Training and Education, Universitas Ivet, Indonesia

*Corresponding Author: amirmahmud@mail.unnes.ac.id

Abstract: Gastrodiplomacy has increasingly been recognized as a strategic approach to promote cultural identity and tourism development through culinary heritage. However, most existing studies focus on gastrodiplomacy at the national level, whereas research on city-level gastrodiplomacy models integrated with sustainable tourism systems remains limited. This study aims to examine the role of gastrodiplomacy in optimizing the sustainable tourism sector in Semarang City, Indonesia. This research employs a qualitative descriptive approach involving 20 informants representing the ABCGM stakeholders (academics, business actors, communities, government, and media). Data were collected through in-depth interviews, observation, and documentation. The validity of the data was ensured through source and methodological triangulation, and the data were analyzed using the Miles and Huberman interactive analysis model, including data reduction, data display, and conclusion drawing. The findings reveal that Semarang's gastrodiplomacy is manifested through three main culinary clusters: milkfish, herbal medicine, and *lumpia*, which function as cultural and economic assets for tourism promotion. The study identifies that the effectiveness of gastrodiplomacy depends on stakeholder collaboration, the development of culinary identity, tourism integration, and digital promotion strategies. This study proposes an integrated gastrodiplomacy model that connects culinary clusters, tourism destinations, transportation accessibility, and multi-stakeholder collaboration to strengthen sustainable tourism development. The findings contribute theoretically by expanding the gastrodiplomacy literature from a city-level sustainable tourism perspective, while offering practical policy insights for developing culinary-based destination branding and strengthening local economic resilience.

Keywords: Culinary, Gastrodiplomacy, Semarang City, Sustainable Tourism, Tourist Destinations.

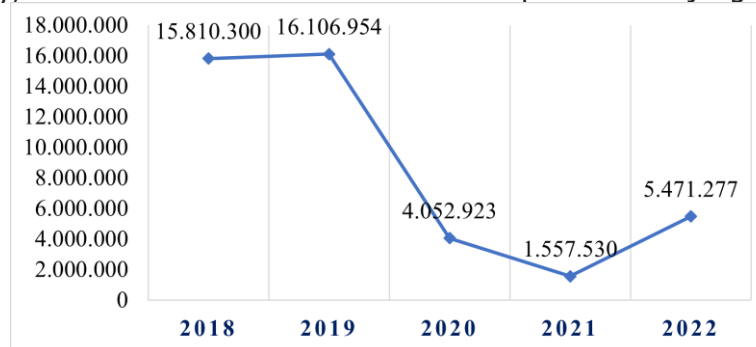
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Introduction

Indonesia's tourism sector is highly sought after by tourists, both domestically and internationally (Burhanudin & Unnithan, 2022; Pujiati et al., 2023; Yanto et al., 2024). As of 2022, foreign tourist visits to Indonesia totaled 5,471,277. Therefore, the government continues to strive to increase tourist visits by encouraging the tourism sector to improve, innovate, and optimally enhance all elements of its services (BPS, 2023; Pujiati & Imron, 2020; Prasetyo et al., 2022; Fafurida et al., 2020). Foreign tourists arrive in Indonesia through the main entry gates using various modes of transportation, including air, sea, and land. This transportation integration is essential for achieving tourist visitation targets and for optimally increasing the country's foreign exchange

earnings (Anggraini & Pujiati, 2022). One of the areas serving as the main entry point is Semarang City, home to Ahmad Yani International Airport and Tanjung Mas Port.



(Source: Central Statistics Agency of the Republic of Indonesia, 2023)

Figure 1. Statistics on Foreign Tourist Arrivals to Indonesia (Number of Visits)

Semarang, the capital city of Central Java Province, is a metropolitan city covering 373.78 square kilometers and has considerable potential in various sectors, particularly tourism. In 2022, Semarang City recorded 5,338,233 domestic tourists and 4,918 international tourists through its main entry points (BPS Semarang City, 2023). This high volume of activity and mobility presents a unique opportunity to increase tourist arrivals (Pujiati et al., 2020). However, the data also indicate that Semarang City has not been effective at attracting global tourists.

Semarang offers a diverse range of tourism attractions, including the Old Town, Lawang Sewu, Sam Po Kong Temple, the Great Mosque of Central Java (MAJT), and more (Pujiati et al., 2022). The city's natural, socio-cultural, historical, educational, and religious tourism elements are inseparable (Pujiati et al., 2016; Setiono et al., 2021). Semarang also offers public transportation via bus rapid transit, making it easy for passengers to get around at low cost and with adequate facilities (Septada et al., 2023). Not only that, Semarang City's culinary specialties, such as *lumpia*, soft-bone milkfish, and *wingko babat*, are also an inseparable part of the tourism sector, meaning they serve as souvenirs/gifts so that they can be widely known by the public (Sifa et al, 2023; Widowati et al, 2022).

It appears that the government has not been able to maximize this potential due to the lack of strategic integration between tourist destinations, transportation, and culinary offerings in Semarang. Therefore, an integrated cross-sector model is needed to enhance Semarang's appeal. The culinary sector plays a crucial role in promoting sustainable tourism in Semarang. The culinary sector is considered the most comprehensive and integrated effort to promote a region's tourism offerings to the wider public (Astuti et al., 2023). This effort is known as the gastrodiploacy model. Gastrodiploacy is a form of culinary-based cultural diplomacy that enhances a positive brand image and promotes the community comprehensively and sustainably (Nair, 2021). Semarang boasts a variety of culinary specialties, such as lumpia (spring rolls), soft-bone milkfish, and *wingko babat* (traditional Indonesian rice cakes), with diverse product variations that attract tourists.

Semarang possesses a variety of unique culinary products that could serve as instruments of gastrodiploacy. However, the culinary sector in Semarang is still dominated by small-scale Micro, Small, and Medium Enterprises (MSMEs) that operate independently and lack integrated promotional strategies (Prajanti et al., 2023). Culinary products are often positioned merely as souvenirs rather than being integrated into tourism experiences and cultural storytelling. Furthermore, issues such as inconsistent

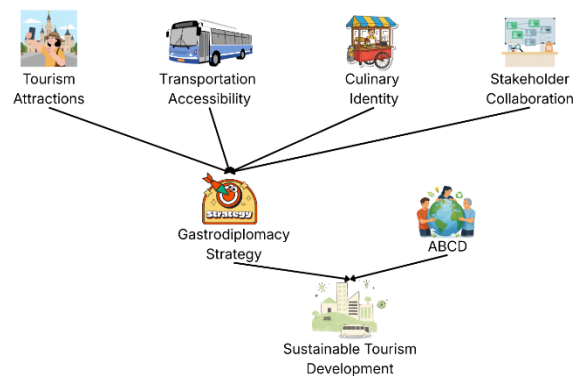
product quality, limited adherence to food safety standards, and inadequate packaging design continue to undermine the competitiveness of Semarang's culinary sector in the broader tourism market (Aprilia & Priantina, 2022).

Previous studies have highlighted the importance of stakeholder collaboration in tourism development, including the roles of government institutions, tourism operators, culinary entrepreneurs, local communities, and academics (Setiono et al., 2021). However, stakeholder involvement in promoting Semarang's cultural and culinary identity has not been optimally implemented. This condition has contributed to the gradual erosion of the Spirit of Place, which represents the unique cultural atmosphere and identity of Semarang as a tourism destination. To address this issue, integrating digital technology with human-centered tourism approaches has been proposed as a strategy to enhance visitor engagement and the tourism experience (Stankov & Gretzel, 2020).

In addition, community-based approaches such as Asset-Based Community Development (ABCD) emphasize local communities as key actors in tourism development by leveraging local cultural and economic assets (Ramadhani, 2025). Through collaborative engagement among stakeholders, culinary heritage and local tourism assets can be transformed into integrated tourism experiences that support sustainable development.

Although previous research has discussed tourism potential, cultural identity, and culinary promotion in various regions, several important research gaps remain. First, most gastrodiplomacy studies focus on national-level culinary diplomacy and country branding, whereas research on city-level gastrodiplomacy remains limited, particularly as a strategy for sustainable tourism development. Second, existing studies generally analyze culinary tourism as an independent sector, rather than examining how culinary identity can be integrated with tourism attractions, transportation systems, and community participation within a comprehensive tourism ecosystem. Third, there remains limited theoretical development of stakeholder-based gastrodiplomacy models that incorporate human-centered tourism and community-based development approaches.

Therefore, this study aims to fill these gaps by developing an integrated gastrodiplomacy model that connects tourism destinations, culinary sectors, transportation infrastructure, technology, and community participation to support sustainable tourism development in Semarang City. By integrating these elements, this study contributes to expanding the theoretical understanding of gastrodiplomacy as a multidimensional tourism development strategy rather than merely a culinary promotion tool. Based on these considerations, the research questions of this study are formulated as follows: 1) What roles do stakeholders play in developing a sustainable gastrodiplomacy model in Semarang City? 2) How can a stakeholder-based gastrodiplomacy model optimize the sustainable tourism sector in Semarang? To address these questions, this study proposes a conceptual framework that integrates gastrodiplomacy, stakeholder collaboration, human-centered tourism, and community-based development as key components in strengthening sustainable tourism in Semarang City.



(Source: Author Illustration, 2026)

Figure 2. The Conceptual Framework

Methodology

Research Approach and Design

This research uses a qualitative approach, which produces descriptive data. Qualitative methodology is defined as a research procedure that produces descriptive data in the form of written or spoken words from the people being observed. Researchers attempt to clearly and freely express the research situation or data description, ensuring it is accurate and factual. This aims to provide a precise picture of a particular individual, condition, symptom, or group, and to systematically describe the phenomenon under study based on the data obtained. The method used in this research is descriptive qualitative, which aims to systematically and factually describe the phenomenon of gastrodiplomacy practices and their contribution to sustainable tourism development. Through this design, the researchers attempt to provide a comprehensive depiction of stakeholder collaboration, culinary identity, and tourism integration within the gastrodiplomacy framework in Semarang City.

Research Focus

This research focuses on identifying and analyzing the role of gastrodiplomacy efforts in optimizing the sustainable tourism sector in Semarang City. The three food sectors studied are milkfish processing (Milkfish Cluster), herbal medicine processing (Jamu Cluster), and Lumpia Cluster. The three clusters were selected based on their culinary excellence in Semarang. Based on their history, arts and culture, and other factors, these three clusters contribute significantly to Semarang's gastrodiplomacy.

Research Data Sources

In qualitative research, researchers must identify potential data sources to answer research questions. Data sources are categorized into several groups, including: people, organizations, texts or articles, settings or environments, objects, and activities or events. The primary data sources in qualitative research are words and actions, with the remainder serving as supplementary data, such as documents and other sources. The words and actions of those observed or interviewed constitute the primary data source, captured through written notes, video/audio recordings, and photographs.

Data sources come from interviews with key informants. These key informants are members of the ABCGM (Academics, Business, Community, Government, and Media) elements. The academic element was selected from among those with expertise in food technology, culinary diplomacy, and related fields. Furthermore, in the business element,

the selected informants included business actors focused on processing soft-bone milkfish, herbal medicine, and spring rolls. On the community side, they also served as supervisors for the research implementation.

Meanwhile, the government element included relevant stakeholders in research, regional innovation development, fisheries, and the quality of processed fish products, among others. The media element came from parties that have a significant role in promoting local wisdom, food, arts and culture, and tourism in Semarang City. Supporting informants in this study provide information that complements that of the primary informants. Supporting informants include community members, local and village governments, tourists, and others.

This research focuses on identifying and analyzing the role of gastrodiplomacy initiatives in optimizing sustainable tourism in Semarang City. The study specifically examines three prominent culinary clusters that represent the city's gastronomic identity: 1) Milkfish Processing Cluster (Bandeng Presto Cluster), 2) Herbal Medicine Processing Cluster (Jamu Cluster), and 3) Lumpia Cluster. These three clusters were selected based on their historical significance, cultural value, economic contribution, and recognition as iconic culinary products of Semarang. These culinary sectors play an important role in shaping the city's gastronomic identity and have strong potential to support gastrodiplomacy initiatives that promote tourism and local culture.

Data Collection Technique

Data collection techniques describe or explain how researchers collect data, tailored to the type of research being conducted. The techniques used to collect the data required in this study were interviews, observation, and documentation. Data collection techniques are crucial in any research project, as they require complete, accurate, factual, and accountable data. Without understanding data collection techniques, researchers will not obtain data that meets established data standards. The data collection techniques used in this study included interviews, observations, and documentation.

Data collection in this study includes in-depth interviews, observation, and documentation.

1. In-depth interviews

Semi -structured interviews were conducted with all informants to explore their perspectives on culinary tourism development, stakeholder collaboration, and the role of gastrodiplomacy in promoting Semarang's tourism sector.

2. Observation

Direct observations were conducted in culinary production centers and tourist destinations to examine the interactions among culinary activities, tourism infrastructure, and visitor experiences.

3. Documentation

Documentation techniques were used to collect supporting materials, including photographs, policy documents, tourism development plans, promotional media, and archival records, related to Semarang's culinary and tourism sectors.

Data Validity Techniques

In qualitative research, data successfully extracted, collected, and recorded during the research process must be tested for validity and accuracy. Therefore, researchers must select and determine appropriate methods to establish the validity of the data obtained. The various data collection techniques must be appropriate and precise to obtain the data truly needed for the research. The implementation of these techniques

is based on several specific criteria. In this study, the validity and reliability of the data will be assessed by using source and technical triangulation techniques.

Source triangulation is the process of comparing and cross-checking the reliability of information obtained through different time periods and tools in qualitative research. This can be achieved, among other things, by comparing the results of interviews with one informant or source with those of another. Furthermore, this study uses technical triangulation to test the data's credibility by cross-checking it against the same source using different techniques.

Methodological triangulation was applied by comparing data obtained through different data collection techniques, namely interviews, observations, and documentation. The use of multiple methods helped strengthen the validity of the findings and ensured that the data accurately reflected the research phenomenon.

Data Analysis Techniques

The data analysis in this study used the Miles & Huberman model. Several steps were taken in data analysis, namely: 1) Data reduction. Data reduction is carried out by identifying units. Once the smallest unit is obtained, the next step is coding. Coding means assigning a code to each "unit" so that the data/unit can be traced to their source. Data coding plays a crucial role in qualitative research data analysis and determines the quality of the data abstraction. After coding, the researcher creates categories based on the interview results. 2) Data presentation. Data are obtained from various sources and then described using descriptive words or sentences, according to the qualitative approach used. In qualitative research, data are presented as brief descriptions, charts, relationships between categories, flowcharts, and similar tools. 3) Drawing conclusions. Conclusions can be deemed credible if the researcher's initial conclusions are supported by valid, consistent evidence.

Results and discussions

Results

The research data were obtained through interviews, observations, and documentation with various key informants. On the government side, data were collected at the Semarang City Culture and Tourism Office and the Semarang City Cooperatives and Micro Enterprises Office. This aimed to obtain accurate, comprehensive, and factual information and data, particularly regarding regulations and policies related to the development of the culinary and tourism sectors in Semarang City. In addition, data were collected from various relevant informants.

Milkfish Cluster

The Semarang City Milkfish Cluster was established based on Decree No. 050/174 of 2021 issued by the Head of the Semarang City Regional Development Planning Agency concerning the Management of the Semarang City Local Economic Development (PEL) Milkfish Cluster for the 2021-2024 term. This group was formed as a PEL effort to accelerate SMEs and absorb labor, particularly in the milkfish fishery sector. To date, the Milkfish Cluster has more than 50 members spread across various areas of Semarang City. Each member entity operates several businesses/products, including soft-bone milkfish, grilled milkfish, steamed milkfish, tofu meatballs, and other dishes. This was done because, with the changing times, the public's need for varied food is not limited to soft-boned milkfish but also includes other products.

Product diversification and the development of various types of milkfish products also meet market demand. Specifically, for soft-boned milkfish, the food processing technology used is a pressure cooker. In addition, several cluster members are implementing other food technologies to extend shelf life and maintain product quality, including retort sterilization. Various parties, including the Semarang City Fisheries Service, academics, Corporate Social Responsibility (CSR) organizations, and others, are also involved in mentoring, training, and skills development. The background is that milkfish is a hallmark of Semarang City, so the optimization of its production and processing is also underway. In terms of marketing, processed products from the Milkfish Cluster also help enliven various tourist attractions and busy centers in Semarang City.

Herbal Medicine Cluster

The Head of the Semarang City Herbal Medicine Cluster, Wahyuni, who was also interviewed during May, stated that the cluster currently has only 20 active members. Wahyuni has served as cluster head since 2021, while her herbal medicine business began in 2010. The herbal medicines sold are in powdered, dry, and wet forms. The market share for powdered and dry herbal medicines extends beyond Semarang City, while the wet form is limited to the city due to its short shelf life. The average monthly turnover is 15-20 million rupiah, a figure that fluctuates. Wahyuni explained that there are peak periods, particularly during the COVID-19 pandemic in 2020, driven by high demand for herbs and herbal medicines. Since then, sales have fluctuated, leading to a downward trend.

Several stakeholders, including the Semarang City Regional Development Planning Agency (Bappeda), play a central role. Their efforts include providing training in business management and marketing, integrating with various government agencies, and other areas. In addition to the Regional Development Planning Agency (Bappeda), the Semarang City Cooperatives and Micro Enterprises Office also plays a role. These include training, participation in bazaars, seminars, workshops, and other activities that can support sustainable business revenue. The Semarang City Agriculture Office also plays a role in optimizing the development of the herbal medicine cluster by providing technical assistance, increasing production capacity, providing machinery support, and other forms of support. However, challenges persist regarding model costs and slow cash flow. As previously mentioned, herbal medicine sales are currently significantly lower than in 2020.

Lumpia Cluster

Based on an interview with the Head of the Semarang City Lumpia Cluster (Hendro), the cluster has 36 members. In Semarang City, there are 16 sub-districts, and two representatives from each sub-district serve on the *lumpia* cluster. So, a total of 32 people, then added new members, bringing the total to 36 (data as of May 1, 2025). This cluster was formed based on a Decree (SK) from the Semarang City Bappeda to facilitate the *lumpia* food-processing business sector, which produces souvenirs and gifts typical of Semarang City. The characteristic of Semarang City *lumpia* originated in the Chinatown area, with *pilhi* fish filling. Kranggan Village in Central Semarang District was designated by the government as a center for *lumpia* skin production.



(Source: Personal Documentation, 2025)

Figure 3. Lumpia Skin Center in Kranggan Village, Semarang City

The advantage of *pahi* fish is its ability to neutralize the odor of bamboo shoots (urine) while also providing a distinct texture and flavor. Over time, various fillings have been added, including bamboo shoots, vegetables, meat, shrimp, dried shrimp, crab, and more. However, *lumpia* ideally only lasts 1-2 days at room temperature. Therefore, it is recommended to store it in the refrigerator/freezer to increase its shelf life. Furthermore, processed food in Semarang tends to be sweet. The cluster members' marketing reach includes Jakarta, Bandung, Lampung, Pati, Surabaya, Yogyakarta, and other areas.

The average sales turnover of *lumpia* cluster members can reach approximately 30-60 million rupiah per month. The Semarang City Health Office has played a significant role in the cluster, particularly in terms of hygiene and food-processing health. The *lumpia* cluster frequently receives guidance on food safety. Meanwhile, the Regional Development Planning Agency (Bappeda) also provides assistance, guidance, and training. The Semarang City Cooperative and Micro Enterprises Service also intensively provides assistance with business legality, such as Halal, NIB, P-IRT, and so on.

Stakeholder Collaboration in Culinary Tourism Development

The findings reveal that the development of culinary clusters in Semarang is strongly influenced by multi-stakeholder collaboration involving government institutions, business actors, communities, academics, and media. Government agencies such as Bappeda, the Tourism Office, the Fisheries Office, and the Cooperatives and MSME Office play important roles in providing training programs, regulatory support, and market facilitation. Business actors contribute through product innovation and market expansion, while academics provide technological assistance and research support. Media institutions help promote Semarang's culinary identity through digital platforms and tourism campaigns. This collaborative structure reflects the ABCGM (Academics, Business, Community, Government, Media) model, which forms the foundation for implementing gastrodiplomacy strategies at the city level.

Stakeholder Collaboration in Culinary Tourism Development

The results indicate that Semarang has strong potential to develop a gastrodiplomacy-based tourism model, owing to its distinctive culinary products, active culinary clusters, and stakeholder collaboration. However, several challenges remain, including limited integration between culinary clusters and tourism destinations, a lack of coordinated branding strategies for Semarang's culinary identity, uneven product standardization and

packaging quality, and limited international promotion of local culinary heritage. These findings highlight the need for a more integrated gastrodiploamacy framework that connects culinary heritage, tourism attractions, and stakeholder collaboration to enhance Semarang's global tourism competitiveness.

Discussions

Gastrodiploamacy is often conflated with culinary tourism, although the two concepts are distinct (Li & Mok, 2025). Gastrodiploamacy is a comprehensive culinary-based approach to attract or integrate with various aspects, from economic growth to tourism development. The goal is to introduce, increase, and promote a region through culinary channels. The concept of gastrodiploamacy in Semarang City, for example, integrates various aspects, including transportation, tourism, culinary arts, and other fields. This concept not only concerns national interests but also has implications for international policy (Yayusman et al., 2023). In this context, gastrodiploamacy serves not only as a promotional tool for food products but also as a strategic approach to enhance regional image and attract tourists through authentic culinary experiences.

The benefits of gastrodiploamacy are complex, ranging from economic growth and investment to community empowerment, increased food productivity, and accelerated tourism development. Therefore, optimizing humanistic and dynamic gastrodiploamacy is key to the success of culinary-based tourism development (Lee & Kim, 2021). The provision of facilities, accessibility, and mobility is integral to gastrodiploamacy. Easier access, communication, and public support facilities will increase interest in gastrodiploamacy transactions.

Optimizing gastrodiploamacy in Semarang City cannot be achieved without synergy and collaboration with various stakeholders. This synergy is not only national but also international, as a form of gastrodiploamacy expansion. Various stakeholders, including the central and regional governments, business actors, the community, and companies, must work together to optimize the role of gastrodiploamacy in Semarang City. Gastrodiploamacy can also be implemented during various activities, including festivals, bazaars, cultural discussions, and more (Eser & Karaosmanođlu, 2024). Such activities create opportunities for tourists to experience culinary products directly and strengthen the narrative of local cultural identity. Each stakeholder plays a different, complementary role across the three culinary clusters.

In the three culinary clusters, government institutions such as the Fisheries Service and Bappeda play a strategic role in cluster formation, training, and technological assistance. Candra & Setiawan (2013) stated that the Fisheries Service had provided assistance in the form of grants for processing equipment, particularly for milkfish products. Academics and CSR organizations contribute through mentoring and capacity building, while business actors focus on product diversification and market expansion. The community supports production activities and local branding, while media channels promote milkfish as Semarang's culinary identity. According to Akalili et al. (2025), culinary promotion, such as content creation that presents a complete narrative, street food, and the product manufacturing process, has its own appeal for audiences, encouraging them to try authentic local foods and even visit the area in person. That approach allows audiences not only to recognize local foods but also to develop emotional connections that motivate them to visit the destination.

The result also reveals that the implementation of gastrodiploamacy in Semarang remains fragmented and has not yet been integrated into a comprehensive tourism development strategy. Culinary products are still largely positioned as souvenirs or commercial products, rather than being fully integrated into tourism narratives and

destination experiences. This condition reflects the theoretical gap identified in the gastrodiploacy literature, where many studies focus primarily on national-level culinary diplomacy and offer limited analysis of city-level gastrodiploacy models linked to sustainable tourism systems.

One important finding of this study is the role of multi-stakeholder collaboration in supporting the development of gastrodiploacy. The results show that the development of culinary clusters in Semarang involves various actors within the ABCGM framework (Academics, Business, Community, Government, and Media). Government institutions such as the Semarang City Fisheries Office and the Regional Development Planning Agency (Bappeda) play strategic roles in facilitating cluster formation, providing training, and supporting technological innovation. Similar findings were also reported by Candra and Setiawan (2013), who emphasized the role of government assistance programs in improving the productivity and competitiveness of small-scale culinary industries.

Despite these opportunities, several structural challenges remain in optimizing gastrodiploacy in Semarang. These challenges include limited integration between culinary clusters and tourism destinations, uneven product standardization and packaging quality, and the absence of a coordinated city branding strategy centered on culinary identity. These findings indicate that gastrodiploacy in Semarang requires a more integrated framework that connects culinary production systems with tourism infrastructure, transportation accessibility, and cultural promotion.

From a sustainable tourism perspective, gastrodiploacy can function as a strategic instrument to strengthen local economies, empower communities, and preserve cultural heritage. The development of culinary clusters contributes not only to economic growth through MSME activities but also to the preservation of traditional food knowledge and cultural practices. This aligns with the concept of human-centered tourism, which emphasizes the involvement of local communities as active participants in tourism development.

Based on these findings, this study proposes that the optimization of gastrodiploacy in Semarang should be built upon three key components: culinary identity, stakeholder collaboration, and integrated tourism systems. By integrating these components, gastrodiploacy can serve as a comprehensive strategy that links local culinary heritage to tourism promotion and sustainable economic development. Therefore, the proposed gastrodiploacy model highlights the importance of synergy between culinary clusters, tourism destinations, transportation accessibility, and stakeholder collaboration. Such integration enables Semarang to strengthen its destination branding, enhance tourist experiences, and increase its competitiveness in the global tourism market.

Conclusions

In this study, gastrodiploacy manifests as food- and culinary-sector diplomacy. Specifically, in Semarang City, the government has sought to implement its gastrodiploacy program by establishing several community groups operating in the food and food-related sectors, including the Milkfish Cluster, the Herbal Medicine Cluster, and the Lumpia Cluster. These three clusters have distinct roles, duties, functions, and responsibilities in the conduct of gastrodiploacy. The Milkfish Cluster plays a role in promoting the fisheries sector's potential, particularly milkfish, which is abundant in Semarang's coastal areas. It not only engages in the buying and selling of fresh fish but also processes and diversifies milkfish products into various dishes such as soft-bone grilled milkfish, steamed milkfish, tofu, milkfish meatballs, etc.

Meanwhile, the Lumpia Cluster promotes the history, art, and culture of *lumpia* from its inception in Semarang to the present day, serving as a landmark and a leading souvenir of the city. Long story short, *lumpia* was originally sold in Semarang's Chinatown area. This tradition has continued and been passed down from generation to generation. Lumpia variations are also very diverse, with fillings including bamboo shoots, vegetables, noodles, fish, and other fillings. This reflects the creativity and innovation of entrepreneurs without diminishing the *lumpia's* artistic and cultural significance. Furthermore, there is a herbal medicine cluster that conducts Semarang's gastrodiplomacy based on spices produced in the agricultural sector. Businesses in the herbal medicine cluster strive to practice culinary diplomacy grounded in local wisdom and to utilize the abundance of medicinal plants in Semarang.

Beyond their individual roles, the findings highlight the importance of multi-stakeholder collaboration involving government institutions, business actors, communities, academics, and media within the ABCGM framework. This collaboration supports capacity building, product development, marketing strategies, and regulatory facilitation for culinary businesses. However, the study also identifies several challenges, including limited integration between culinary clusters and tourism destinations, uneven product standardization, and the absence of a coordinated city-branding strategy grounded in culinary identity.

From a theoretical perspective, this study contributes to the development of gastrodiplomacy literature by proposing a city-level gastrodiplomacy model that integrates culinary identity, stakeholder collaboration, and tourism systems. Unlike previous studies that often focus on national culinary diplomacy, this research highlights the role of local culinary clusters as strategic actors in strengthening destination branding and sustainable tourism development. The proposed gastrodiplomacy model emphasizes integrating culinary heritage, tourism destinations, transportation accessibility, and digital promotion strategies to create a comprehensive tourism ecosystem. Through this integrated approach, gastrodiplomacy can function not only as a cultural promotion tool but also as a strategic instrument for sustainable tourism development, local economic growth, and community empowerment.

Practically, the findings suggest that policymakers in Semarang should strengthen collaboration among stakeholders, improve product standardization and packaging quality, and integrate culinary promotion with tourism destination management. The development of culinary festivals, storytelling-based marketing, and digital promotion can further enhance the visibility of Semarang's gastronomic identity at the national and international levels. Future research may expand this study by examining the implementation of gastrodiplomacy strategies in other cities or by employing mixed-method approaches to quantitatively measure the impact of gastrodiplomacy on tourism competitiveness and visitor behavior.

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Hidden in Plain Sight: The Glass Kitchen and Women's Culinary Innovation in Rural Tourism

Luh Putu Kartini

Department of Culinary Arts, Bali Tourism Polytechnic, Indonesia

Corresponding Author: kartini@ppb.ac.id

Abstract: Sustainable gastronomy has become an important lens for understanding how rural tourism can connect food heritage, local ingredients, community livelihoods, and more responsible forms of development. Yet, within many rural tourism villages, the everyday culinary practices that sustain local food systems often remain hidden behind destination branding and formal tourism planning. This study examines this overlooked dimension through the concept of the “glass kitchen”, a metaphor used to describe women’s culinary labour as highly visible in daily community life but structurally invisible within tourism governance and economic recognition. Based on fieldwork in Angseri and Tegaljadi, two rural tourism villages in Bali, this research adopts a qualitative exploratory approach involving semi-structured interviews, field observations, and focus group discussions with 45 participants engaged in food production, tourism coordination, village governance, and community-based culinary activities. Thematic analysis reveals three interconnected findings: the persistence of indigenous ingredients and household-based food production, the emergence of informal culinary innovation through everyday experimentation, and the gendered organisation of culinary labour within rural tourism systems. The findings show that culinary innovation often emerges gradually from domestic kitchens, inherited knowledge, seasonal resources, and adaptive practices rather than from formal enterprises. However, these contributions remain weakly integrated into tourism narratives and decision-making structures. By advancing the glass kitchen concept, this study contributes a gender-sensitive perspective to sustainable gastronomy and rural tourism studies, arguing that inclusive tourism development requires recognition of women’s everyday culinary labour as cultural heritage, social practice, and economic potential.

Keywords: culinary innovation, gendered labour, glass kitchen, sustainable gastronomy, rural tourism.

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Introduction

Food has increasingly moved beyond its traditional function as nourishment and entered broader discussions surrounding culture, sustainability, and regional development. Within tourism scholarship, food is widely recognised as a cultural resource capable of shaping place identity, supporting local economies, and enriching visitor experiences (Balderas-Cejudo et al., 2025; Green et al., 2015; Nyberg et al., 2022; Richards, 2015). This growing recognition has contributed to the development of sustainable gastronomy, an interdisciplinary perspective that links culinary heritage with ecological responsibility, cultural continuity, and community wellbeing (Nyberg et al., 2022). Rather than focusing solely on restaurants or culinary consumption, sustainable gastronomy emphasizes the relationships among landscapes, food producers, traditional knowledge, and local communities that collectively shape food systems (Malinowska et al., 2024; Reynolds, 2020).

Within tourism contexts, gastronomy plays an important role in creating meaningful visitor experiences and strengthening territorial identity. Local food traditions enable destinations to differentiate themselves while promoting cultural authenticity and environmental sustainability (Balderas-Cejudo et al., 2025; Yubianto, 2023). Gastronomy tourism therefore extends beyond the act of eating; it encompasses the narratives, agricultural practices, and community knowledge that give meaning to food within particular places (Resmi et al., 2023; Richards, 2012). Through this perspective, food becomes both a cultural expression and a development resource capable of supporting more sustainable forms of tourism.

Despite this growing recognition, much of the existing gastronomy literature remains concentrated on urban and commercial culinary environments. Research frequently focuses on restaurants, celebrity chefs, gastronomic branding, or formal food enterprises, while everyday culinary practices in rural communities receive comparatively less scholarly attention (Balderas-Cejudo et al., 2025; Mulcahy, 2015; Reynolds, 2020; Romanova do Nascimento Costa et al., 2025). This emphasis tends to obscure the importance of rural food systems as spaces where culinary knowledge, agricultural diversity, and cultural traditions intersect.

In many rural settings, food production and preparation are embedded within household routines, seasonal agricultural cycles, and community relationships rather than professional culinary industries (Cheng, 2023; Cheng et al., 2024; Giamporcaro et al., 2025). These everyday practices represent living knowledge systems transmitted across generations through informal learning processes. They involve not only recipes but also knowledge of local ingredients, seasonal availability, preparation techniques, and cultural meanings associated with food (Resmi et al., 2023; Widjaja, 2020). As such, rural culinary practices constitute an important cultural asset that can contribute to both heritage preservation and local economic development.

This gap becomes particularly evident within rural tourism development, where planning frameworks often prioritize physical infrastructure, accommodation facilities, and landscape attractions (Ernawati et al., 2022; Lang, 2019). While natural scenery and cultural performances are frequently highlighted in tourism promotion, everyday culinary practices are often treated as complementary elements rather than central components of tourism experiences (Giamporcaro et al., 2025; Rosalina et al., 2023). Such an approach underestimates the potential of local food practices to communicate place identity, sustain cultural heritage, and generate community-based economic opportunities.

Indonesia's tourism village initiatives provide an important context for examining these dynamics. Tourism villages are designed to promote community-based development by integrating local culture, natural resources, and everyday life into tourism experiences (Cecep, 2021; Wahyuni, 2017). Through this model, visitors are encouraged to engage directly with local traditions, agricultural practices, and community activities. However, in many tourism villages, culinary practices remain only partially integrated into tourism planning (Sukerti & Marsiti, 2020; Suriani & Ariani, 2020). Traditional foods may appear during festivals or special events, yet everyday food preparation and household culinary knowledge often remain outside formal development strategies.

Within these rural food systems, culinary innovation frequently emerges from informal community practices rather than from professional kitchens or commercial enterprises. Local residents continuously adapt traditional recipes, experiment with available ingredients, and develop new food products based on seasonal resources and changing social conditions (Guiné et al., 2021; Kartini et al., 2025; Sukerti & Marsiti,

2020). Because such innovation occurs within household and community contexts, it is often overlooked in conventional tourism development models that prioritize standardized products and formal businesses.

At the same time, these everyday food practices are closely connected to gendered divisions of labour. In many rural communities, women play central roles in food preparation, ingredient management, and the transmission of culinary knowledge within families and communities (Adnyani, 2023; García-Henche et al., 2024; Kartini et al., 2025). Through these activities, women contribute significantly to both household food systems and the preservation of local culinary traditions (Baghdadi, 2019; Lusiana et al., 2022). Despite their central role, however, this labour is rarely recognised within formal tourism development frameworks, as culinary work carried out in domestic or semi-informal settings often falls outside official definitions of entrepreneurship or tourism employment.

This article builds upon preliminary research in 2025 and expands the analysis through deeper field data interpretation and conceptual development. Initial exploratory research conducted in Desa Angseri revealed that women's culinary labour plays a central role in everyday food production while remaining largely absent from formal tourism decision-making processes. Building on these insights, the present study advances the concept of the "glass kitchen." Borrowing metaphorically from the notion of the "glass ceiling," the glass kitchen describes a condition in which women's culinary contributions are highly visible in daily community life yet structurally invisible within tourism governance and economic recognition. Although women are widely acknowledged as custodians of local food traditions, their roles frequently remain confined to informal or supportive positions rather than leadership roles within tourism initiatives.

To explore these dynamics, this study adopts sustainable gastronomy as its conceptual framework. Within this perspective, gastronomy is understood as an integrated system linking food production, culinary practices, cultural heritage, environmental sustainability, and community livelihoods. Culinary practices are therefore interpreted not merely as technical activities but as everyday expressions of gastronomic culture embedded within social and ecological contexts.

Building on these gaps, this study examines the relationship between everyday culinary practices, gendered labour, and rural tourism development. Specifically, it explores how everyday culinary activities and locally available ingredients are mobilized within rural tourism contexts, how gendered roles influence the organisation and visibility of culinary labour in tourism villages, and how informal culinary innovation emerging from daily practices contributes to sustainable gastronomy and community-based tourism development.

To address these questions, the study adopts a qualitative research design that enables an in-depth exploration of everyday culinary practices, gendered labour structures, and informal innovation within rural tourism contexts. Fieldwork was conducted through semi-structured interviews, participant observation, and documentation of culinary practices involving local ingredients and household food production. The empirical investigation focuses on two tourism villages in Tabanan Regency, Bali—Desa Angseri and Desa Tegaljadi—both of which possess strong agricultural traditions and emerging tourism activities while their culinary practices remain largely embedded in informal household systems rather than formal tourism enterprises. Through thematic analysis, the study identifies patterns of culinary knowledge circulation, gendered labour organisation, and informal innovation within rural gastronomy systems.

Methodology

This study adopts a qualitative exploratory approach to examine how everyday culinary practices are embedded within rural tourism contexts. A qualitative design enables the research to capture the social meanings, local knowledge, and gendered dynamics that shape food production and culinary activities in village settings, which are often embedded within everyday community practices and informal knowledge systems (Giamporcaro et al., 2025; Malinowska et al., 2024; Reynolds, 2020). The study follows an interpretivist perspective, focusing on how local actors understand and organize culinary practices within emerging tourism development. Fieldwork was conducted in two rural tourism villages in Tabanan Regency, Bali: Desa Angseri and Desa Tegaljadi. Both villages are characterized by strong agricultural traditions and growing tourism initiatives that incorporate local cultural and natural resources. These settings provide an appropriate context for examining how local food practices contribute to rural tourism development and community-based gastronomy. Participants were selected using purposive sampling (Haryono & Wardoyo, 2015; Sugiyono, 2015), focusing on individuals directly involved in culinary production, food entrepreneurship, tourism coordination, and village governance.

Table 1. Profile of Research Participants

Code	Role	Gender	Affiliation	Main Activity	Age	Experience
R01	Culinary micro-entrepreneur	Female	Independent	Produces traditional snacks for visitors	41–50	10+ yrs
R02	Culinary micro-entrepreneur	Female	BUMDes cooperative	Develops herbal-based food products	31–40	7 yrs
R03	Culinary micro-entrepreneur	Female	Pokdarwis	Runs food stall near tourism site	51–60	15+ yrs
R04	Local food vendor	Male	Independent	Manages seasonal food stall	31–40	5 yrs
R05	Culinary unit manager	Male	BUMDes	Oversees village culinary enterprise	41–50	12 yrs
R06	Tourism group member	Male	Pokdarwis	Coordinates culinary tourism activities	31–40	6 yrs
R07	Village Head (Angseri)	Male	Village Office	Policy on culinary–tourism integration	51–60	10+ yrs
R08	Village Head (Tegaljadi)	Male	Village Office	Supports village culinary initiatives	41–50	9 yrs
R09	Customary council member (Angseri)	Male	<i>Adat</i> Council	Advocates preservation of local ingredients	61+	20+ yrs
R10	Customary council member (Tegaljadi)	Male	<i>Adat</i> Council	Oversees customary norms in food practices	61+	20+ yrs

Code	Role	Gender	Affiliation	Main Activity	Age	Experience
R11	Home-based food processor	Female	Independent	Produces fermented condiments	41–50	8 yrs
R12– R45	Community participants (FGDs & interviews)	Mixed	Mixed groups	Shared views on culinary heritage and tourism integration	Mixed	5–30+ yrs

Source: Field Data (2025)

As summarized in Table 1, the study involved 45 participants, including 12 key informants representing various roles within the rural culinary system, such as culinary micro-entrepreneurs, local food vendors, BUMDes representatives, tourism awareness group members, village leaders, customary council members, and a young entrepreneur. In addition, 33 community participants contributed through focus group discussions and supporting interviews, providing broader perspectives on culinary heritage, local ingredients, and the integration of gastronomy within rural tourism. Data collection was conducted between April and October 2025 through semi-structured interviews, participant observation, and focus group discussions (FGDs).

The collected data were analyzed using thematic analysis following Braun and Clarke (2006). Interview transcripts, discussion records, and field notes were coded inductively to identify recurring patterns related to everyday culinary practices, gendered roles in culinary labour, and local food innovation. The interpretation of themes was guided by the conceptual lens of sustainable gastronomy and the notion of the “glass kitchen,” enabling the analysis to examine how culinary practices, gendered labour, and informal innovation intersect within rural tourism development. By integrating community-based gastronomy perspectives with a gender-sensitive analytical lens, this methodological approach allows the study to capture the often-overlooked role of everyday culinary labour in shaping rural tourism systems. The analysis revealed several recurring patterns in how culinary practices are mobilized within rural tourism settings, which are presented in the following section.

Results and discussions

Results

Thematic analysis of interviews, FGDs, and participant observations generated three interconnected themes that explain how rural gastronomy is practiced and negotiated within the tourism villages studied (Braun & Clarke, 2006). These themes reflect patterns observed across both Angseri and Tegaljadi villages: (1) everyday culinary practices and the role of local ingredients, (2) the emergence of informal culinary innovation within household food systems, and (3) the gendered organisation of culinary labour, conceptualized in this study as the “glass kitchen.” Together, these themes illustrate how culinary knowledge circulates within rural communities and how everyday food practices intersect—often unevenly—with tourism development.

Everyday Culinary Practices and Local Ingredients in Rural Tourism

Across the two villages studied, everyday culinary practices emerge through different yet complementary forms of rural food production. Field data reveal that several indigenous ingredients in Angseri—although deeply embedded in everyday culinary

practices—remain largely absent from formal tourism offerings. Ingredients such as *kecombrang* (torch ginger) and *rebung* (bamboo shoots) are widely consumed in domestic cooking but rarely appear in curated menus or value-added products aimed at visitors. This discrepancy illustrates how culinary biodiversity that is actively practiced within the community remains largely absent from tourism-oriented food offerings. Rather than reflecting a lack of ingredients, this invisibility stems from how these ingredients are perceived and positioned—commonly regarded as ordinary household components rather than marketable culinary assets.

Several interviews underscored this divide between everyday use and potential innovation. One culinary micro-entrepreneur explained:

“We always use *kecombrang*, especially for soup or sambal. But it’s not something you’d find in the food for visitors. It’s for us, not for display,” (P03, Female, Culinary Micro-entrepreneur).

This perception reflects a symbolic distinction between “home food” and “tourist food.” Ingredients commonly used in domestic cooking are often perceived as too ordinary for tourism presentation, even though they represent important elements of local culinary identity.

A case from a young female returnee (P10) illustrates this emerging potential. She experimented with bottling *sambal kecombrang* using recycled glass jars and simple hand-drawn labels, envisioning a product that could combine ecological values with place-based identity. However, due to limited access to marketing knowledge and mentorship, the initiative remained informal and confined within family networks.

“I tried bottling sambal kecombrang, just to see how it looks. My cousin helped design the label. But I don’t know if I’m ready to sell it yet—it’s still just for fun.” (P10, Female, Young Entrepreneur)

This example illustrates how culinary creativity already exists within the village but often remains in an embryonic stage, relying on informal experimentation and limited visibility. The case highlights a broader gap between grassroots culinary creativity and the institutional pathways needed to transform such ideas into tourism-linked products.

Participant observations further confirmed that many indigenous ingredients are harvested seasonally and frequently used in rituals or communal meals. During FGDs in Angseri, several elders spoke with pride about the medicinal and symbolic significance of *kecombrang*, yet none had previously considered presenting it as part of the village’s culinary identity for visitors. The absence of visual branding, recipe standardization, and institutional support for experimentation contributes to the limited visibility of these ingredients within tourism narratives.

In contrast, Tegaljadi village shows a stronger presence of traditional snack production. Several households are engaged in producing snacks commonly consumed in daily meals and religious offerings. These include *kripik bayam* (spinach chips), *keripik singkong* (cassava chips), *keripik ubi* (sweet potato chips), *keripik kedele* (soybeans crackers), *keripik kacang ijo* (mungbean crackers), *kaliadrem*, and *jaje reta*. Many of these foods are prepared by home-based producers who specialize in traditional snacks for *banten* (religious offerings) as well as everyday consumption. Despite their cultural significance, these products remain largely confined to local markets within the Marga area of Tabanan. Packaging and branding are generally minimal, often consisting of simple plastic wrapping without standardized labeling or product narratives. As one participant noted:

"We make these snacks almost every day, especially for banten or family events. Sometimes people from nearby villages order them, but we usually sell them only around here." (R34 & R35, FGD participant, Tegaljadi).

Table 2 summarizes several ingredients frequently mentioned during interviews and FGDs, alongside their common uses and current position within local tourism activities.

Table 2. Local Ingredients and Traditional Food Production in Angseri and Tegaljadi

Village	Ingredient / Product	Local Name	Common Local Use	Tourism Presence	Production Pattern
Angseri	Torch ginger	<i>Kecombrang</i>	Sambal, soup aroma, ceremonial offerings	Absent from tourist menus	Household cooking
Angseri	Bamboo shoot	<i>Rebung</i>	Vegetable dishes in ceremonial meals	Informally sold	Seasonal harvest
Angseri	Fern shoots	<i>Paku</i>	Stir-fried greens in home dishes	Used at household level	Seasonal gathering
Tegaljadi	Spinach chips	<i>Keripik Bayam</i>	Daily snack, community consumption	Limited tourism exposure	Home-based production
Tegaljadi	Cassava chips	<i>Keripik Singkong</i>	Snack for daily consumption and banten	Sold locally	Small household industry
Tegaljadi	Sweet potato chips	<i>Keripik Ubi</i>	Local snack	Sold locally	Home production
Tegaljadi	Soybean crackers	<i>Keripik Kedelai</i>	Snack and ritual food	Local market only	Home production
Tegaljadi	Mungbean crackers	<i>Keripik Kacang Ijo</i>	Snack and ritual food	Local market only	Home production
Tegaljadi	Traditional cake	<i>Kaliadrem</i>	Ceremonial food and daily snack	Not integrated in tourism	Household production
Tegaljadi	Traditional cake	<i>Jaje Reta</i>	Ritual offering and snack	Not integrated in tourism	Household production

Source: Fieldwork Observations & Transcripts (2025)

Participant accounts, supported by observational data, demonstrate how several underutilized ingredients hold strong cultural relevance but remain absent from culinary tourism narratives. The comparison illustrates two distinct yet complementary forms of rural gastronomy. In Angseri, culinary identity is closely tied to indigenous ingredients embedded in agricultural landscapes. In contrast, Tegaljadi demonstrates a stronger tradition of household-based snack production associated with ritual food preparation and everyday consumption. Taken together, these findings reveal a gap between the agro-ecological richness of local food practices and their representation within tourism offerings. Rural culinary traditions in both villages are sustained through everyday practices and community knowledge, yet they remain only partially integrated into the economic and narrative frameworks of rural tourism.

Informal Culinary Innovation in Everyday Practices

While local ingredients provide the raw materials of rural culinary identity, field data indicate that innovation in the villages does not primarily emerge through institutional entrepreneurship or formal tourism initiatives. Instead, culinary innovation develops through everyday improvisation within household food systems. In both Angseri and Tegaljadi, residents adapt recipes, experiment with locally available ingredients, and modify preparation techniques in response to seasonal availability, taste preferences, or small economic opportunities. These activities typically occur in domestic kitchens rather than formal production spaces, and they are rarely recognised locally as “innovation.” Rather, they are understood as practical adaptations embedded within routine cooking and caregiving practices.

In Angseri, innovation often appears through experimentation with indigenous ingredients that are already embedded in local culinary traditions. Several participants described testing new ways of processing or presenting ingredients that are commonly used in domestic cooking. One young returnee (P10), for instance, experimented with drying *kecombrang* petals to produce a herbal tea product that she occasionally shared with homestay guests as a wellness beverage. Another participant (P02) described infusing turmeric and lemongrass into massage oils, which she packaged in reused bottles and sold informally to visitors. Meanwhile, P09—an older home-based processor—revived an ancestral preparation using fermented *rebung* (bamboo shoots) to enhance soups and broths. These examples illustrate how culinary experimentation in Angseri emerges through trial-and-error learning, family knowledge, and adaptive use of local ingredients, rather than through formal entrepreneurial training. Although these initiatives occasionally intersect with tourism activities, they typically remain small in scale and embedded within household networks.

A somewhat different pattern can be observed in Tegaljadi, where innovation occurs primarily within the village’s established snack production traditions. Instead of developing entirely new products, producers often modify existing recipes, adjust seasoning levels, or refine frying techniques in response to local demand. Producers rarely frame these adjustments as innovation; instead, they describe them as routine improvements to family recipes that have been prepared for generations. Nevertheless, these incremental modifications illustrate another form of culinary creativity embedded within everyday food production practices.

Table 3 summarizes several examples of these everyday innovations observed during fieldwork.

Table 3. Selected Everyday Culinary Innovations in Angseri and Tegaljadi

Village	Ingredient Used	Form of Innovation	Context of Use
Angseri	Kecombrang (<i>Etlingera elatior</i>)	Dried herbal tea	Shared with homestay guests as wellness beverage
Angseri	Turmeric, lemongrass	Infused massage oil	Sold informally to visitors
Angseri	Rebung (bamboo shoot)	Revived fermented condiment recipe	Used domestically, tested for small sales
Tegaljadi	Cassava	Adjustment of seasoning and frying technique for cassava chips	Sold locally within Marga
Tegaljadi	Spinach	Modification of batter composition in spinach chips	Produced for daily snacks and ritual food

Tegaljadi	Rice flour, palm sugar	Recipe adjustments in <i>kaliadrem</i> preparation	Produced for banten and family events
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Source: Field Data (2025)

As illustrated in Table 3, everyday culinary innovation in both villages tends to develop through incremental experimentation within existing food traditions rather than through the creation of entirely new culinary products. In Angseri, innovation is often associated with transforming indigenous ingredients into alternative product forms. In contrast, innovation in Tegaljadi is more closely tied to gradual adjustments within established snack production practices. Despite these differences, both patterns reflect a broader form of grassroots culinary creativity that remains largely embedded within domestic spaces and informal community networks.

These observations suggest that rural communities already possess significant innovative capacity within their everyday food systems. However, because these practices remain informal and small in scale, they rarely become visible within tourism narratives or formal culinary development initiatives. As the next section will show, the invisibility of these innovations is also closely linked to the gendered organisation of culinary labour within the villages.

The Glass Kitchen: Gendered Organisation of Culinary Labour

While everyday culinary practices and informal innovations sustain rural gastronomy in both villages, field data reveal that these activities are strongly shaped by gendered divisions of labour. Women play a central role in food preparation, ingredient processing, and the transmission of culinary knowledge across generations. Much of the culinary creativity observed during fieldwork—including experimentation with ingredients, snack production, and recipe adaptation—takes place within household kitchens and is largely carried out by women. Despite this central role, women’s culinary labour often remains positioned within domestic spaces and informal economic activities.

This pattern is conceptualized in this study as the “glass kitchen.” Borrowing metaphorically from the notion of the glass ceiling, the term describes a situation in which women’s culinary labour is highly visible in everyday village life yet remains structurally invisible within tourism governance and decision-making processes. Women are widely recognised as the individuals who prepare food, maintain culinary traditions, and manage small-scale food production. However, their knowledge and contributions rarely translate into strategic roles within village tourism planning or culinary development initiatives.

Interview data illustrate how women’s culinary work is frequently framed as an extension of domestic responsibilities rather than as entrepreneurial or professional activity. For example, one participant who had operated a small food stall near a local attraction for several years explained that although tourists regularly purchased her food, she had never been involved in discussions regarding the village’s tourism programs.

“I have been selling food here for years, and tourists come regularly. But when the village discusses tourism plans, no one asks us about the food.” (P03, Female, Food Vendor)

Similar dynamics were observed in Tegaljadi, where many snack producers are women working from their homes. Although these producers contribute to local food supply and occasionally sell products to visitors, their activities are often described as household work rather than as tourism-related enterprises. In contrast, formal roles

related to tourism management, branding, and strategic planning are more frequently held by male actors within village institutions.

Table 4 illustrates this imbalance between culinary labour and institutional influence.

Table 4. Gendered Division of Labour and Visibility in Culinary Tourism

Participant Code	Role in Culinary System	Culinary Activity	Tourism Visibility	Involvement in Decision-Making
P14	Home-based snack producer	Produces traditional snacks for visitors	Medium (warung-level only)	None
P15	Home-based processor	Produces herbal-based culinary products	Low	None
P20	Food stall operator	Manages food stall near waterfall site	High (tourist-facing)	Low
P21	Fermented food producer	Prepares fermented rebung condiments	Low (household level)	None
R38	Snack producer (Tegaljadi)	Produces cassava and spinach chips	Medium (local sales)	None
R39	Ritual snack producer (Tegaljadi)	Produces kaliadrem and jaje reta	Medium (ritual & local market)	None
P05 (male)	Village culinary planner	Coordinates village culinary programs	Low (non-cooking role)	High
P37 (male)	Village leadership	Supports tourism-related culinary initiatives	Medium	High

Source: Field Data (2025)

Although women dominate everyday culinary production across both villages, their representation in tourism governance structures remains limited, as reflected in the distribution of roles shown in Table 4. As shown in Table 4, women often sustain the everyday culinary activities that shape visitors' food experiences, yet they remain largely excluded from strategic decision-making processes. Male actors, meanwhile, are more likely to occupy roles associated with tourism planning and institutional governance, even when they are not directly involved in food production.

The concept of the "glass kitchen" therefore captures a key paradox within rural gastronomy systems: culinary knowledge and creativity are highly visible within everyday practices but remain structurally marginalised within tourism development frameworks. Women's labour sustains the flavors, techniques, and culinary heritage of the village, yet their roles remain largely confined to the private or semi-private spaces of household kitchens. This dynamic helps explain why many forms of culinary innovation observed in the villages remain informal and small in scale. When the individuals driving culinary experimentation operate primarily within domestic spaces and lack access to tourism decision-making networks, their innovations often remain embedded within household economies rather than evolving into visible gastronomic offerings.

Discussions

The findings of this study reveal that culinary innovation in Angseri and Tegaljadi does not primarily emerge from formal entrepreneurship, institutional planning, or

professional culinary enterprises. Instead, it develops through everyday practices embedded in household routines, agricultural landscapes, ritual obligations, and gendered forms of knowledge transmission. Across both villages, culinary innovation appears through the adaptive use of local ingredients, the refinement of inherited recipes, and small-scale experimentation responding to seasonal availability, local demand, and emerging tourism encounters. This finding challenges dominant models of tourism development that tend to privilege formalised culinary enterprises, gastronomic routes, and curated destination branding (Cheng, 2023; Cheng et al., 2024; Fernández & Irimia-Diéguez, 2025; Rosalina et al., 2023; Vieira et al., 2024; Wan et al., 2025). Rather than treating innovation as something that occurs only within commercial or institutional settings, the evidence from Angseri and Tegaljadi shows that rural gastronomy is often sustained through quiet, informal, and everyday forms of creativity.

In Angseri, this dynamic is particularly visible through the use of indigenous ingredients such as kecombrang, rebung, and paku. These ingredients are deeply embedded in domestic cooking, ceremonial practices, and local ecological knowledge, yet they remain weakly represented within formal tourism offerings. Their limited visibility does not indicate a lack of culinary resources. Rather, it reflects how local food is often classified as “home food” rather than “tourist food.” This symbolic distinction resonates with Richards’ (2015) critique of how authenticity in food tourism is often curated, commodified, and selectively represented. In the case of Angseri, ingredients that are culturally meaningful within household and ritual contexts are sometimes considered too ordinary for tourism presentation, even though they hold strong potential as markers of place-based gastronomy.

Tegaljadi presents a different but complementary configuration of rural gastronomy. While Angseri’s culinary identity is strongly connected to indigenous ingredients and agricultural landscapes, Tegaljadi demonstrates a more established tradition of household-based snack production. Products such as keripik bayam, keripik singkong, keripik ubi, keripik kacang ijo, kaliadrem, and jaje reta are regularly produced for daily consumption, ritual purposes, and small-scale local sales. However, despite their cultural significance and productive continuity, these foods remain largely confined to local markets and have not been fully repositioned as tourism narratives or gastronomic experiences. This suggests that even when food production is already active and economically present, it may still remain disconnected from broader tourism value chains.

Taken together, Angseri and Tegaljadi illustrate two complementary expressions of rural gastronomy. Angseri reflects an ingredient-based culinary heritage that remains underutilised within tourism development, while Tegaljadi reflects a household snack economy that is culturally active but weakly integrated into destination narratives. Both cases show that rural culinary resources are not absent; rather, they are insufficiently translated into recognised tourism assets. This finding supports sustainable gastronomy scholarship which argues that food should not be understood merely as a consumable attraction, but as part of a wider system involving culture, ecology, community livelihoods, and social relations (Malinowska et al., 2024; Nyberg et al., 2022; Reynolds, 2020).

The findings further suggest that culinary innovation in both villages is incremental rather than disruptive. In Angseri, innovation appears through attempts to transform local ingredients into herbal teas, sambal, fermented condiments, and wellness-related products. In Tegaljadi, innovation occurs more subtly through adjustments in seasoning, frying techniques, packaging, and recipe refinement within existing snack traditions. These practices may not always be labelled as “innovation” by the producers themselves.

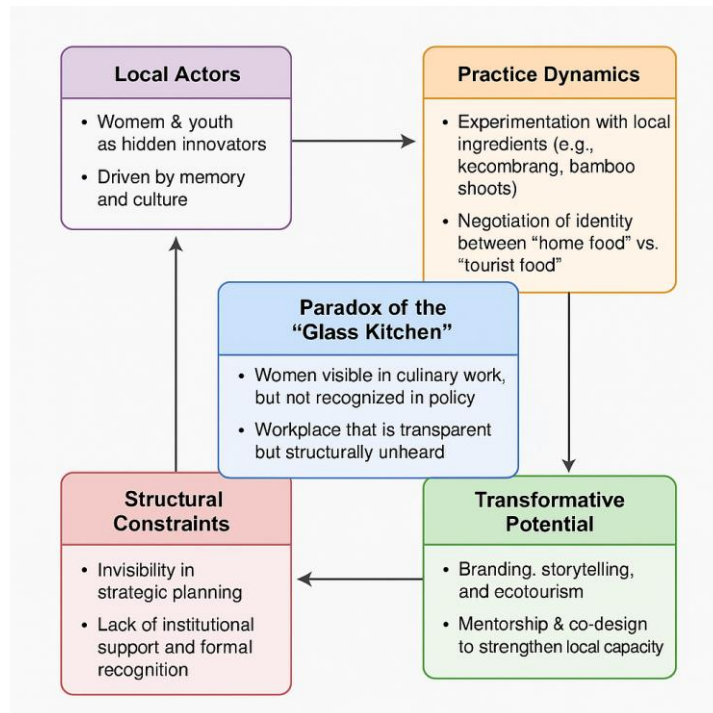
However, they reflect what Guiné et al. (2021) describe as the dynamic relationship between tradition and food development, where culinary continuity does not prevent adaptation but often becomes the basis for it. From the perspective of sustainable gastronomy, these adaptations represent important forms of grassroots creativity because they show how rural communities respond to changing tastes, tourism encounters, and economic opportunities while remaining anchored in familiar food practices.

This is where the negotiation of culinary identity becomes significant. In both villages, local actors are beginning to reinterpret what counts as valuable, authentic, or tourism-ready food. Older participants tend to associate culinary identity with ritual use, ancestral memory, traditional preparation, and ecological meaning. Younger actors, by contrast, are more likely to recognise the potential of packaging, storytelling, hygiene, portability, and visual presentation. This does not necessarily indicate a conflict between tradition and modernity. Rather, it reflects an ongoing negotiation between continuity and adaptation. Rural culinary identity is not static; it is continuously reworked as communities encounter new expectations, market opportunities, and tourism imaginaries.

However, this negotiation also carries certain risks. When local food is reframed primarily through tourism aesthetics, its deeper social and cultural meanings may be simplified. A sambal, a traditional snack, or a herbal drink can easily become a marketable product, but the labour, memory, ecological knowledge, and gendered practices behind it may remain invisible. This issue is particularly important in Angseri and Tegaljadi, where much of the culinary work is carried out by women in domestic or semi-informal spaces. Tourism may create new opportunities for visibility, but it can also reproduce older patterns of exclusion if women's roles remain limited to production while strategic decisions concerning branding, product development, and tourism planning are controlled by others.

A central contribution of this study is therefore the concept of the "glass kitchen." The metaphor captures a paradox found across both villages: women's culinary labour is highly visible in everyday life, yet structurally invisible within tourism governance and economic recognition. Women prepare food, manage ingredients, transmit recipes, adjust products, and sustain ritual and household food systems. Yet their contributions rarely translate into leadership roles, formal recognition, or participation in tourism planning. This dynamic reflects broader patterns identified in feminist rural development and tourism scholarship, where women's labour sustains local economies while remaining structurally undervalued (Adnyani, 2023; Ernawati et al., 2022; García-Henche et al., 2024; Lang & Fink, 2019; Shantika et al., 2021).

The glass kitchen framework is useful because it does not merely describe women's participation; it explains the gap between participation and recognition. Women are present in the culinary system, but their presence does not automatically produce influence. Their work is visible at the level of practice, but less visible at the level of policy, branding, product development, and institutional decision-making. In Angseri, this invisibility appears in the under-recognition of women's knowledge of indigenous ingredients. In Tegaljadi, it appears in the way women's snack production is often treated as routine household work rather than as a meaningful part of the village's gastronomic identity. This distinction is important because inclusion in rural tourism cannot be measured only by whether women are involved in food production. It must also consider whether women have the authority to define culinary narratives, access development support, shape tourism products, and benefit from the value created by their labour.



(Source: Author’s elaboration based on field data, adapted and further developed from the preliminary conceptual model presented in Kartini et al. (2025))

Figure 1. The Glass Kitchen Model of Informal Culinary Innovation

Figure 1 illustrates this conceptual framework by positioning everyday culinary practices, local actors, and structural constraints within a broader system of informal culinary innovation. The model shows how grassroots creativity emerges through experimentation with ingredients, storytelling practices, recipe adaptation, and small-scale product development, often initiated by women and youth. At the same time, it highlights how structural barriers—such as limited access to branding platforms, mentorship, institutional support, and tourism decision-making spaces—prevent these initiatives from becoming visible and recognised tourism products. The model therefore connects the empirical findings from Angseri and Tegaljadi with the wider conceptual argument of this study: that sustainable rural gastronomy depends not only on culinary resources, but also on the social structures that determine whose knowledge becomes visible, valuable, and institutionally supported.

The implications of this research extend beyond the two villages. Similar patterns of gendered culinary labour, underutilised food heritage, and informal innovation are likely to be found in many rural tourism destinations across the Global South. The glass kitchen framework therefore offers a diagnostic tool for identifying exclusionary dynamics in tourism development while also suggesting pathways toward more inclusive strategies. Sustainable gastronomy development requires more than promoting local food as an attraction. It requires institutional mechanisms that connect everyday culinary knowledge with tourism planning in ways that are participatory and context-sensitive. These mechanisms may include cooperative production spaces, women-led culinary forums, mentorship for packaging and storytelling, village-level culinary mapping, and participatory product development involving both older knowledge holders and younger entrepreneurs.

Ultimately, the cases of Angseri and Tegaljadi show that the future of rural gastronomy depends not only on what food is available, but also on whose knowledge is recognised and whose labour is allowed to shape tourism development. By repositioning everyday culinary actors, particularly women, as agents of innovation rather than merely as supporting labour, rural tourism can move toward a more inclusive model of sustainable gastronomy. In this model, food is not treated simply as a product for visitors, but as a living cultural practice through which heritage, livelihood, gender relations, and local creativity are continuously negotiated.

Conclusions

This study shows that sustainable gastronomy in rural tourism is sustained not only through formal enterprises, destination branding, or tourism infrastructure, but also through everyday culinary practices embedded in household routines, local ingredients, ritual obligations, and gendered knowledge. Evidence from Angseri and Tegaljadi demonstrates that culinary innovation often emerges informally through domestic experimentation, recipe adaptation, small-scale snack production, and the creative use of indigenous ingredients. These practices are central to rural food systems, yet they remain only partially recognised within tourism narratives and value chains.

The main conceptual contribution of this study lies in the introduction of the “glass kitchen” as a lens for understanding the paradox of women’s culinary labour in rural tourism. Women are highly visible in food preparation, ingredient management, culinary transmission, and informal innovation, yet their contributions often remain structurally invisible within tourism governance, product development, and institutional decision-making. This concept helps explain why rural culinary knowledge may be culturally present but economically and politically under-recognised.

The findings suggest that inclusive rural tourism development requires more than promoting local food as an attraction. It requires institutional support for the people and practices behind the food, particularly women whose everyday labour sustains local gastronomy. Practical strategies may include women-led culinary forums, cooperative production spaces, culinary mapping, mentorship in packaging and storytelling, and participatory product development that connects older knowledge holders with younger entrepreneurs.

By repositioning everyday culinary actors as agents of innovation rather than merely as supporting labour, rural tourism can move toward a more inclusive and culturally grounded model of sustainable gastronomy. In this sense, the future of rural gastronomy depends not only on preserving food heritage, but also on recognising whose labour, knowledge, and creativity are allowed to shape its development.

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From Green Marketing to Loyalty: Analyzing Generation Z Dining Experience at Paon Nirwana Restaurant, Jembrana, Bali

Ida Bagus Nyoman Krisna Prawira Yuda^{1*}, Febrianus Jaya², Susanti Bole³, Adrianus Pukur⁴, Hendrisensia Eken⁵

^{1,2,3,4,5}Tourism Study Program, Universitas Triatma Mulya, Indonesia

*Corresponding Author: prawira.yuda@triatmamulya.ac.id

Abstract: The rapid growth of Bali's tourism industry necessitates innovative and sustainable culinary approaches, with “green dining” emerging as a key trend, particularly appealing to environmentally conscious Generation Z. However, a limited understanding of sustainability-based branding strategies among restaurant employees presents a challenge. This study aims to analyze the implementation of the green marketing mix (4Ps), explore the green dining experience, and examine the formation of customer loyalty at Paon Nirwana Restaurant. This study employed a phenomenological qualitative approach involving five purposively selected informants. Data were collected using semi-structured interviews, participatory observation, and documentation. The findings reveal that Paon Nirwana effectively implements comprehensive green marketing strategies, including paper takeaway boxes, QR code menus, local suppliers, and eco-friendly design. Generation Z highly values the restaurant's open concept, natural surroundings, and non-smoking environment, leading to positive dining experiences and minimal food waste. Customers actively share positive online reviews, which significantly contribute to customer retention. In practice, these findings confirm that value-based, affordable green strategies can be a competitive advantage for restaurants in developing destinations and support the implementation of green tourism without charging premium prices.

Keywords: Customer Loyalty, Generation Z, Green Dining, Green Marketing Mix

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Introduction

The rapid expansion of Bali's tourism sector is driving culinary enterprises toward greater innovation and sustainability, with green dining emerging as a prominent trend within the island's restaurant industry. Corte et al. (2025) identify the green dining concept as encompassing multiple operational dimensions: eliminating single-use plastics, optimizing energy and water efficiency in food processing, sourcing organic ingredients from local suppliers, and implementing efficient waste management. These practices contribute to a positive brand image and enhanced customer loyalty, fostering greater satisfaction and trust through an improved dining experience (Al-Ansi & Han, 2019).

The Indonesian Millennial Gen Z Report projects that by 2025, 55% of Generation Z will be utilizing environmentally friendly products. This high level of adoption holds considerable potential to stimulate transformative changes in consumption behaviour, thereby directly influencing environmental outcomes (Pasaman & Hutaaruk, 2025). This finding indicates a strong potential shift among Generation Z toward environmentally friendly consumption. In addition, Shishan et al. (2021) revealed psychological and demographic components of restaurant diners' intentions, contributing to a deeper understanding of decision-making processes in sustainable restaurant contexts. Similar

findings by Lau et al. (2025) suggest that promoting environmentally friendly fast-food options reduces food waste while maintaining social image.

Paon Nirwana Restaurant, located within the Nirwana Garden Bali complex in Sawe Village, Jembrana Regency, West Bali, approximately 93 kilometers northwest of Denpasar, is a pioneer in eco-friendly and sustainable concepts, including using more environmentally friendly materials, reducing the use of single-use plastics, offering an open-air restaurant with a natural feel, and implementing recycling initiatives. However, a key challenge is promoting plant-based dining in Jembrana Regency, where many Generation Z consumers still prefer animal-based options. Therefore, consumer education is needed about the importance of environmental sustainability and the benefits of environmentally friendly products (Luckyardi et al., 2022).

Although research on green restaurants has grown in recent years, most studies primarily examine operational sustainability practices such as waste management, energy efficiency, and the conversion of food waste into organic liquid fertilizer, particularly in the context of mass tourism or urban areas (Veronica et al., 2025). Limited attention has been paid to how plant-based restaurants strategically integrate the green marketing mix (4Ps) to build experiential value and foster customer loyalty, particularly in emerging tourism destinations rather than mass tourism destinations. Therefore, it remains unclear how a sustainability-oriented restaurant model, as an integrated branding strategy, can generate long-term competitive advantage in emerging destinations such as Jembrana Regency. Accordingly, this study is designed to answer the following research questions:

1. How is the green marketing mix (4Ps) implemented in a plant-based restaurant context at Paon Nirwana, West Bali?
2. How do Generation Z customers perceive and experience green dining within this emerging sustainability-oriented restaurant setting?
3. How do green dining practices influence customer loyalty and retention in a regional tourism destination such as Jembrana Regency?

This study, therefore, aims to analyze the implementation of Paon Nirwana's green marketing mix, characterize patrons' green dining experiences, and assess post-visit customer loyalty dynamics. This research contributes to green tourism scholarship by elucidating the interplay between plant-based culinary models, experiential branding, and consumer loyalty. Findings may inform sustainability strategies for restaurants in Jembrana Regency and comparable contexts where green dining remains underutilized as a competitive differentiator.

Methodology

This study adopts a phenomenological approach that focuses on the lived experiences of both management and customers regarding sustainable practices as a green restaurant branding strategy to examine the development of green dining practices and their implications for the experiential dimensions of dining (Subadra, 2019; Flick, 2014). Through in-depth interviews, the research explored participants' perceptions, motivations, and practices related to green branding and sustainable dining. The interview guide encompassed key thematic areas, including the implementation of sustainability practices, challenges encountered in maintaining green operations, customer engagement strategies, and the role of green branding in shaping dining experiences. Management informants, for instance, were asked to elaborate on how sustainability principles were integrated into daily restaurant operations and to identify the challenges faced in maintaining consistent green practices. Conversely, customer informants were prompted to reflect on which aspects of the restaurant's sustainability

efforts influenced their dining experience and how the establishment's green branding affected their decision to dine there.

Informants were selected through purposive sampling based on three criteria: (1) a minimum of one year of experience at the restaurant; (2) a demonstrated understanding of the green dining concept; and (3) knowledge of marketing and operational strategies. Applying these criteria, the study comprised three key management informants, including the Restaurant Manager, one marketing staff member, and one Restaurant Supervisor, as well as two Generation Z customers, aged 19 and 21, who were visiting at the time of data collection and consented to share their dining experiences. Applying these criteria, the study comprised three key management informants, including the Restaurant Manager, one marketing staff member, and one Restaurant Supervisor, as well as two Generation Z customers, aged 19 and 21, who were visiting at the time of data collection and consented to share their dining experiences.

Data collection was conducted on May 29–30, 2025, through semi-structured interviews, limited participatory observation, and documentation studies. The interviews lasted approximately 90 minutes and were guided by prepared questions covering the concept of the green marketing mix (4Ps), the dimensions of the green dining experience, and the strategy for customer retention. The observation was conducted during restaurant operating hours, covering the menu on the QR code, waste management, staff and customer interactions, and the restaurant's environment. Documentation data were obtained from customer comments on social media platforms and Google Reviews. The main instrument in this study was the researcher himself (human instrument), supported by interview guidelines and observation sheets based on green marketing indicators.

Data analysis was conducted inductively through several systematic stages (Subadra, 2025; Patton, 2014). Data analysis was conducted inductively through several systematic stages (Subadra, 2025; Patton, 2014). First, data transcription and organization were performed to ensure accuracy and familiarity with the material. Second, coding was conducted to identify key themes; this process involved systematically labeling text segments that captured meaningful units of information. More specifically, a management informant's explanation of sourcing ingredients from local farmers to reduce carbon footprint was coded as "sustainable supply chain". In contrast, a Generation Z customer's remark that "the eco-friendly packaging makes me feel good about eating here" was coded as "green brand image perception." Third, the identified codes were grouped into broader thematic categories aligned with the 4Ps of marketing, dining experience, and customer loyalty. Data validity was ensured through triangulation of interviews, observations, and documentation, as well as member checking with key informants.

Results & discussions

Implementation of Green Marketing Mix (Green Tourism Marketing) at Paon Nirwana Restaurant

The results of the study show that Paon Nirwana Restaurant has implemented a green marketing mix across product, price, place, and promotion strategies grounded in sustainability principles.

In terms of green products, Paon Nirwana Restaurant contributes to environmental sustainability by saving energy, recycling waste, and reducing plastic usage. For example, replacing paper menus in restaurants with digital menus that use QR codes is

expected to reduce paper waste, use takeaway boxes made from premium paper (figure 1), source raw materials from local suppliers, and improve electricity and water efficiency. The restaurant manager claimed:

"At Paon Nirwana Restaurant, we try to ensure that our daily operations are environmentally responsible. We have introduced digital menus via QR codes to reduce paper use, chosen paper-based takeaway packaging over plastic, and prioritised ingredients from local producers. At the same time, we continuously monitor electricity and water consumption because sustainability should become part of our service culture without affecting the quality experienced by guests."
(Restaurant Manager, 20/10/25)

The manager's statement indicates that environmental sustainability at Paon Nirwana Restaurant is not treated as a symbolic commitment but is integrated into everyday operational practices through concrete managerial decisions. The adoption of digital menus, paper-based takeaway packaging, and locally sourced ingredients reflects a deliberate effort to reduce waste, minimise dependence on plastic, and shorten supply chains, thereby lowering the restaurant's environmental footprint. These practices also suggest that sustainability is approached as part of service innovation, where ecological responsibility is aligned with maintaining customer convenience and food quality. Furthermore, the emphasis on monitoring electricity and water consumption demonstrates managerial awareness that resource efficiency is an important component of operational sustainability in food and beverage services. Analytically, this finding shows that green restaurant practices are implemented through both technological adaptation and behavioural management, indicating that sustainability is embedded not only in products but also in the broader operational culture of the restaurant. (Kanca, 2024) supports these findings, noting that green actions in food and beverage operations include minimizing electricity and water usage, prioritizing organic products, and sourcing ingredients from local producers.



(Source: Nirwana Garden Bali Restaurant, 2025)

Figure 1. Take Away Box using paper materials

In terms of green place, the restaurant's open-concept interior design, which emphasizes natural elements and good ventilation, creates a comfortable and educational atmosphere. The exterior design, featuring gardens, organic gardens, and natural materials, creates a healthy and environmentally friendly impression. Paon Nirwana operates as a non-smoking restaurant, reinforcing its positioning as a sustainability-oriented establishment. A visitor reviewed:

"Very beautiful place, friendly staff, delicious food, and beautiful views. The restaurant is very well maintained, thank you very much!" (Visitor Review, 30/09/25).

The visitor review reflects a holistic appreciation of the restaurant's green place strategy, in which the physical environment, service quality, and operational consistency converge to shape a positive dining experience. The reviewer's emphasis on the "beautiful place" and "beautiful views" suggests that the open-concept design and integration with natural surroundings successfully evoke aesthetic pleasure and sensory comfort served as key dimensions of experiential dining. The mention of "friendly staff" further indicates that the green place strategy extends beyond physical infrastructure to encompass hospitality practices aligned with sustainability values, reinforcing the restaurant's brand identity through interpersonal engagement. Moreover, the remark that the restaurant is "very well maintained" implies a perception of operational integrity and attention to detail, both of which are critical to sustaining credibility in green branding. Together, these elements illustrate how the restaurant's commitment to sustainability is not merely symbolic but is tangibly experienced by customers, thereby strengthening the alignment between green place attributes and customer satisfaction. The review thus exemplifies the role of the physical environment as both a functional space and a communicative medium through which the restaurant conveys its sustainability ethos and cultivates customer loyalty.

Ajzen's (1991) theory of planned behavior posits that attitudes, shaped by environmental cues, serve as antecedents to behavioral intentions. In the context of green dining, this suggests that the physical environment of a restaurant functions not merely as a backdrop but as a critical mechanism through which sustainability values are communicated and internalized by customers. Complementing this, Almaz and Suryawardani (2025) found that Generation Z consumers are particularly attuned to visual design, emotional resonance, and the overall experiential quality of restaurant environments. This generational sensitivity implies that for younger consumers, the alignment between a restaurant's spatial aesthetics and its sustainability claims significantly influences their perception of authenticity. Consequently, the integration of natural design elements, such as open-concept layouts and organic gardens, does not merely project a "healthy and environmentally friendly" image; it actively creates an immersive experience that aligns with the values and expectations of this demographic. In doing so, the restaurant transforms its physical space into a medium of persuasion, reinforcing positive attitudes that are likely to translate into repeat patronage and brand advocacy.



(Source: Nirwana Garden Bali Restaurant, 2025)

Figure 2. Paon Nirwana Restaurant with an Open Concept Atmosphere

Paon Nirwana Restaurant adopts a value-based pricing strategy that prioritizes affordability, exemplified by menu items such as vegetarian fried rice priced at IDR 20,000. While green pricing is conventionally understood as a strategy that allows customers to pay a premium in exchange for environmentally responsible value (Holt & Holt, 2004), this restaurant deviates from that pattern. Rather than leveraging its sustainability credentials to command higher prices, Paon Nirwana deliberately positions itself as an accessible sustainable dining option, thereby broadening the reach of eco-conscious consumption, particularly among price-sensitive segments.

This approach aligns with findings that when environmentally friendly services gain popularity, even in the absence of strong environmental motivations, consumer preference may enable restaurants to increase prices (Zhang et al., 2025; T. M. et al., 2021). However, Paon Nirwana's strategy illustrates an alternative pathway: maintaining low prices to reinforce its identity as a genuinely inclusive, sustainable establishment. In the context of Generation Z consumers, which is a demographic shown to prioritize sustainable food consumption (Lopes et al., 2024). This pricing model not only supports accessibility but also strengthens brand authenticity, as it signals a commitment to sustainability that is not contingent on extracting premium value from environmentally conscious customers. The restaurant manager and customer stated:

"We do not want sustainability to make our food exclusive or expensive. Even though we apply environmentally responsible practices, our principle is that everyone should still be able to enjoy affordable meals here. That is why menu items such as vegetarian fried rice remain reasonably priced, because sustainability should be accessible to all customers, not only to those who can pay more." (Restaurant Manager, 20/10/25)

"I appreciate that eating at Paon Nirwana Restaurant is affordable while still reflecting environmental awareness. Usually, places that promote eco-friendly concepts charge more, but here the price feels fair, and it makes me feel that sustainability is part of the restaurant's genuine values rather than just a marketing strategy." (Customer, 02/11/25)

The perspectives of the restaurant manager and a customer together illuminate a distinctive approach to green pricing that challenges conventional assumptions in sustainable business models. The manager's assertion that "sustainability should be accessible to all customers" reflects a deliberate strategic positioning wherein environmental responsibility is decoupled from premium pricing. This stance diverges from the prevailing logic that positions sustainability as a value-added feature warranting higher prices (Holt & Holt, 2004). Instead, Paon Nirwana Restaurant adopts an inclusive value-based strategy that treats affordability as integral to its sustainability ethos, suggesting that accessibility itself becomes a dimension of responsible practice.

The customer's observation reinforces the effectiveness of this strategy, noting that the restaurant's prices "feel fair" and that sustainability is perceived as "genuine values rather than just a marketing strategy." This distinction is critical. Research indicates that consumers, particularly younger demographics such as Generation Z, are increasingly adept at discerning authentic commitment from performative branding (Lopes et al., 2024). When a restaurant's pricing aligns with its professed values of charging affordably despite investing in sustainable operations, it signals consistency that enhances credibility. In contrast, businesses that impose green premiums without

a transparent justification risk being perceived as engaging in “greenwashing,” in which environmental claims serve primarily as marketing devices.

In terms of green promotion, Paon Nirwana Restaurant employs a two-channel strategy to support its sustainability mission. Initially, the restaurant promoted its products through brochures distributed to hotels, villas, schools, and government offices. At present, promotion is carried out daily through social media by posting restaurant activities (interview with marketing staff, 2025). This approach is consistent with Miller (1999), who argues that green promotion in restaurants should emphasise product advantages and their benefits for both consumers and the environment. The restaurant also uses algorithmically optimised content on Facebook, Instagram, and TikTok to highlight its eco-friendly practices and plant-based menu, thereby strengthening the visibility of its sustainable identity. The restaurant manager argued:

"Our promotion is not only intended to introduce the menu, but also to communicate the values behind the restaurant. In the past, we relied on brochures distributed to hotels, villas, schools, and government offices, whereas today we consistently use social media every day to share restaurant activities, environmentally friendly practices, and our plant-based menu. Through platforms such as Facebook, Instagram, and TikTok, we want customers to understand that dining here means supporting a healthier lifestyle and environmental responsibility at the same time." (Restaurant Manager, 20/10/25)

The manager's statement demonstrates that green promotion at Paon Nirwana Restaurant serves not merely as a communication tool for product visibility but also as a strategic medium for value transmission, in which sustainability is embedded in the restaurant's brand narrative. The transition from conventional brochure distribution to daily digital engagement signals an adaptive shift in promotional approach from static information delivery to interactive, continuous relationship-building with consumers. By using Facebook, Instagram, and TikTok, the restaurant is not only expanding market reach but also constructing a symbolic association between food consumption, healthy living, and environmental responsibility. This suggests that green promotion operates as a form of identity positioning in which sustainability becomes part of the restaurant's experiential appeal rather than a separate environmental claim. The consistent display of eco-friendly practices and plant-based offerings also reflects how digital promotion can shape consumer perceptions by translating operational sustainability into visible and relatable content, thereby reinforcing credibility and encouraging environmentally conscious consumption in a highly competitive food service market.

Dining Experience

Findings reveal that dining atmosphere constitutes a primary determinant of visit intention among Generation Z consumers, a demographic distinguished by heightened environmental consciousness and value-driven consumption patterns. This cohort demonstrates a pronounced preference for restaurants that operationalize sustainability through tangible practices, including comprehensive recycling systems, the use of wooden cutlery, the elimination of single-use plastics, premium paper-based takeaway packaging, systematic food waste reduction, open-plan architectural designs, and smoke-free environments (Subadra, 2024). For Generation Z, a genuinely sustainable atmosphere functions not as an ancillary amenity but as a non-negotiable criterion in restaurant selection, reflecting a fundamental shift in consumer expectations wherein environmental responsibility is integrated into core evaluative standards rather than treated as an optional enhancement.

This consumer orientation is corroborated by management perspectives, which affirm that atmosphere is understood as the synthesis of aesthetic appeal, physical comfort, and perceived value remains central to attracting younger patrons (Interview with Restaurant Manager, 2025). Strategically, Paon Nirwana Restaurant operationalizes the traditional 4Ps marketing framework (Product, Price, Place, Promotion) through a sustainability lens, reinterpreting each element to align with the values of environmentally conscious consumers. For instance, product strategy emphasizes plant-based menu offerings, while place strategy leverages the synergy between the restaurant's location and its ecological ethos. This approach demonstrates that competitive positioning in the green dining sector is not contingent on expanding the theoretical scope of marketing frameworks, but rather on achieving focused, coherent alignment with sustainability values across all operational dimensions. Such alignment enables the restaurant to translate its environmental commitments into a cohesive brand identity that resonates authentically with Generation Z consumers' expectations.

Building Customer Loyalty and Retention Through Sustainable Practices

Customer reviews on Google indicate that the sustainability practices at Paon Nirwana Restaurant directly contribute to customer satisfaction and advocacy. Visitors consistently highlight the restaurant's well-maintained environment, scenic views, friendly staff, and food quality, suggesting that environmental stewardship enhances overall service perception. These testimonials align with the service quality framework (Parasuraman et al., 1988), which posits that tangible cues, such as physical facilities and employee behaviors, significantly shape customers' evaluations of service encounters. By embedding eco-friendly practices into these tangible elements, the restaurant not only meets functional expectations but also enhances experiential value, a finding consistent with research on green hospitality, in which environmental initiatives positively influence perceived quality and satisfaction (Han et al., 2018; Kim & Han, 2010).

Furthermore, such positive evaluations translate into behavioral loyalty, as evidenced by the spontaneous electronic word-of-mouth (eWOM) expressed in online reviews. According to Hennig-Thurau et al. (2004), eWOM is a powerful outcome of customer satisfaction, particularly when consumers perceive a brand's values as authentic. In this case, the consistency between the restaurant's environmental claims and its operational practices appears to generate trust-based advocacy, supporting Han and Yoon's (2015) behavioral loyalty model, which emphasizes that trust and perceived value are key antecedents of revisit intention and positive referrals.

The Restaurant Supervisor noted that the green concept appeals across generations, including families and younger consumers, although preferences may vary (Interview with Restaurant Supervisor, 2025). This observation resonates with studies showing that while all age groups appreciate sustainability, Generation Z exhibits heightened sensitivity to visual design and experiential quality (Almaz & Suryawardani, 2025; Lopes et al., 2024). Despite such generational variation, revisit intention remains strong, indicating that sustainability serves as a cross-demographic driver of loyalty. Collectively, these findings suggest that integrating sensory appeal, service quality, and ethical value, as articulated in Parasuraman et al.'s (1988) SERVQUAL dimensions and extended in green consumer behavior models, creates a multidimensional value proposition. Online reviews thus serve as concrete validation that green dining practices generate sustained customer loyalty through a combination of experiential satisfaction and value congruence.

Conclusions

This study demonstrates that the strategic implementation of the green marketing mix (4Ps) at Paon Nirwana Restaurant effectively enhances green dining experiences and strengthens customer loyalty, particularly among Generation Z consumers. The restaurant operationalizes its sustainability commitment through tangible practices across each marketing element. Regarding the product, the menu emphasizes plant-based offerings and utilizes locally sourced ingredients to reduce the carbon footprint. In terms of price, the restaurant adopts a value-based strategy that maintains affordability, deliberately positioning sustainability as accessible rather than exclusive. For place, the restaurant features an open-concept natural design with organic gardens, good ventilation, and a non-smoking policy, creating an atmosphere that communicates environmental stewardship through spatial experience. For promotion, digital menus accessed via QR codes reduce paper waste, while social media content on platforms such as Instagram and TikTok highlights the restaurant's eco-friendly practices.

While these green marketing practices appeal broadly, the findings reveal a distinct generational distinction in how value is perceived. For Generation Z consumers, characterized by heightened environmental awareness and value-driven consumption, a commitment to waste reduction and an authentic, environmentally friendly atmosphere functions as a non-negotiable criterion rather than a complementary attribute. Unlike older demographics who may prioritize convenience or price above sustainability, Generation Z evaluates the sincerity of environmental claims and responds positively when restaurants demonstrate operational consistency between stated values and actual practices. This cohort is particularly attuned to the absence of greenwashing; when sustainability is embedded visibly and affordably, as exemplified by Paon Nirwana, it generates not only visit intention but also positive electronic word-of-mouth and revisit behavior.

The significance of this study lies in its demonstration that sustainability strategies can serve as a competitive advantage for restaurants in developing destinations without necessitating premium pricing. These findings challenge conventional assumptions in the green marketing literature, which often position sustainability as a value-added feature warranting higher prices (Holt & Holt, 2004; Zhang et al., 2025). By illustrating an alternative model wherein affordability and environmental responsibility are integrated, the study offers practical insights for restaurant operators seeking to appeal to environmentally conscious consumers while maintaining accessibility. Furthermore, the focus on Generation Z provides empirical grounding for understanding how this demographic's unique value system shapes their evaluation of green dining experiences, extending existing research on generational differences in sustainable consumption (Almaz & Suryawardani, 2025; Lopes et al., 2024).

Despite these contributions, this study is subject to several limitations. The interview stage did not include representatives from the Jembrana Regency government, whose perspectives on policy support for green tourism initiatives could offer valuable contextual insight. Additionally, restaurant staff demonstrated limited understanding of the green marketing mix as a strategic framework, suggesting that internal capacity-building may be necessary to fully realize the potential of sustainability positioning. Moreover, promotional content on Instagram and TikTok remains underutilized in educating the broader public, particularly within Jembrana Regency, where awareness of green dining concepts may still be developing. Future research is recommended to extend the analytical scope from the 4Ps to the 7Ps marketing framework, incorporating elements such as people, process, and physical evidence to capture the full complexity of green service delivery. Longitudinal studies examining how generational perceptions

evolve over time, as well as comparative analyses across different geographical and cultural contexts, would further enrich understanding of sustainable branding in the hospitality sector.

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Rebranding Bali's Hospitality Industry Through Green Marketing: Can Brand Awareness Strengthen Brand Image?

Gratika Eka Wati^{1*}, Teofilus²

^{1,2}School of Business and Management, Universitas Ciputra Surabaya, Indonesia

*Corresponding Author: gekawatio1@magister.ciputra.ac.id

Abstract: Bali's hospitality industry is facing increasing tension between rapid tourism growth and mounting environmental pressure, which may weaken the destination's sustainable positioning. In this context, green marketing plays an important strategic role by integrating environmental considerations into product, price, place, and promotion. When sustainability signals are visible, credible, and consistent, green marketing can support hospitality rebranding while reducing the risk of greenwashing perceptions. This study examines the effect of green marketing on brand awareness and brand image, and tests the mediating role of brand awareness through the lens of Signaling Theory, where green marketing functions as the signal, brand awareness reflects signal reception, and brand image represents the cognitive outcome. A quantitative survey was conducted with 144 guests who had stayed between February 2025 and January 2026 at Ini Vie Hospitality villas or resorts in Bali holding Eco Climate Badge Gold or Silver certification from Eco Tourism Bali. The data were analyzed using PLS-SEM. The findings reveal that green marketing has a positive and significant effect on brand awareness ($\beta = 0.764$, $p < 0.001$) and brand image ($\beta = 0.520$, $p < 0.001$), while brand awareness also positively influences brand image ($\beta = 0.411$, $p < 0.001$). In addition, brand awareness significantly mediates the relationship between green marketing and brand image. These findings show that credible and verifiable sustainability signals can strengthen brand image through stronger brand awareness, while also offering practical guidance for hospitality managers in aligning environmental practices with consistent communication across guest touchpoints.

Keywords: Bali, brand awareness, brand image, green marketing, hospitality

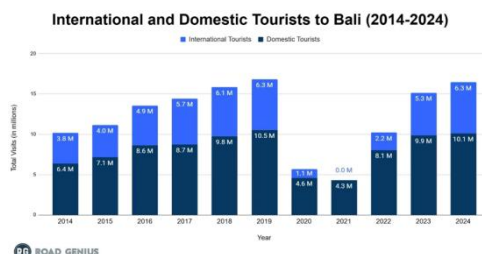
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Introduction

The hospitality industry in Bali is currently at a critical juncture, following the rapid recovery of tourism, which has reinstated the sector as a key driver of the regional economy, particularly through accommodation and food and beverage services. In 2024, Bali recorded approximately 16.45 million tourist arrivals, comprising 6.33 million international visitors and 10.12 million domestic travelers. This figure reflects a 7.9% increase compared to the preceding year (Bali Provincial Statistics Agency, 2025). This upward trend is also reflected at the firm level. Ini Vie Hospitality, a hospitality management company operating more than 40 villa and resort properties in Bali, reported an estimated average annual growth of 25% to 28% between 2022 and 2025, supported by the continued expansion of its managed properties. This development was particularly visible in key tourism areas such as Ubud, Seminyak, and Canggu. At the time of data collection, 13 of the company's properties had been certified under the Eco Climate Badge Gold and Silver categories, which formed the basis of this study. These properties recorded an average occupancy rate of approximately 91.5% during January to November 2025, indicating strong guest demand and increasing operational intensity. Such conditions not only reinforce the sector's economic significance but also imply

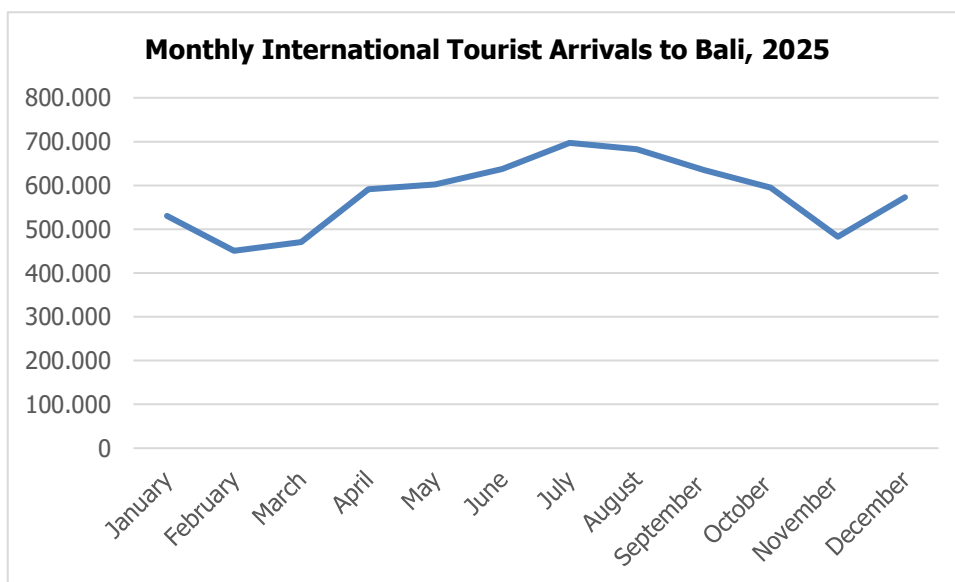
greater resource consumption and heightened environmental pressure at the operational level. This condition reflects a critical paradox in Bali’s hospitality industry, where rapid tourism growth is accompanied by increasing environmental pressure and inconsistent sustainability performance.



(Source: Statistics Indonesia BPS Bali Province, 2025)

Figure 1. Growth of International and Domestic Tourists in Bali, 2014–2024

Monthly international tourist arrivals throughout 2025 show a fluctuating yet generally upward trend, with arrivals rising by 8.07% from January to December, reflecting the continued recovery of Bali’s tourism sector, as presented in Figure 2.



(Source: Statistics Indonesia BPS Bali Province, 2025)

Figure 2. Monthly Trends in International Tourist Arrivals to Bali, 2025

Figure 2 illustrates that international tourist arrivals in Bali throughout 2025 followed a fluctuating yet overall increasing trend, reflecting seasonal patterns and the continued recovery of the tourism sector.

This growth coincides with increasing environmental pressures, particularly regarding water consumption and waste management, as many tourism areas place substantial resource demands on local systems and generate significant waste. The implementation of sustainability practices aligned with the local Tri Hita Karana values remains inconsistent. This situation underscores the importance of credible green marketing, in which brand awareness plays a key role in translating sustainability efforts into a strong, trustworthy brand image.

Although green marketing practices are increasingly implemented in the hospitality industry, several studies indicate a gap between the sustainability claims communicated

sustainability signals are received, remembered, and translated into stronger brand perceptions.

Previous studies have emphasized the role of green marketing in shaping consumer perceptions and enhancing brand performance, particularly in the hospitality sector. Consistent implementation of green marketing through elements such as green product, green promotion, green price, and green distribution can effectively increase consumer brand awareness. Unlike conventional marketing, which mainly focuses on customer value, market competitiveness, and sales outcomes, green marketing incorporates environmental considerations into the marketing mix and communicates a firm's ecological commitment to consumers (Alhomaied et al., 2025; Liu et al., 2025). In the hospitality sector, successful green marketing implementation can be seen in practices such as eco-certification, energy- and water-saving systems, waste-reduction programs, and transparent sustainability communication, which make sustainability claims more visible and credible to guests (Velaoras et al., 2025).

Findings by Murtiningsih and Junaedi (2025) indicate that strong communication of eco-friendly values facilitates consumer recognition and recall of the brand, thereby enhancing awareness. Furthermore, research by Juni and Kustiawan (2025) and Ledikwe (2020) demonstrates that brand awareness significantly influences brand image, as consumers can more easily form positive associations with well-known, memorable brands. Recent research in the hospitality sector indicates that the tangible implementation of green practices contributes to the development of a favorable green image and enhanced green trust, which in turn strengthens tourists' revisit intentions. These findings emphasize the critical role of consistent sustainability practices in reinforcing a positive brand image (Huyen et al., 2025). Additionally, consistently applied green marketing strategies have been shown to enhance hotel image and reinforce customer loyalty by fostering positive perceptions of the brand's commitment to sustainability (Aly, 2023). These findings highlight the pivotal importance of credible and consistently communicated green signals in enhancing brand awareness and shaping brand image, while further supporting the applicability of Signaling Theory as a theoretical lens for understanding how consumers interpret and respond to sustainability-related information (Seyfi et al., 2025).

This study aims to examine the effects of green marketing on brand awareness and brand image in Bali's hospitality industry, and to test the mediating role of brand awareness in strengthening the relationship between green marketing and brand image. The study aims to understand the extent to which consistent and credible green marketing practices through green product, green promotion, green price, and green distribution can enhance tourists' brand awareness and shape positive, strong, and distinctive brand perceptions in consumers' minds (Keller & Swaminathan, 2020). Accordingly, the research also focuses on the mechanism by which sustainability signals communicated through green marketing are perceived, remembered, and processed by tourists, ultimately generating a credible brand image that supports the hospitality industry's rebranding strategy toward sustainability. This approach also aligns with local Tri Hita Karana values by promoting harmony with the environment (*palemahan*), social responsibility and community engagement (*pawongan*), and respect for cultural and ethical balance (*parahyangan*) (Wiryanata et al., 2025), while simultaneously addressing the communication pressures and credibility challenges surrounding sustainability claims in mass tourism settings (Font et al., 2025).

While green marketing is often linked directly to brand image outcomes, less empirical work explains how tourists first notice and retain sustainability signals, especially in mass tourism destinations where information density is high. Building on

Signaling Theory and brand equity logic, this study tests brand awareness as the cognitive reception stage that translates green signals into a more stable brand image. The novelty of this study lies in integrating the green marketing concept as a sustainability signal with the mediating mechanism of brand awareness to shape brand image within Bali's hospitality industry. This relationship has not been extensively examined empirically in the context of destinations facing mass-tourism pressures and local Tri Hita Karana values. Previous studies have generally positioned green marketing as a direct predictor of brand image or loyalty without thoroughly investigating the underlying psychological mechanisms (Aly, 2023; Seyfi et al., 2025).

Given these unresolved issues, it is crucial to examine the underlying cognitive mechanisms through which sustainability signals are interpreted and transformed into meaningful brand perceptions. This study emphasizes that consistent and credible sustainability signals do not automatically form a brand image; rather, they are first processed by tourists through the stages of brand recognition and recall (brand awareness) before developing into a stable and meaningful brand perception. Additionally, the study contextualizes Signaling Theory within the Bali tourism setting, where green practices are often invisible to guests, making signal credibility crucial for mitigating perceptions of greenwashing (Seyfi et al., 2025; Marschlich & Hurtado, 2025). This approach offers both theoretical and practical contributions by highlighting that brand awareness is not merely an outcome but a mechanism that bridges green marketing efforts and a meaningful, trustworthy brand image for tourists, providing strategic guidance for hospitality management to strengthen brand positioning in the context of verifiable, consumer-valued sustainability.

Methodology

This study employed a quantitative research design, utilizing a survey method administered via online platforms and complemented by on-site data collection to recruit respondents. The questionnaire link was shared via email, and QR code access was provided at the reception desk, including during checkout. This approach was selected to examine the causal relationships among green marketing, brand awareness, and brand image, and to test the mediating role of brand awareness in shaping brand image within Bali's hospitality context. The research was conducted in Bali across 13 properties managed by Ini Vie Hospitality, a Bali-based hospitality management company operating an integrated portfolio of villas, resorts, restaurants, spas, and other lifestyle-oriented services. The company operates an integrated hospitality portfolio across Bali and formed the organizational context of the present study. At the time of data collection, the 13 properties included in this study had been verified under the Eco Climate Badge Gold and Silver categories by Eco Tourism Bali, and thus constituted the research setting. Data collection took place from January 10 to January 31, 2026.

A non-probability purposive sampling approach was used. Eligible participants were guests who had stayed at one or more of the certified Ini Vie Hospitality properties between February 2025 and January 2026. Eligibility was verified through screening questions at the beginning of the questionnaire, including the property name visited and the approximate time of stay, before respondents proceeded to the main items. Participation in this study was entirely voluntary and anonymous, with all respondents providing informed consent prior to participation.

The study population consisted of tourists who had stayed at the certified Ini Vie Hospitality properties within the past 12 months, with an estimated unique guest population of approximately 1,300 to 1,950 individuals during the research period. Based on internal operational records for the 13 verified properties, average paid occupancy

during January to November 2025 was approximately 91.5%, which informed an estimate of occupied room nights during the 14-day data collection period (Ini Vie Hospitality, 2025). Assuming an average length of stay of two to three nights, the estimated number of unique guests who could be approached during this period ranged from approximately 1,300 to 1,950 (Ini Vie Hospitality, 2025). These figures are provided as operational estimates to describe the sampling frame rather than as official population statistics. A conservative response rate of 10 to 20% was assumed, informed by industry benchmarks for email-based or online guest surveys and adjusted for more directed recruitment procedures such as check-out or after-stay prompts (Revinat, 2024). Accordingly, the realistic target sample was estimated at approximately 130 to 390 respondents (Revinat, 2024).

The study variables include green marketing (dimensions: green product, green promotion, green price, and green place/distribution), brand awareness (brand recognition, brand recall, and top-of-mind awareness), and brand image (strength, favorability, and uniqueness of brand associations). In the context of Ini Vie Hospitality, a green product refers to environmentally responsible service attributes, such as eco-friendly amenities, reduced use of single-use plastics, and locally sourced materials or ingredients where applicable. Green promotion refers to communicating sustainability initiatives through digital platforms, property messaging, and eco-label or certification displays to enhance transparency and credibility. Green price reflects the alignment between pricing and the perceived value of environmentally responsible hospitality services. Meanwhile, green place/distribution refers to operational and service-delivery practices that minimize environmental impact, including efficient resource use, waste-management systems, and increasingly low-impact, paperless guest interactions.

Data were gathered using a structured, closed-ended questionnaire, employing a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The questionnaire was developed based on previous literature and established indicators for each variable. Primary data were obtained through a Google Forms questionnaire distributed via various social media platforms, tourist communities, and property networks, complemented by on-site recruitment via QR code scanning and brief intercepts at checkout. Participation was voluntary and anonymous, preceded by informed consent. This method ensured that the data accurately reflected tourists' perceptions of green marketing practices and the brand image of certified properties.

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software. The analysis involved evaluating the outer model to assess the reliability and validity of the measurement indicators and constructs (outer loadings ≥ 0.70 , AVE ≥ 0.50 , CR ≥ 0.70 , and discriminant validity assessed via HTMT $< 0.85\text{--}0.90$), followed by examination of the inner model to test the structural relationships among variables, the coefficient of determination (R^2), and effect size (f^2). Hypotheses were tested using bootstrapping with a minimum of 5,000 subsamples at a 5% significance level ($p \leq 0.05$ or $t \geq 1.96$). The hypotheses tested included the direct paths green marketing \rightarrow brand awareness, brand awareness \rightarrow brand image, green marketing \rightarrow brand image, as well as the mediating role of brand awareness between green marketing and brand image. This approach allows for simultaneous evaluation of direct and indirect effects. All procedures, instruments, and analytical techniques were designed to ensure replicability in similar contexts with certified hospitality properties in Bali and other destinations, enabling the findings to serve as strategic guidance for management seeking to strengthen brand positioning through sustainable practices.

Results and discussions

Results

The following presents the research results, including respondent characteristics, evaluation of the measurement model, and analysis of the structural model to examine the relationships among variables using SmartPLS.

Respondent Characteristics

The study involved 144 respondents who had stayed at Ini Vie Hospitality properties within the past 12 months. Most respondents were aged between 21 and 35 years (78.5%), with primary travel purposes being leisure/holiday (62.5%) and honeymoon/couple getaway (24.3%). Most respondents had been exposed to information about green programs through electronic word-of-mouth (eWOM) (73.6%). Respondents originated from Bali (46.5%), other regions in Indonesia (18.1%), and international locations (35.4%), with visits distributed across Gold and Silver Eco Tourism Bali certified properties. Comprehensive respondent characteristics are presented in Table 1.

Table 1. Respondent Characteristics

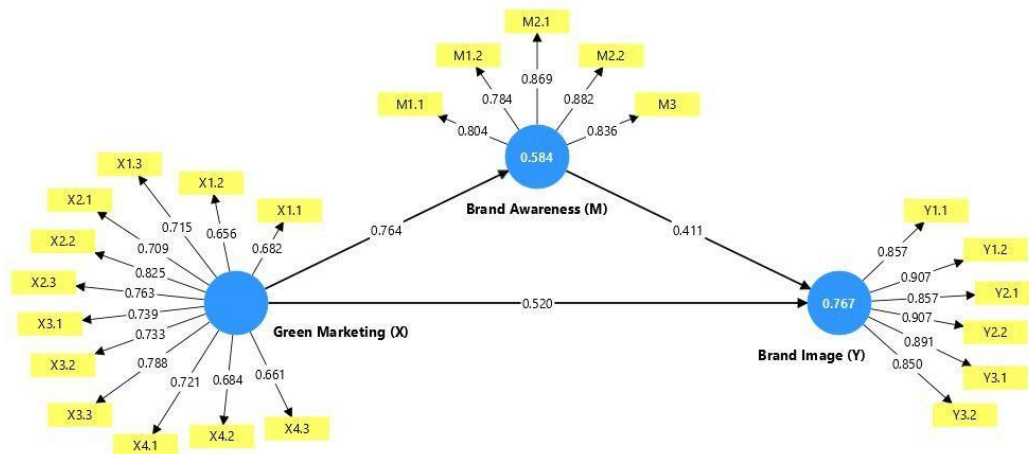
Characteristics	Category	Frequency	%
Age	21-35 years	113	78.47
	36-50 years	20	13.89
	>50 years	11	7.64
Villa or Resort Visited	Seascape Resort Uluwatu (Gold)	27	18.75
	Aksari Resort Ubud (Gold)	20	13.89
	Amarea Resort Ubud (Gold)	17	11.81
	Kaamala Resort Ubud (Gold)	15	10.42
	Sini Vie Resort Seminyak (Gold)	15	10.42
	Astera Resort Canggu (Silver)	13	9.03
	Cyrus Villa Seminyak (Silver)	13	9.03
	Asvara Villa Ubud (Silver)	13	9.03
	Monocale Resort Seminyak (Silver)	11	7.64
	Canggu Cabana Resort (Silver)	10	6.94
	Seascape Resort Sanur (Silver)	9	6.25
	Aksari Villa Seminyak (Silver)	2	1.39
	Astera Villa Seminyak (Silver)	1	0.69
Exposure to Green Program Information (eWOM)	Exposed	106	73.61
	Not Exposed	38	26.39
Domicile	Bali	67	46.53
	Outside Bali (Indonesia)	26	18.06
	Outside Indonesia	51	35.42
Purpose of Travel	Leisure/Holiday	90	62.50
	Honeymoon/Couple Getaway	35	24.31
	Business/Work	16	11.11
	Others	3	2.08

Source: Processed Data (2026)

Measurement Model (Outer Model)

The measurement model was evaluated through assessments of convergent validity, internal consistency reliability, multicollinearity, and discriminant validity. Figure

3 illustrates the measurement model (outer model), whereas Tables 3–4 present the results for outer loadings, Cronbach’s alpha, Composite Reliability (CR), AVE, VIF, and discriminant validity (HTMT). All indicators for the Brand Awareness and Brand Image constructs exhibited outer loadings above 0.708, indicating strong indicator reliability. The Green Marketing construct had several indicators with outer loadings ranging from 0.655 to 0.684, yet the AVE still met the criterion (0.525 > 0.50). Although several indicators show borderline outer loadings, they were retained because the constructs demonstrate adequate convergent validity and internal consistency. According to Hair et al. (2019), reflective indicators with outer loadings ranging from 0.40 to 0.708 may be retained provided that their removal does not result in substantial improvements in composite reliability (CR) or Average Variance Extracted (AVE), and that the indicators remain theoretically relevant in representing the construct. The values of Cronbach’s Alpha and CR exceeded the threshold of 0.70, indicating satisfactory internal consistency reliability. Furthermore, Variance Inflation Factor (VIF) values were below 5, indicating no multicollinearity. The HTMT ratios were below 0.90, thereby confirming discriminant validity. Based on these results, the measurement model was considered both valid and reliable.



(Source: Processed Data, 2026)
Figure 4. Measurement Model (Outer Model)

Table 2. Outer Loading, Cronbach’s Alpha, Composite Reliability (CR), AVE, and VIF

Variable	Indicator	Outer Loadings	Cronbach’s Alpha	CR	AVE	VIF
Green Marketing (X)	X1.1	0.682	0.917	0.930	0.525	1.802
	X1.2	0.656				1.597
	X1.3	0.715				1.978
	X2.1	0.709				2.189
	X2.2	0.825				3.120
	X2.3	0.763				2.055
	X3.1	0.739				2.604
	X3.2	0.733				2.765
	X3.3	0.788				2.837
	X4.1	0.721				2.229
	X4.2	0.684				2.029
	X4.3	0.661				1.662
Brand Awareness (M)	M1.1	0.804	0.892	0.920	0.699	1.990
	M1.2	0.784				1.974

	M2.1	0.869				2.626
	M2.2	0.882				2.859
	M3	0.836				2.344
Brand Image (Y)	Y1.1	0.857	0.941	0.953	0.772	2.984
	Y1.2	0.907				3.988
	Y2.1	0.857				3.129
	Y2.2	0.907				4.252
	Y3.1	0.891				3.654
	Y3.2	0.850				2.844

Source: Processed data (2026)

Table 3. Discriminant Validity (HTMT)

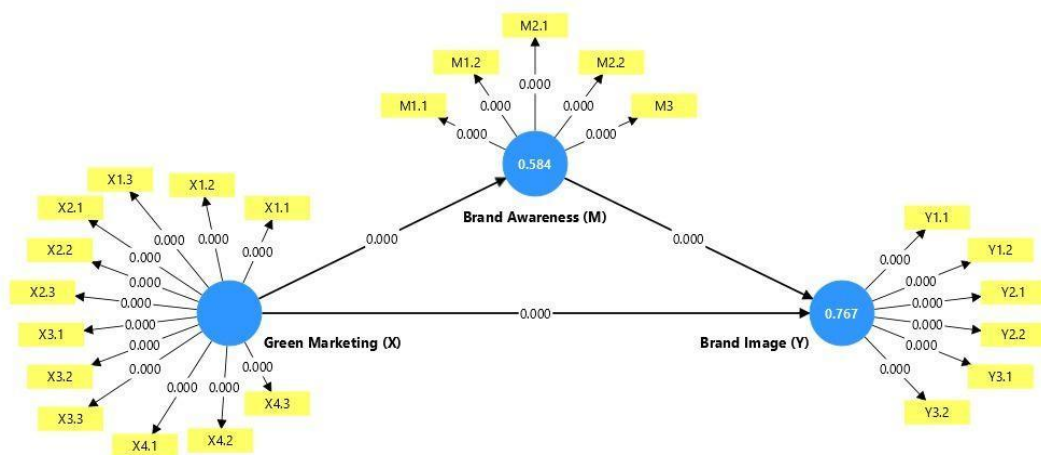
Construct Pairs	HTMT
Green Marketing ↔ Brand Awareness	0.840
Brand Awareness ↔ Brand Image	0.874
Green Marketing ↔ Brand Image	0.894

Source: Processed Data (2026)

Structural Model (Inner Model)

The structural model was evaluated to investigate the causal relationships among latent variables using the bootstrapping procedure in SmartPLS version 4.1.1.6. Figure 4 presents the structural model (inner model), while Tables 5–7 summarize the path coefficients, R², f², and mediation tests. The results indicate that:

1. Green Marketing → Brand Awareness: positive and significant ($\beta = 0.764$; $t = 19.428$; $p < 0.001$).
2. Green Marketing → Brand Image: positive and significant ($\beta = 0.520$; $t = 7.094$; $p < 0.001$).
3. Brand Awareness → Brand Image: positive and significant ($\beta = 0.411$; $t = 5.540$; $p < 0.001$).
4. Mediating effect: Brand Awareness significantly mediates the effect of Green Marketing on Brand Image ($\beta = 0.314$; $t = 5.414$; $p < 0.001$).



(Source: Processed Data, 2026)

Figure 5. Inner Model

Table 4. Inner Model Path Coefficient Results

Variable Relationships	Path Coefficient (β)	Interpretation
Green Marketing (X) → Brand Awareness (M)	0.764	Positive, strong
Green Marketing (X) → Brand Image (Y)	0.520	Positive, moderate
Brand Awareness (M) → Brand Image (Y)	0.411	Positive, moderate

Source: Processed Data (2026)

Table 5. Results of R-Square, f-Square, and Hypothesis Testing

Coefficient of Determination (R^2)		
Endogenous Variable	R^2	Adj R^2
Brand Awareness	0.584	0.581
Brand Image	0.767	0.764

Effect Size (f^2) and Hypothesis Testing

Relationship	f^2	β	Mean	STDEV	T-Stat	P-Value	Decision
Green Marketing → Brand Awareness	1.404	0.764	0.767	0.039	19.428	0.000	Accepted
Brand Awareness → Brand Image	0.303	0.411	0.404	0.074	5.540	0.000	Accepted
Green Marketing → Brand Image	0.484	0.520	0.528	0.073	7.094	0.000	Accepted

Source: Processed Data (2026)

Table 6. Mediation Test Results

Mediation Relationship	Path Coefficient (β)	T-Statistic	P-Value	Description
Green Marketing → Brand Awareness → Brand Image	0.314	5.414	0.000	Significant

Source: Processed Data (2026)

These results indicate that green marketing strategies play a significant role in strengthening consumer brand awareness and fostering a positive brand image. Furthermore, the influence of green marketing on brand image is exerted both directly and indirectly through enhanced brand awareness.

Discussions

The following discussion summarizes the key findings showing that green marketing enhances brand awareness and strengthens brand image. The mediation results suggest that brand awareness acts as a central mechanism, meaning that sustainability efforts are more likely to shape brand image when tourists first notice, recognize, and retain credible green signals associated with the brand. In the Bali hospitality context, this process is consistent with Tri Hita Karana, where harmony with nature is not only practiced operationally but also communicated in ways that are visible and meaningful to guests before it becomes part of their brand-image perceptions.

The Effect of Green Marketing on Brand Awareness

The findings demonstrate that green marketing plays a pivotal role in strengthening brand awareness within Bali's hospitality industry. This suggests that sustainability-based marketing strategies are not merely promotional activities but serve as mechanisms for communicating value, thereby increasing tourists' recognition and recall of the brand. In the hospitality context, many environmentally friendly practices are operational and not always directly visible to guests. Therefore, green marketing serves as a strategic instrument that bridges sustainability practices and consumer perceptions. These results align with the study by Murtiningsih and Junaedi (2025), which found that the integrated application of green marketing elements significantly increases consumer brand awareness, highlighting the cross-context influence of a coherent green marketing mix.

The strength of the relationship between green marketing and brand awareness can be explained by the visibility and credibility of sustainability signals in the study setting. Because the participating properties were verified through the Eco Climate Badge, sustainability cues are more likely to be perceived as authentic rather than self-declared claims, thereby enhancing signal credibility and clarity in accordance with Signaling Theory. In addition, most respondents reported prior exposure to green program information through websites, social media, and online reviews (eWOM), suggesting repeated exposure to sustainability cues across touchpoints before and during the stay. This repeated exposure increases the likelihood that green signals are noticed and retained in memory through recognition and recall, leading to stronger brand awareness.

In the context of Bali as an internationally recognized tourism destination, the strategic relevance of green marketing becomes increasingly pronounced, as tourists are becoming more sensitive to destination sustainability issues. International research in the green hospitality sector shows that sustainable marketing practices can strengthen brand perception by enhancing awareness of sustainable values and fostering positive perceptions of green brand innovation among customers (Baah et al., 2025). Furthermore, the consistent application of green marketing initiatives has been shown to significantly strengthen tourists' pro-environmental attitudes and their trust in eco-friendly destinations, thereby enhancing brand awareness and influencing the selection of sustainable tourism destinations (Chang et al., 2025).

Theoretically, these findings reinforce Signaling Theory, which posits that credible and consistent sustainability signals are more effective in shaping market perceptions. When green marketing practices are supported by tangible evidence, such as certifications or transparent environmental programs, these signals are more readily interpreted as authentic commitments (Marschlich & Hurtado, 2025). Conversely, discrepancies between green claims and actual practices can trigger perceptions of greenwashing, undermining the signal's effectiveness (Meenakshi et al., 2025). Thus, the impact of green marketing on brand awareness can be understood as a function of the readability and coherence of sustainability signals across multiple points of consumer interaction.

The Effect of Brand Awareness on Brand Image

The findings indicate that brand awareness serves as a critical foundation for brand image formation. Awareness enables tourists to recognize, recall, and differentiate among numerous similar accommodation options. When brand awareness is high, brand associations are more easily established and develop into positive and consistent brand perceptions. These results are consistent with the studies by Juni and Kustiawan (2025)

and Ledikwe (2020), which emphasize that brand awareness functions as a prerequisite for brand image formation.

Recent research in the hospitality industry also demonstrates that marketing communications that enhance awareness shape tourists' overall perceptions of a destination or service, subsequently influencing brand image evaluations (Simangunsong et al., 2025). Other studies in hotel and accommodation contexts confirm that awareness provides a cognitive foundation enabling the development of a strong brand image, indicating that these two variables are empirically interrelated in influencing consumer decision-making (Kelvin & Sarudin, 2024). The convergence of these findings reinforces the argument that brand image formation begins with recognition and familiarity.

In the context of rebranding Bali's hospitality industry toward a more sustainable image, brand awareness is the initial stage that determines the success of the transformation in brand perception. Conceptually, this relationship illustrates that brand image does not form instantaneously but develops through a gradual cognitive process. While green marketing can generate exposure, without adequate awareness, sustainability-related associations struggle to evolve into a robust brand image. Thus, brand awareness functions as a psychological mediating mechanism between marketing communications and the long-term formation of brand perceptions.

The Effect of Green Marketing on Brand Image

Implementing green marketing strategies can strengthen a positive brand image in hospitality because sustainability communications and cues influence how guests evaluate and perceive a hotel's overall image (Brañes et al., 2025; Topcuoglu et al., 2022). These sustainability signals communicated environmental responsibility and ethical business commitment, thereby strengthening sustainability-oriented brand associations. The findings indicate that green marketing directly contributes to the formation of a positive brand image. This suggests that tourists evaluate hospitality services not only on functional quality but also on symbolic and ethical business commitments, thereby strengthening sustainability-oriented brand associations.

These results are in line with prior research findings. Salsabila and Nasir (2026) and Tanhaei et al. (2024) demonstrate that the consistent implementation of environmentally friendly values enhances positive brand associations. Similarly, research in the tourism sector shows that the application of sustainable marketing elements such as green products, green promotion, and other environmentally oriented marketing strategies significantly improves perceptions of green brand image among tourists and tourism consumers (Uong, 2025). Furthermore, studies in the hospitality industry reveal that sustainable hospitality consumption value embedded through green marketing practices strengthens perceptions of innovation, trust, and green brand image, thereby reinforcing overall brand equity (Baah et al., 2025).

These findings confirm the strategic role of green marketing in shaping brand image in alignment with the evolving preferences of modern consumers, who are increasingly concerned about sustainability. However, the context of Bali introduces an additional dimension. The pressures of mass tourism have transformed sustainability from a mere marketing differentiator into a strategic necessity for destinations. In this context, green marketing in Bali's hospitality sector serves as a rebranding instrument aimed at constructing a more responsible, long-term-oriented destination image. Nevertheless, inconsistencies between sustainability claims and actual practices may damage brand credibility. Therefore, integrity and consistency in implementation are essential to maintaining brand trust and sustaining a positive brand image over time.

Mediation, Theoretical Contribution, and Strategic Implications

This study demonstrates that brand awareness mediates the relationship between green marketing and brand image, revealing the cognitive mechanisms underlying the formation of sustainability-based brand perceptions. Green marketing first generates exposure and brand recognition, which subsequently develops into associations and brand evaluations. These findings extend the application of Signaling Theory in the context of sustainable hospitality by emphasizing that the effectiveness of sustainability signals does not occur instantaneously but operates through cognitive stages before producing affective brand perceptions. Accordingly, the formation of a sustainability-based brand image is a gradual process influenced by the signal's credibility and interpretability.

The theoretical contribution of this study lies in integrating green marketing, psychological mediation processes, and the local cultural context of Bali. Unlike prior studies that primarily emphasize direct relationships among variables, this research demonstrates that sustainability, as a strategic value, must be communicated effectively to translate into brand image. In the context of Bali, the Tri Hita Karana philosophy, which emphasizes harmony among humans, culture, and nature (Wiryanata et al., 2025), provides a normative framework for sustainability practices. However, these values do not automatically translate into brand positioning without an appropriate communication strategy. Green marketing serves as a medium that conveys local values into messages comprehensible to global tourists, thereby strengthening the positioning of Bali's hospitality sector as a credible and sustainable destination.

Practically, these findings underscore that the success of green marketing depends on consistency between practice and communication. Sustainability claims must be supported by actual implementation to maintain credibility and reduce skepticism about greenwashing. Therefore, verified and consistently visible sustainability cues across pre-stay and on-site touchpoints are essential for strengthening awareness and supporting more coherent brand image formation.

Contextual Contribution and Managerial Implications

Bali has experienced a strong tourism recovery, which supports the economy but also intensifies environmental pressure related to resource use and waste, increasing the reputational stakes for hospitality brands operating in the destination (Bali Provincial Statistics Agency, 2025; KLH/BPLH, 2025). In such a high-exposure market, sustainability narratives can be communicated across multiple channels yet still be interpreted inconsistently by guests, creating a coherence gap between the projected and perceived green images (Seyfi et al., 2025). This challenge matters because tourists increasingly rely on online information search and online reviews when evaluating accommodation options, particularly for claims that are difficult to verify prior to consumption (Salameh et al., 2022).

This study is distinctive because it focuses on guests who stayed at properties verified by Eco Tourism Bali's Eco Climate Badge, thereby strengthening signal credibility through third-party validation (Eco Tourism Bali, 2025a, 2025b). From a signaling perspective, credible validation improves the interpretability of sustainability cues and helps reduce information asymmetry in hospitality markets (Spence, 1973; Steigenberger, 2025). Nevertheless, the mediation results indicate that credibility alone is insufficient when sustainability cues are not consistently noticed and retained across touchpoints, especially in information-dense contexts where deceptive or inconsistent signaling can undermine trust and weaken the impact of green communication (Seyfi et al., 2025; Steigenberger, 2025).

Given the significant mediating role of brand awareness, the findings provide clear operational guidance for how verified sustainability cues should be communicated across the guest journey. Managerially, sustainability rebranding should be treated as a staged process that deliberately builds awareness before expecting improvements in brand image. Priority should be given to high-visibility verification cues across pre-stay touchpoints, such as prominent badge display on official websites and OTA pages, concise sustainability summaries supported by verifiable evidence (e.g., third-party certifications, quantified environmental performance data, visual documentation of sustainability practices, and guest feedback reflecting observable green initiatives), and on-site cues that connect practices to guest experience. In addition, simplified evidence-based messaging should be easy to recognize and recall, and consistency between communicated claims and observable practices should be maintained across properties and guest touchpoints to preserve image coherence and reduce skepticism (Salameh et al., 2022; Seyfi et al., 2025; Steigenberger, 2025).

Conclusions

This study examined the influence of green marketing on brand awareness and brand image in Bali's hospitality industry and investigated the mediating role of brand awareness in this relationship. The findings confirm that the proposed research objectives have been successfully attained. Green marketing was shown to have a significant effect on both brand awareness and brand image, operating through direct pathways and indirectly via the mediating role of brand awareness. These results suggest that sustainability-oriented marketing strategies serve not merely as promotional instruments, but also as strategic mechanisms for cultivating credible brand perceptions among tourists.

Theoretically, this study advances the application of Signaling Theory within the context of sustainable hospitality by illustrating that the effectiveness of sustainability-related signals functions through sequential cognitive processes prior to the formation of a strong brand image. Moreover, integrating local Tri Hita Karana values into green marketing strategies enriches the literature by demonstrating that cultural values can serve as a foundation for destination positioning when communicated consistently and authentically.

Practically, the findings provide implications for hospitality practitioners and destination managers in Bali, emphasizing that the success of green marketing depends on the consistency between practice and communication. Sustainability claims must be supported by tangible, transparent implementation to maintain credibility and mitigate perceptions of greenwashing. An integrated green marketing strategy can serve as a rebranding tool to position destinations as more responsible and long-term-oriented.

This study has several limitations that should be considered when interpreting the findings. First, the sample was drawn exclusively from guests of a single hospitality group, specifically 13 properties under Inivie Hospitality verified through the Eco Climate Badge. This limited sampling frame may constrain the generalizability of the results to other hotel groups or properties without sustainability certification. Second, the study employed a cross-sectional design, capturing respondents' perceptions at a single point in time. Therefore, causal interpretations should be approached with caution and remain specific to the context of this research. Third, all constructs were measured using self-reported survey instruments, which may be prone to response biases, including common method variance and social desirability effects, despite voluntary and anonymous participation procedures.

For future research, it is recommended that the proposed model be extended to incorporate additional variables, such as brand trust, perceived green value, and customer loyalty, to more comprehensively capture the long-term behavioral outcomes associated with sustainability-based positioning strategies. Comparative studies across destinations and accommodation segments are also recommended to assess the model's robustness beyond a single hospitality group. Finally, longitudinal designs would be valuable to examine the stability of sustainability-based brand image over time as tourist preferences and sustainability expectations evolve.

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The Role of Indonesian Animal Quarantine Procedures in Supporting Sustainable Event/Exhibition Management

Annisa Wardhani¹, Christina L Rudatin², Raden Ayu Trisnayoni^{3*}, Asterina Anggraini⁴,
M. Iqbal Katik Rajoendah⁵

^{1,2,3,4,5} MICE Study Program, Politeknik Negeri Jakarta, Indonesia

*Corresponding Author: raden.ayutrisnayoni@bisnis.pnj.ac.id

Abstract: The organization of international pet exhibitions presents significant challenges related to public health, animal welfare, and event sustainability. Without strict quarantine procedures, the risk of spreading Animal Quarantine Diseases (in Indonesia regulation known as Hama dan Penyakit Hewan Karantina/HPHK) may threaten ecosystems, undermine event reputation, and erode stakeholder trust. Within the framework of green exhibitions and sustainable event management, animal quarantine is not merely a risk-control mechanism but also an ethical instrument that supports the three pillars of sustainability: environmental, social, and economic. This study aims to explain how animal quarantine procedures in Indonesia can be integrated into sustainable exhibition standards. The research design employs a descriptive qualitative approach, with the Indonesian Quarantine Agency at Tanjung Priok and Banten. Data were collected through direct observation and interviews with quarantine agency and examined thematically to identify procedural stages and their relevance to sustainability principles. The findings reveal that quarantine procedures in Indonesia encompass document preparation, physical examination, isolation with clinical and laboratory monitoring, and final stages including release, rejection, or destruction. These procedures contribute to green exhibitions by ensuring public health protection, safeguarding animal welfare, promoting digital administrative efficiency, and reinforcing compliance with international regulations. The implications of this research highlight that integrating animal quarantine into sustainable exhibition standards provides practical guidelines for exhibition organizers in Indonesia, while strengthening Indonesia's position as a responsible and sustainable host within the global MICE industry.

Keywords: animal quarantine, green exhibition, international pet exhibition, MICE industry, sustainable event management

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Introduction

According to a Custom Market Insights report on inbound MICE tourism (CMI, 2024a, b), the global MICE market value is projected to almost double from US\$547 billion in 2024 to US\$1 trillion by 2033, or 7.8% of the projected global tourism value in 2033. Mapped against the Organisation for Economic Co-operation and Development (OECD)'s projected 2033 world GDP of US\$86 trillion (OECD, 2021), the MICE/BD industry is estimated to contribute 1.2% of the world's GDP by 2033. The study of the current state of sustainability in the MICE/BD industry is thus important considering the size and significance of the industry (Koh, 2025).

The MICE (Meetings, Incentives, Conferences, and Exhibitions) industry in Indonesia is rapidly shifting toward sustainable practices to mitigate environmental and

socio-cultural impacts (Li et al., 2025). According to the Global Association of the Exhibition Industry (UFI), sustainability in exhibitions extends beyond waste management to include risk mitigation and ethical standards. In this context, animal quarantine serves as a critical biosecurity instrument that ensures international pet exhibitions align with green exhibition principles by preventing ecological disruption and safeguarding public health.

While current "green exhibition" frameworks prioritize waste management, energy efficiency, and green venues (Wee et al., 2021), a critical gap remains in managing biosecurity risks—specifically animal quarantine—within international pet exhibitions. This oversight is significant because cross-border animal mobility inherently risks spreading diseases and zoonoses, which directly threatens public health and biodiversity (Wyatt et al., 2021).

Despite the urgency, existing Indonesian quarantine regulations (Law No. 21/2019) are often implemented purely as administrative hurdles rather than holistic sustainability instruments. Studies indicate that current policies lack effective coordination and fail to integrate the socio-cultural dimensions of sustainability (Husain et al., 2025; Simatupang, 2025). Furthermore, while digital modernization through systems like IQFAST 2.0 enhances surveillance (Hartati, 2025), animal quarantine has yet to be formally recognized as a component of the green exhibition discussion in Indonesia (MR & Firmansyah, 2023).

However, the literature has not yet provided a clear framework for this integration. Therefore, this research seeks to address the following questions:

1. How can Indonesia's animal quarantine procedures be integrated into sustainable exhibition standards?
2. What procedural stages are most critical to aligning biosecurity with sustainability principles in the MICE industry?

To address these gaps, this study employs a qualitative research design with a descriptive qualitative approach to evaluate the integration of quarantine protocols into sustainability standards. Primary data were gathered through semi-structured interviews with officials at the Animal Quarantine Station of Soekarno-Hatta, providing first-hand operational insights. This was complemented by an extensive documentary analysis of credible institutional records, including Law No. 21 of 2019, relevant Ministerial Regulations, and other legal frameworks governing biosecurity in Indonesia. The data were examined using content analysis to identify procedural themes and their alignment with green exhibition principles, such as environmental protection, social responsibility, and economic viability. This methodology ensures a comprehensive evaluation of how regulatory procedures can be practically transformed into sustainable guidelines for the international MICE industry.

Methodology (Candara, 14 pt, Bold)

This study uses a descriptive qualitative approach to analyze the integration of animal quarantine procedures in Indonesia into a sustainable event and exhibition management framework. This methodology emphasizes descriptive data, natural settings, inductive reasoning, and interpretation (Waruwu, 2024). It is flexible, allowing researchers to use various theoretical approaches and sampling techniques (Hall, 2024), and provides a systematic and factual summary of phenomena (Furidha, 2023). This approach is appropriate for in-depth exploration of procedural mechanisms, regulatory compliance, and operational challenges. The study aims to explain how biosecurity protocols function as ethical and

practical instruments that support the three pillars of sustainability (environmental, social, and economic) in the MICE industry.

This research was conducted at the Tanjung Priok Quarantine Agency and the Banten Quarantine Agency. Primary data were obtained from key informants at both agencies. Secondary data included relevant Indonesian regulations, institutional guidelines, green exhibition standards, and MICE industry reports. Data collection involved field observations at the Quarantine Agencies to observe the implementation of animal handling and laboratory monitoring, and semi-structured interviews with agency officials regarding processes such as document verification, physical exams, and biosecurity enforcement. Qualitative data were analyzed using Thematic Analysis

Results and discussions

Results

Preserving Social Sustainability through Zoonotic Risk Containment and Public Safety

The primary function of animal quarantine—encompassing the verification of Health Certificates and rabies serology tests—transcends mere clinical duty; it serves as a critical social safeguard. In the context of international exhibitions, these procedures act as the fundamental layer of social sustainability by mitigating the risk of high-fatality zoonotic outbreaks at the event venue.

Table 1. The Intersection of Biosecurity Protocols and Social Sustainability Goals

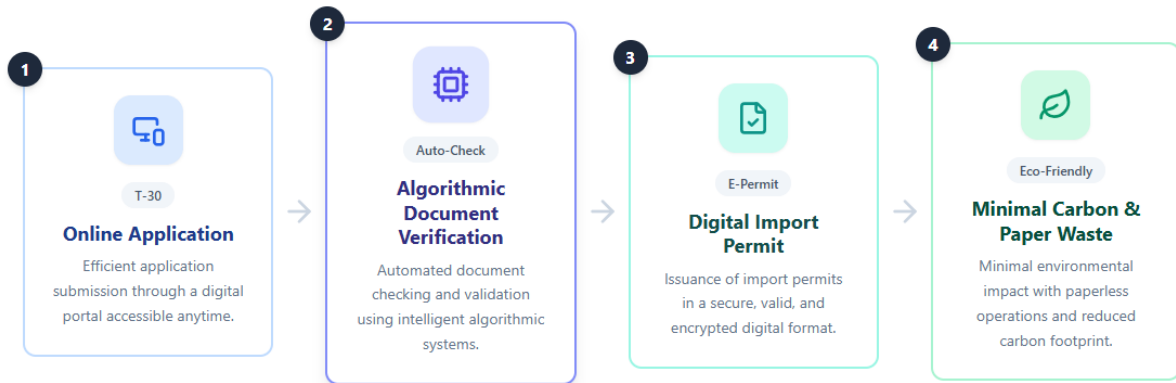
Technical Procedure	Mitigated Risk	Sustainable Event Contribution
Health Certificate Validation	Pathogen Introduction	Public Health & Safety Assurance
Clinical Inspection	Local Fauna Infection	Environmental & Community Protection
Microchip Identity Matching	Fraud & Illegal Trade	Ethical Compliance & Integrity

(Source: Processed data, 2025)

The data from field observation findings reveal that biosecurity is a "social license to operate" for international exhibitions. A single zoonotic incident would not only jeopardize public health but also cause irreversible damage to the reputation of the host destination's MICE industry. By institutionalizing these checks, the quarantine agency provides a safety guarantee that allows organizers to fulfill their ethical obligations. This aligns with the non-negotiable pillar of social sustainability regarding stakeholder protection (Singh et al., 2020). Over the past few years, the worldwide emphasis on sustainability has had a major impact on many industries, such as event management (Smith, 2021). Events frequently generate substantial waste, leading to environmental and social challenges (Surbhi, 2025). The framework of sustainable event management, social sustainability is defined by an event's ability to maintain a harmonious and safe relationship with its host community. The quarantine procedure acts as the primary barrier against "biological externalities"—negative impacts that an event might inadvertently impose on society. By ensuring that no pathogens cross from the exhibition floor to the local population, the quarantine process transforms the event from a potential bio-risk into a socially responsible platform that prioritizes human and animal well-being over mere economic gain.

Leveraging Digital Governance as a Catalyst for Green Exhibition Standards

The transition to digital platforms represents more than administrative efficiency; it is a strategic move toward "Green MICE" governance. By digitizing the pre-event approval process, the quarantine agency systematically reduces the environmental footprint associated with traditional paper-based bureaucracies.



(Source: Processed data, 2025)

Figure 1. The Digital Workflow as a Driver for Resource Efficiency

Digital integration acts as a catalyst for environmental sustainability by eliminating physical document transport and redundant paperwork. This "Green Administrative" model forces event organizers to adopt proactive planning (H-30 submission), reducing the high-waste logistical rushes typical of manual systems. Digital synchronization is a prerequisite for modern, sustainable law enforcement, ensuring that regulatory compliance does not come at an environmental cost. The correlation with green exhibitions lies in the "Dematerialization" of event logistics. Sustainable event standards, such as ISO 20121, emphasize the reduction of resource consumption throughout the event lifecycle. The use of the *Best-Trust* system directly supports this by institutionalizing a paperless workflow and reducing the carbon emissions associated with the physical mobilization of couriers and administrative personnel. Consequently, animal quarantine serves as an unintentional yet effective "green partner" that enforces environmental best practices within the event's supply chain.

Balancing Economic Vitality with Ecosystem Preservation via Regulated Entry

The classification of exhibition animals under "temporary entry" (*pemasukan sementara*) status ensures that the economic benefits of MICE activities do not lead to biological degradation. This regulatory framework creates a protected "bubble" for the event, preventing foreign biological assets from entering the local supply chain or ecosystem. The prohibition of commercial transactions during pet exhibitions serves as an ethical filter that separates legitimate educational exchange from high-risk illegal trade. This mechanism ensures that the event's economic contribution is high-quality and low-risk. By strictly defining the spatial boundaries of the animals' presence, quarantine procedures prevent "biological dumping," that quarantine is an integrated environmental protection instrument (Simatupang, 2025). This procedure directly correlates to the "Environmental Integrity" of a sustainable exhibition. A truly sustainable

event must ensure that its temporary presence does not cause permanent ecological damage. By enforcing "temporary entry" and spatial isolation, the quarantine procedure prevents invasive species or foreign pathogens from escaping the event perimeter and disrupting the local biodiversity. This ensures that the event remains an "ecological neutral" activity, where the temporary influx of foreign animals is strictly managed to prevent long-term environmental liabilities for the host region.

Enhancing Event Accountability through Digital Traceability and Identity Standards

The mandatory use of ISO-standard microchips shifts the exhibition paradigm from subjective visual inspection to objective, data-driven accountability. This traceability system ensures that every biological asset within the event perimeter has a verifiable and untamperable health history.

STAGE	ACTION & DESCRIPTION	SUSTAINABILITY OUTCOME
Origin Tagging	ISO-Standard Microchip Embedding Securing the biological asset's identity at the source.	Data Integrity: Eliminates the risk of illegal animal trafficking and fraud.
Identity Verification	Real-time Digital Cross-referencing Matching physical microchips with "Best-Trust" digital permits.	Transparency: Ensures only verified, healthy animals enter the event perimeter.
On-site Monitoring	Dynamic Health & Safety Tracking Routine clinical checks within the biosecurity 'bubble'.	Risk Mitigation: Prevents social and environmental harm from potential outbreaks.
Verifiable Audit Trail	Accountability & Compliance Logging Creating a permanent record of all health interactions.	Governance: Provides empirical evidence for sustainable event certifications.

(Source: Processed data, 2025)

Figure 2. The Traceability Loop for Accountable Exhibitions

Identity accuracy is the backbone of "Transparent MICE." Traceability prevents the infiltration of "shadow participants"—animals without health clearances—that could otherwise compromise the biosecurity of the entire exhibition. This technology-driven oversight creates an accountable ecosystem in which organizers can demonstrate, with empirical data, that their event adheres to international animal welfare and biosecurity standards. This aligns with the "Governance and Transparency" pillar of sustainability. Modern sustainable event management requires rigorous reporting and verification of all event assets. The microchip system provides a "Digital Passport" that serves as an audit trail for the event's biosecurity performance. By providing verifiable data on every animal, the quarantine procedure enables event organizers to demonstrate full accountability to regulators, sponsors, and the public, thereby elevating the event's credibility and its alignment with global ethical exhibition standards.

Achieving Circularity in Event Management through Closed-Loop Biosecurity

The re-export protocol, which requires the mandatory return of all exhibition animals to their country of origin, serves as the final phase of a "closed-loop" management system. This ensures that the event lifecycle is completed without leaving behind any uncontrolled biological residues in the host country.

Table 2. Lifecycle Analysis of Quarantine Integration in Sustainable Events

Event Lifecycle Phase	Quarantine Intervention	Sustainability Objective
Pre-Event	Digital Document Audit	Administrative Waste Reduction
Operational Phase	Spatial & Clinical Isolation	Real-time Risk Mitigation
Post-Event Closure	Re-export Verification	Zero-Residual Biological Impact

(Source: Processed data, 2025)

The re-export requirement is the biological equivalent of a "Zero Waste" policy. In sustainable event theory, a circular event must manage all inputs to ensure they do not become harmful outputs. By verifying that animals "arrive healthy and depart healthy," quarantine guarantees that the event has a net-zero impact on the host country's biodiversity. This reflects the "Circular Economy" approach in event management. A sustainable event is one that leaves no trace (or a positive one). The re-export procedure ensures a "Zero Biological Residual" outcome, mirroring the waste management principle where every item brought into a venue must be taken out. By enforcing this post-event closure, the quarantine agency ensures that the "biological cycle" of the event is fully resolved, preventing any long-term pathogen persistence that could jeopardize the environment. This makes the event truly sustainable by ensuring its impact is confined strictly to its designated timeframe and location.

Discussions

This study aimed to explain how animal quarantine procedures in Indonesia can be integrated into sustainable exhibition standards. The findings demonstrated that quarantine procedures at Soekarno-Hatta and Tanjung Priok—encompassing four sequential phases (preparation, implementation, monitoring, and final phase)—possess direct relevance to the core dimensions of sustainable event management, specifically in mitigating environmental risks and ensuring social safety. Accordingly, the research aim and question have been comprehensively addressed through empirical data obtained from observations and interviews.

The primary significance of these findings lies in the construction of a conceptual bridge between two domains of knowledge that have thus far developed in isolation. In the sustainable event management literature, the focus has predominantly been on "green" operational practices. Wee et al. (2021) identified characteristics of green event practices in MICE tourism such as green venues and waste management, while Gonçalves et al. (2025) emphasized recycling, energy efficiency, and digitalization. However, even as Mair et al. (2024) called for broader event type coverage and non-Western contexts, the literature has remained "bio-blind" regarding animal biosecurity. Conversely, veterinary literature, like Biggs & Young (2025), focuses on technical disease transmission risks without framing them as part of event sustainability.

This study explicitly bridges this gap by demonstrating that biosecurity is not a separate technical issue, but a fundamental pillar of a "Green Exhibition." By integrating

biosecurity into the event sustainability discourse, this research expands the definition of "environmental sustainability" in MICE to include the protection of local ecosystems from foreign biological hazards, thereby providing a more holistic framework for sustainable exhibition standards.

A critical reflection on these findings reveals a fundamental contradiction between general green event practices and quarantine-led sustainability. Most sustainability practices in events are typically voluntary and frequently constrained by high costs and limited organizer commitment (El-Said et al., 2025; Gonçalves et al., 2025). However, this study identifies that in the context of animal-inclusive events in Indonesia, sustainability is achieved through "mandated compliance." Because quarantine procedures are underpinned by legal obligations under Law Number 21 of 2019, they operate with a degree of structure that voluntary green initiatives often lack.

This implies a theoretical shift: for high-risk exhibitions, "greenness" is not just a choice made by the organizer, but a regulatory requirement. The success of Indonesian quarantine in supporting sustainable event management suggests that regulation-based integration possesses a significant implementation advantage over purely voluntary dimensions, ensuring that environmental and social safeguards are consistently applied regardless of the organizer's sustainability maturity.

Despite the sound procedural framework, this research identifies critical limitations that hinder the full realization of a "Digital Green Exhibition." The requirement for physical document verification and the infrastructure gap at non-primary entry points are consistent with the findings of Husain et al. (2025) and Narut et al. (2025) regarding the suboptimal implementation of quarantine policies in regional areas. This indicates a "digital-operational divide" where the theoretical benefits of paperless systems (like *Best-Trust*) are partially negated by the persistence of manual bureaucracy. This limitation suggests that while the procedural framework for a green exhibition is in place, the implementation capacity—particularly in digital consistency—still requires strengthening to meet global sustainable MICE standards.

The implications of this research demonstrate that animal quarantine is not merely a risk-control mechanism but an ethical instrument bridging biosecurity and event sustainability. For international event organizers, these findings provide practical guidelines for integrating quarantine procedures into green exhibition planning, ensuring that biological safety is treated as a core sustainability KPI. For Indonesia, this integration reinforces its position as a responsible and sustainable host within the global MICE industry. Future research should explore event organizers' and exhibitors' perspectives on quarantine procedures and develop a quantitative evaluation framework to measure biosecurity's specific contribution to event sustainability indices.

Conclusions

This study demonstrates that animal quarantine procedures in Indonesia serve as a fundamental structural framework, rather than a peripheral regulatory requirement, for the realization of sustainable exhibition standards. By successfully integrating rigorous biosecurity protocols into the management of international pet exhibitions, this research identifies a critical intersection where veterinary control transforms into a strategic instrument for institutional and environmental responsibility. A significant outcome of this inquiry is the conceptualization of "Biological Integrity" as an essential, yet frequently overlooked, dimension of the green exhibition discourse. While established literature on sustainable events has traditionally focused on carbon footprints and waste reduction, this research argues that the systematic containment of zoonotic risks and the protection of local biodiversity are equally vital to an event's sustainability profile.

This finding addresses a distinct gap between veterinary biosecurity and MICE management, offering a comprehensive model for responsible event hosting in a non-Western context.

The implications of these findings suggest that for the global MICE industry, sustainability frameworks and certifications should be expanded to include biosecurity metrics, particularly for events involving live biological assets. For organizers, the research implies that quarantine compliance must be repositioned as a core Key Performance Indicator (KPI) of their sustainability strategy to enhance stakeholder trust. Indonesia's structured quarantine system provides a robust benchmark for this integration, reinforcing its credibility as a destination committed to high-standard, sustainable event management.

Future research directions should focus on developing quantitative sustainability indices that incorporate biosecurity performance and exploring multi-stakeholder perspectives to ensure the inclusivity of these standards. Comparative studies across different regulatory jurisdictions would further refine international best practices, ensuring that the global expansion of the exhibition industry remains aligned with the principles of biological and environmental safety.

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Building Social-Ecological Resilience in Batukaras Coastal Tourism Village, Indonesia

Ade Tri Putra^{1*}

¹Development Studies, Bandung Institute of Technology, Indonesia

*Corresponding Author: adetriputra1@gmail.com

Abstract: Batukaras Village in Cijulang District, Pangandaran Regency, is known as a beach tourism area, as mandated by Village Regulation No. 5 of 2020, aiming to establish itself as an integrated and leading tourist destination. However, climate change and the intensification of coastal activities have increased pressure on marine resources and accelerated coastal environmental degradation. These conditions have created challenges that threaten ecological balance, local livelihoods, and the long-term sustainability of tourism. This study explores socio-ecological responses to environmental and social disruptions in Batukaras. Using a qualitative case study approach, data were collected through observation, documentation, literature review, and in-depth interviews with key informants. The analysis adopts a Social-Ecological Resilience (SER) framework to understand community adaptive capacities and institutional responses. Data analysis combined SER indicators with triangulation techniques to describe patterns of environmental change and socio-ecological interactions within the coastal tourism area based on observed phenomena. The phenomenon examined is the increasing socio-ecological vulnerability in Batukaras resulting from climate change, intensified coastal tourism activities, and tsunami hazards. The study identifies local adaptive responses, including efforts to coexist with environmental changes and limited governmental initiatives promoting ecosystem protection and social equity. In-depth interviews involved nine key informants, including village officials, tourism actors, community leaders, and local residents. To enhance resilience, the study recommends improving resource management, strengthening stakeholder participation in sustainable tourism planning, reinforcing collaborative governance, and integrating local knowledge into policy design to support long-term community welfare, adaptive capacity, disaster preparedness, and environmental sustainability.

Keywords: Coastal, Social-Ecological Resilience, Sustainable Tourism

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Introduction

Batukaras Village, located in the Cijulang District of Pangandaran Regency, Indonesia, has been officially recognized as a Regional Strategic Tourism Area (Regional Regulation Pangandaran, 2018). Supported by Village Regulation Batukaras (2020), the village is well known for its tourist attractions, particularly Batukaras Beach and the nearby mangrove forests, which play a central role in the community's tourism-based economy. The local vision emphasizes a cohesive and sustainable tourism approach aimed at fostering prosperity by ensuring a pleasant, clean, safe, welcoming environment that provides unforgettable experiences.

Even with these goals, Batukaras encounter serious ecological issues. Fluctuations in weather patterns, including intense rains and shifting winds, have resulted in tidal floods and excessive sediment, hindering tourism entry and harming local attractions (Kompas, 2022; Somantri, 2023). The shared utilization of coastal areas

for both tourism and conventional fishing has negatively impacted environmental conditions and diminished the resilience of ecosystems (Maman, 2023). Insufficient safeguarding of mangrove forests and restrictions in infrastructure have additionally obstructed the community's capacity to gain advantages from tourism (Ayi, 2023). According to Indonesia Statistics in Pangandaran (2023), tourist arrivals peaked in 2018 at 593,717 visits, followed by a decline in subsequent years, reaching 349,278 in 2020. A moderate recovery occurred in 2021, with 380,577 visits, indicating a gradual resurgence of tourism activity after the crisis.

The Village Report of Batukaras (2022), flood occurrences start at the conclusion of the dry season and intensify as the rainy season arrives, which generally runs from December to February. The most severe floods are observed between October and February, showcasing the significant rainfall that typifies this period. Potholes and muddy pathways become serious concerns, indicating that the village's road infrastructure suffers considerably from intense rainfall and inadequate drainage. These infrastructural difficulties significantly impact coastal tourism, especially by restricting access and diminishing the effectiveness and attractiveness of tourism-related facilities.

To address these issues, it is essential to embrace a Social-Ecological Resilience (SER) viewpoint that looks into the intricate reliance between natural systems and human actions. SER offers a structure to evaluate how communities adjust to transformations, resolve resource disputes, and maintain socio-ecological roles over time. As resilience diminishes, vulnerability rises, endangering the ability to adapt and innovate (Folke, 2006).

According to Anderies et al. (2004), a social-ecological system is defined as an integrated system composed of a resource, the users of that resource, the public infrastructure (physical and institutional), and the providers of that infrastructure, all of which interact within a context of external social, economic, and environmental settings. Inadequate management of the interconnections between resources, resource users, and public infrastructure may lead to overexploitation and environmental degradation, thereby indicating a considerable vulnerability in the sustainability of coastal ecosystems (Anderies et al., 2004; Hafsaridewi et al., 2018; Sjafrie, 2018; Muliani et al., 2018).

Furthermore, the Social-Ecological System (SES) framework, as proposed by Ostrom (2009), analyzes the dynamic interactions between humans and nature in the context of sustainable resource management. It comprises four core components: the resource system, resource units, governance system, and actors. The system is dynamically interconnected between human activities that affect and are affected by ecosystems, a relationship known as social-ecological connectivity (Ostrom, 2009; Virapongse and Alessa, 2016; Taghilou et al., 2022).

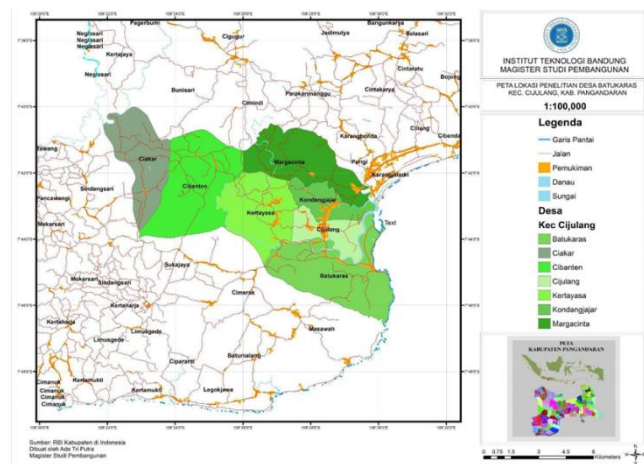
In this study, SER is used to analyze the interrelation between coastal ecosystems and tourism activities in Batukaras Village, with the goal of enhancing local resilience, promoting adaptive capacity, and supporting sustainable development. Moreover, the Social-Ecological Production Landscapes and Seascapes (SEPLS) framework developed by UNU-IAS (2014) provides key indicators for resilience, such as biodiversity conservation, social equity, local knowledge systems, and collaborative governance. Local knowledge and cultural practices play a pivotal role in maintaining the resilience of socio-ecological production landscapes and seascapes (SEPLS), as they embody traditional wisdom in sustainable natural resource management, while strengthening community governance particularly in facilitating intergenerational knowledge transfer is essential to ensure long-term sustainability, and the application of indicator-based participatory approaches further enhances community legitimacy and improves the

accuracy and relevance of policy interventions in landscape management (ANU IAS, 2014; Lee et al., 2020; Aydin et al., 2018).

Based on the foregoing context, this study focuses on examining how local communities in Batukaras Village respond to and adapt to socio-ecological disruptions arising from climate change and intensified coastal activities. It also analyzes the roles of local institutions and governance arrangements in shaping these adaptive responses and managing coastal tourism resources. Furthermore, the study explores the implications of these community and institutional responses for strengthening social-ecological resilience and enhancing sustainable coastal tourism governance in Batukaras Village. This research is urgent due to the increasing socio-ecological vulnerability of Batukaras Village driven by climate change, coastal tourism pressures, and disaster risks, which threaten the sustainability of local livelihoods and coastal ecosystems.

Methodology

This study employed a qualitative descriptive approach, aiming to explore and understand the dynamics of socio-ecological systems and resilience in the context of coastal tourism. As stated by Creswell (2016), qualitative methods are suitable for examining social phenomena experienced by individuals or groups. A case study approach was adopted to explore in-depth the interactions between tourism and coastal ecosystems in Batukaras Village. This method enables the researcher to gather detailed contextual information from multiple sources, including stakeholders involved in coastal activities (Creswell, 2012).



(Source: Processed by Putra, 2023)

Figure 1. Research Location Map of Batukaras Village, Cijulang District, Pangandaran Regency

The research was conducted in Batukaras Village, Cijulang District, Pangandaran Regency, West Java, Indonesia (see **Figure 1**). This location includes two main coastal tourism objects: Batukaras Beach and the Mangrove Forest, both located in Batukaras and Sanghiangkalang hamlets. These areas are known for their ecological and economic significance and classified as regional tourism strategic zones. The coordinate point of Batukaras Village is at 7°45'20.0"S 108° 28' 51.7"E. The interview data were collected from February to April 2023. The study used both primary and secondary data sources. Primary data were obtained through in-depth interviews with selected key informants using purposive sampling. Informants included representatives from the Department of Tourism and Culture, Department of Marine and Fisheries, Village Officials, the Village Community Empowerment Agency, Mangrove Forest Guardian, and Tourism Awareness

Groups. Secondary data were collected from relevant Government Documents, Regulations, Geospatial Documents, and the Central Bureau of Statistics Pangandaran. Data were collected using three primary techniques: direct observation of social-ecological interactions during tourism activities; semi-structured interviews guided by pre-determined questions with flexibility for deeper exploration; and document analysis to verify and enrich primary data through the review of relevant policies, regulations, and historical records. This study assesses Batukaras coastal tourism through key SES and resilience indicators, including resource system condition, user interactions, resource units, and governance structures. Findings show ecological pressure on mangrove and coastal systems, adaptive shifts in community livelihoods, and the presence of regulatory mechanisms for tourism and fisheries management. Social and ecological resilience is reflected in community participation, collaborative governance, ecosystem protection efforts, and livelihood diversification. Strengthening institutional coordination and sustainable resource management remains essential to enhance overall socio-ecological resilience

Results and discussions

Learning to Live in Change and Uncertainty

1. Community Responses to Coastal Development Initiatives

"Port infrastructure is essential, especially to support tourism activities. Until now, the shoreline has been crowded with fishing boats, which interfere with tourism operations" (Ganjar, Coordinator of the Coastal Fishery Port, Batukaras Village, interview April 3, 2023)

"The planned zoning for fishermen aims to remove boats from the main tourist beach. However, there has been no implementation yet. The designated port location is near the fishermen's residential area. Therefore, it needs to be facilitated so that boats do not occupy tourist areas" (Tourism Awareness Group, interview, April 3, 2023)

"Fishing activities influence the coastal zone, particularly due to the presence of fishing boats that interfere with tourism activities. In addition, weather conditions also affect fishing operations" (Mardiana, Junior Expert in Capture Fisheries Production Management, Department of Marine Affairs, Fisheries, and Food Security Pangandaran Regency, interview April 5, 2023)

The development of port infrastructure in Batukaras Village is crucial to support the integration between fisheries and coastal tourism activities. Currently, the shoreline is congested with fishing boats, which has led to spatial conflict and interference with tourism operations, particularly on the main beach area. Although zoning plans have been proposed to relocate fishing vessels away from primary tourism zones, there has been no implementation to date. The proposed relocation site is situated near the fishermen's residential areas, which requires infrastructural support to ensure effective and sustainable separation of uses. Furthermore, the coexistence of tourism and fishing activities presents challenges not only in terms of spatial overlap but also due to environmental factors such as weather conditions, which influence fishing patterns and vessel movements. According to the Batukaras Report (2023), fish production showed a consistent upward trend from 2020 to 2022. Output increased from 216,265 kg in 2020 to 303,402 kg in 2021, and peaked at 659,878 kg in 2022. This growth reflects improved fishing activities, resource availability, or enhanced management practices in the fisheries sector. Resilience in socio-ecology is significantly shaped by the system's adaptive capacity, knowledge co-production, and sustained innovation (Folke, 2006). Mangrove ecotourism contributes significantly to economic growth, coastal ecosystem

conservation, and the enhancement of local livelihoods to mitigate potential adverse effects (Moussa et al., 2024)

2. Community-Based Initiatives Supporting Tourism Activities

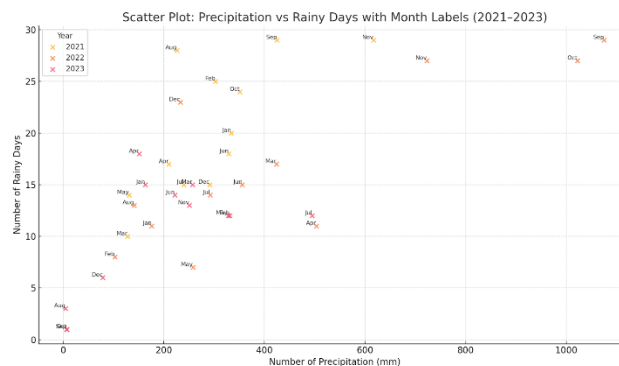


(Source: Putra, 2023)

Figure 2. Conditions Batukaras Mangrove

"Access to the mangrove forest is still inadequate. During the rainy season, the path becomes muddy and difficult to traverse. The route currently used passes through aquaculture ponds, which are not suitable for public access. Previously, the parking area consisted only of compacted sand and gravel, without any concrete or asphalt pavement. During peak seasons, both cars and motorcycles are parked far from the mangrove site due to limited space. There is not even a drainage system, let alone proper road infrastructure leading to the area" (Tourism Awareness Group, Batukaras Village, interview April 3, 2023)

Access to the Batukaras mangrove ecotourism area remains inadequate (see **Figure 2**). During the rainy season, the path becomes muddy and difficult to traverse, and the current route passing through aquaculture ponds is unsuitable for public use. Parking facilities are limited, consisting only of unpaved sand and gravel, forcing visitors to park far from the site during peak seasons. Additionally, the lack of drainage and proper road infrastructure further restricts accessibility. These limitations underscore the urgent need for basic, sustainable infrastructure to support mangrove tourism development. Regardless of the situation, the findings from this study indicate that community-based tourism, which fosters a specific connection within a socio-ecological framework and aims for sustainability, has the potential to enhance the resilience of socio-ecosystems, thereby lowering their risk. Based on this understanding, a more reliable approach could be developed to assess the sustainability of community-based tourism. The concept of socio-ecological resilience could be incorporated into various models that aim to evaluate the impact of CBT (Cumming et al., 2005; Kibicho, 2008; Okazaki, 2008; Simpson, 2008)



(Source: Statistics Indonesia, Pangandaran Regency, 2023)

Figure 3. Precipitation and Rainy Days with Month 2021-2023

In September 2022, over 1000 mm of rainfall was recorded alongside 29 rainy days, indicating intense and frequent rainfall (see **Figure 3**). Extreme patterns were observed in September and October 2022, with exceptionally high rainfall (>1000 mm) and more than 25 rainy days. In contrast, August to October 2023 experienced minimal rainfall (5–7.5 mm) and only 1–3 rainy days, reflecting a pronounced dry season. Seasonally, months like January, February, March, and November generally mark the wet period, whereas August to October 2023 stands out as a distinctly dry interval. Strategies and guidelines for managing tourism destinations after natural disasters, including planning, marketing, trust, cooperation, and resilience (Esteveo and Costa, 2020). Muliani et al. (2018) present a case study of socio-ecological systems in the coastal villages of Subang Regency, Indonesia, showing that these systems are shaped by interactions between marine resources (fisheries and mangroves) and local communities as primary users. Inter-village connectivity operates through social (education and fishermen institutions) and ecological (shared fishing grounds and mangrove use) networks, forming an integrated system. The study also identifies key coastal constraints, including environmental degradation, land-use change, and socio-economic vulnerability, which challenge sustainable management.

Social Justice Government

1. Social Capital for Coastal Cooperation Activities

"Private sector participation, particularly through investment, has contributed to job creation in rural tourism sectors such as hotels, homestays, and restaurants." (Somantri, Head of Batukaras Village, interview April 6, 2023)

"Surfing and photography services typically receive guidance from the village administration and the tourism office, particularly regarding the establishment of coastal tourism preservation groups" (Maman, The Village Community Empowerment Agency, interview April 6, 2023)

Private sector investment has contributed to employment growth in Batukaras Village's tourism sector, particularly in hospitality services such as lodging and dining. Simultaneously, local tourism micro-enterprises including surfing and photography are supported through institutional guidance and the formation of tourism preservation groups, enhancing community-based coastal tourism initiatives. According to Indonesia Statistics in Pangandaran (2023), Batukaras Village exhibits the highest concentration of accommodation facilities in the Cijulang Subdistrict, with a total of 92 establishments comprising 14 hotels and 78 guesthouses. Individuals within and across communities are interconnected through collaborative networks that facilitate the management of resources and the exchange of materials, skills, and knowledge (ANU IAS, 2014)

2. Government Management Rights for Coastal Tourism Activities



(Source: The Village Government, 2023)

Figure 4. Village-based waste management plays a critical role in promoting environmental sustainability at the local level

"Tourism waste management in Batukaras Village is primarily funded through tourism levies. Since 2020, efforts toward independent waste management have been initiated, starting with Batukaras Hamlet, while two other hamlets are in progress. Waste handling facilities include a 3R (Reduce, Reuse, Recycle) waste station equipped with machines for processing organic and inorganic waste, supported by a program from the West Java provincial government. The village government has also provided waste separation and incineration tools in two hamlets, particularly in tourist areas such as Batukaras and Sanghiangkalang, which are still managed by the local government. In some areas, waste is independently managed through open burning, including in home gardens. However, improper waste disposal remains an issue, as some residents continue to dump waste into rivers due to the inconvenience of proper handling" (Somantri, Head of Batukaras Village, interview April 1, 2023)

Since 2020, Batukaras Village has implemented a tourism-funded waste management system, beginning with community-led efforts in Batukaras Hamlet and expanding to others (see **Figure 4**). A 3R (Reduce, Reuse, Recycle) facility, supported by the local government, serves as the core infrastructure for processing organic and inorganic waste. The village administration has also equipped key tourist areas such as Batukaras and Sanghiangkalang with waste separation and incineration tools. However, challenges persist, including open burning and river dumping, driven by limited infrastructure access and inadequate public compliance. According to the Batukaras Village Report (2022), the village sanitation infrastructure consists of 1 temporary waste disposal site, 2 cart-based waste transport units, and 64 waste bins; additionally, sanitation services are supported by 2 individual waste management personnel. This indicates a basic but operational community-based waste management system. The resilience of a landscape or seascape is reflected in its capacity to recover and regenerate following environmental disturbances such as extreme weather events, climate-induced stressors, or anthropogenic pressures and is often supported by institutional mechanisms, including formal legislation, policy frameworks, or customary systems (ANU IAS, 2014)

3. Government Protection of Marine Ecosystems

"Fishing activity regulations, ranging from national to local levels, emphasize the use of environmentally friendly and non-destructive fishing gear, in accordance with sustainable marine capture guidelines. A fish marketing program has also been implemented, requiring all fishers in the Fish Landing Base of Batukaras and Nusawiru Hamlets to report their marine catches. This initiative facilitates direct transactions between fishers and buyers" (Mardiana, Junior Expert in Capture Fisheries Production Management, Department of Marine Affairs, Fisheries, and Food Security, Pangandaran Regency, interview April 5, 2023)

Law No. 45 of 2009 on Fisheries prohibits the use or possession of fishing tools that threaten marine resource sustainability. In addition to fisher and tourism group empowerment, the Environmental Agency promotes environmental and disaster awareness through targeted programs. Social learning encompassing knowledge, education, and technology is a key principle of social systems. According to the Batukaras Report (2019), the distribution of fishing gear in the area reflects a dominance of traditional methods, line fishing is the most widely used, with approximately 7.000 units, followed by nets totaling 68 units, and seine nets with 22 units, additionally aquaculture-based tools such as ponds and fish cages account for 8 and 6 units, respectively, this composition suggests a reliance on small-scale and artisanal fishing practices.

"There are indeed conservation efforts in place, including the protection of juvenile fish, sharks, and lobsters, which are listed on public awareness

posters as prohibited species from being captured and sold to the Fish Landing Base due to their protected status. Mangrove management, however, remains under the authority of the village government, and infrastructure development, particularly bridge construction, remains a challenge" (Ganjar, Coordinator of the Coastal Fishery Port, Batukaras Village, interview April 3, 2023)

Regulations on fishing practices in Batukaras, from national to village level, promote the use of eco-friendly, non-destructive gear aligned with sustainable marine capture principles. A mandatory reporting system for fish catches has been implemented at the Fish Landing Bases of Batukaras and Nusawiru to support direct fishers-to-buyers transactions. Conservation measures are also in place, including the protection of juvenile fish, sharks, and lobsters, which are listed on public awareness posters as prohibited from capture and trade. While mangrove management remains under village authority, infrastructure constraints, such as incomplete bridge construction, continue to limit conservation and access efforts. The proposed framework has the potential to enhance the capacity of decision-makers engaged in local coastal governance to more effectively manage for social-ecological resilience (Fallon et al., 2022). This study by Sjafrie (2018) demonstrates that interactions among ecological resources, resource users, and public infrastructure providers generate an interconnected pattern of utilization within the seagrass-based socio-ecological system. Consequently, ecological disturbances have direct and cascading effects on the socio-economic conditions of coastal communities, underscoring the need for integrated and adaptive management approaches.

Protection of Marine Landscape Ecosystems and Biodiversity

1. Awareness in Building the Capacity of Tourism Stakeholder Groups

"Since the mangrove bridge was damaged, there has been no further action either from the government or the local community, so the initiative has not continued. Occasionally, if there are university students conducting community service, I accompany them to the mangrove forest. However, there is still no formal management in place, only sporadic maintenance or monitoring efforts. At present, the bridge is no longer functional, and we are unable to maintain it, neither the government nor the community is able to intervene. It is a dilemma, and I am uncertain about the solution" (Dede, Mangrove Forest Guardian of Batukaras, interview April 9, 2023)

The damage to the mangrove bridge in Batukaras has led to a complete halt in conservation and management activities. Neither the government nor the local community has taken further action, resulting in the discontinuation of previous initiatives. Limited engagement only occurs during Student Community Service Programs, yet no formal management system is in place. Currently, the bridge is non-functional, and neither party possesses the capacity to undertake repairs. This situation reflects a governance dilemma and highlights the lack of institutional response to damaged ecosystem infrastructure. The importance of participatory approaches and local knowledge is crucial for enhancing landscape resilience, as it fosters the strengthening of socio-ecological systems through cross-sectoral planning and community collaboration with policymakers (Aydin et al., 2018)

2. Building Capacity to Respond to Environmental Challenges

"The Batukaras Surfing Club is a hobby-based community organization committed to environmental conservation efforts. At the regency level, there is the Regional Disaster Management Agency, which focuses more on mangrove-related mitigation" (Hadi Somantri, Head of Batukaras Village, interview April 1, 2023)

"Waste is inevitably present. There are several waste collection systems, including the use of waste seminator vehicles and public bins, although their effectiveness remains limited. Waste management is a concern, especially regarding the number and adequacy of available waste facilities. Waste generated from tourism activities is particularly challenging, given the limited number of waste transport vehicles. I hope the 3R-based waste management system (Reduce, Reuse, Recycle) can be improved" (Tourism Awareness Group, Batukaras Village, interview April 3, 2023)

Community-based and institutional responses to environmental management in Batukaras demonstrate both initiative and limitation. The Batukaras Surfing Club, rooted in recreational interests, plays an active role in local conservation efforts, while at the institutional level, the Regional Disaster Management Agency contributes primarily through mangrove-related mitigation strategies. However, environmental challenges persist, particularly in waste management. Despite the existence of waste collection systems such as public bins and waste seminator vehicles, their coverage and effectiveness are insufficient, especially during peak tourism periods. The inadequacy of waste transport facilities hinders sustainable practices, prompting local stakeholders to advocate for the enhancement of a 3R (Reduce, Reuse, Recycle) based management approach. The landscape or seascape is supported by capable, accountable, and transparent local institutions that play a crucial role in ensuring effective and participatory governance (ANU IAS, 2014). Sustainable local-based solutions and resilience enhancement strategies are essential, as those presented benefit local communities, policymakers, practitioners, researchers, and a broader audience (Nishi & Hashimoto, 2022). The dynamic interaction between natural systems and human activities characterizes coastal diversity, making integrated and adaptive management essential to ensure ecological sustainability and socio-economic resilience (Virapongse & Alessa, 2016)

Diversity of Coastal Resource Potentials

1. Enhancing Livelihood Products Based on Biodiversity

"There are several similar products, such as coconuts and coffee for consumption, which are sold to tourists that utilize the available natural resources by the local community. What's most needed now are training programs for micro, small, and medium enterprises, as well as improved infrastructure, particularly in the tourism sector. So far, progress has been gradual, supported mainly by the local government and the community's own awareness" (Somantri, Head of Batukaras Village, interview April 1, 2023)

"There are cooperatives such as Village Unit Cooperatives or joint business groups supported by the village cooperative system. Occasionally, the local government also participates or provides assistance. The management of capture fisheries includes the establishment of Village Unit Cooperatives for fishers, with their catch sold to restaurants in the Batukaras tourism area" (Ganjar, Coordinator of the Coastal Fishery Port, Batukaras Village, interview April 3, 2023)

Local economic activities in Batukaras demonstrate a strong reliance on natural resource utilization and community-based enterprise. Coconut Products, Coffee, and Seafood are commonly marketed to tourists, reflecting the integration of environmental assets into the village's informal economy. The development of Micro, Small, and Medium Enterprises remains gradual, driven primarily by local awareness and limited support from the local government. Institutional frameworks, such as Village Unit Cooperatives and joint business groups, play a role in facilitating Small-Scale Entrepreneurship. In the fisheries sector, MSMEs enable fishers to supply local tourism-related businesses, although challenges persist in terms of capacity-building, infrastructure, and broader market integration. Based on data provided by Statistics Indonesia in Pangandaran Regency (2023), the main estate crops cultivated include coconut and coffee; in total,

coconut production reached 3,92 million coconuts over a planted area of 400 hectares; meanwhile, coffee production amounted to 1,880 kilograms, cultivated on a relatively smaller area of 2 hectares. Strengthening training programs and improving infrastructure are identified as key priorities for sustainable economic growth. The socio-economic infrastructure in the area is considered sufficient to support the daily activities and well-being of the community (ANU IAS, 2014).

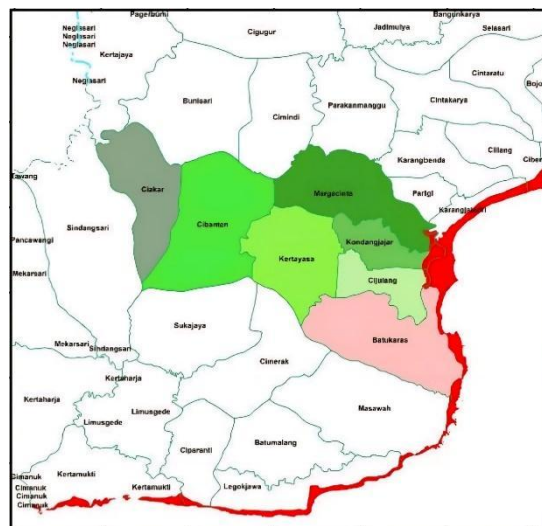
2. Efforts to Diversify Livelihoods Beyond Marine Resource Utilization

"Regarding coastal livelihoods, a significant number of residents have transitioned to rice cultivation, utilizing both privately owned plots and land owned by others. Informal cultivation also occurs on parcels that remain undeveloped. This pattern is evident in Sanghiangkalang Hamlet, located near Bojong Salawe" (Maman, The Village Community Empowerment Agency, interview April 6, 2023)

Coastal communities in Batukaras have increasingly turned to rice farming, utilizing both owned and informally accessed land to support food security. In Sanghiangkalang, unused private land has been cultivated by residents, reflecting a community-driven adaptation to livelihood challenges. Livelihood improvements within landscapes and seascapes are closely associated with the innovative and sustainable utilization of local biodiversity, which supports both economic development and ecosystem conservation (ANU IAS, 2014). The indicators hold significant importance for local communities and for the conservation of biodiversity managed by them for their livelihoods (Cockburn et al., 2020).

3. Safety Measures for Coastal and Marine Tourism Activities

"It has been quite good from the cadre formation process to the establishment of the Community Early Awareness Forum. It has been implemented. The village was ready; the forum was established in 2019. Approximately once a year, there is training focused on disaster preparedness and early warning" (Maman, The Village Community Empowerment Agency, interview April 6, 2023)



(Source: Processed by Putra, 2023)

Figure 5. The Tsunami Hazard Map (red line) from Indonesia Geospacial

Batukaras Village has demonstrated preparedness through the establishment of the Community Early Awareness Forum in 2019. Supported by regular annual training on disaster preparedness and early warning, the forum reflects structured community-based risk reduction efforts from cadre formation to institutional implementation. (see **Figure 5**) shows the tsunami hazard map with red lines indicating high-risk zones,

primarily in coastal lowlands and gently sloping terrains, based on topographic features and processed using data from Indonesia Geospatial. The community possesses the capacity to relocate in response to shifting production opportunities, thereby avoiding land degradation and unsustainable resource exploitation (ANU IAS, 2014). Vulnerability assessments are applied in coastal communities reliant on tourism emphasis on water and socio-economic impacts, and the need for locally-informed case studies in small coastal communities (Ngo et al., 2022; Lawyer et al., 2023). Coastal ecosystems provide critical protection functions, including shoreline stabilization, wave attenuation, and buffering against storm surges and coastal erosion, thereby reducing vulnerability of coastal communities to environmental hazards (Sjafrie, 2018).

Conclusion

This study reveals that both climate change and socio-cultural dynamics significantly affect the condition of coastal tourism in Batukaras Village. The degradation of environmental quality in beach and mangrove areas, coupled with insufficient infrastructure and limited accessibility, illustrates the region's vulnerability. Nevertheless, local communities exhibit socio-ecological resilience through self-managed waste practices, the development of community-based educational tourism, and strategic collaborations with academic and governmental institutions for disaster mitigation. To strengthen adaptive capacity, structured policy frameworks and strategic interventions are required. Key implications include: (1) the formulation of climate adaptation policies and spatial regulation for fishing boat mooring zones; (2) enhanced coordination in managing waste and related infrastructure; (3) improvement of tourism access and facilities; (4) multi-stakeholder consolidation to support ecosystem conservation; and (5) advancement of disaster preparedness through education, evacuation planning, and innovative coastal protection technologies. The findings indicate that governance and institutional coordination emerge as relatively strong SER dimensions, whereas ecological management capacity and community-based environmental monitoring remain comparatively weak. These weaker indicators should therefore be prioritized in future policy interventions, particularly through strengthening local adaptive capacity, participatory ecosystem management, and cross-sectoral collaboration to enhance overall socio-ecological resilience.

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Community-Based Participatory Mapping for Tourism Development in Tuwed Village, Bali

I Nyoman Meirejeki^{1*}, I Putu Mertha Astawa², Ni Ketut Pradani Gayatri Sarja³, I Ketut Suarta⁴, I Komang Mahayana Putra⁵, I Made Rony Mulia Kusuma Putra⁶

^{1,4,6}Tourism Department, Politeknik Negeri Bali, Bali, Indonesia

²Accounting Department, Politeknik Negeri Bali, Bali, Indonesia

³Information Technology Department, Politeknik Negeri Bali, Bali, Indonesia

⁵Business Administration Department, Politeknik Negeri Bali, Bali, Indonesia

*Corresponding Author: nyomanmeirejeki@pnb.ac.id

Abstract: Tuwed Village, located in Melaya, Jembrana, Bali, has rich natural and cultural resources with strong potential for sustainable tourism development. However, it has not yet been officially designated as a tourism village. Based on interviews with local community leaders, Tuwed Village holds various tourism potentials, such as a mangrove forest that serves as a habitat for diverse biota and a forest area that functions as a birdwatching site with various bird species that attract tourists. In addition, the village has agricultural potential, including extensive rice fields, cocoa, and avocado plantations. Tuwed Village offers unique local traditions, such as the traditional buffalo racing, which is distinctive and promising to be developed as part of cultural tourism. Despite these strengths, tourism development in Tuwed Village remains underutilized due to the absence of structured, data-driven zoning and spatial planning, and limited community involvement. This research aims to identify and mapping the tourism potential in Tuwed Village through direct community participation. The research methods include identifying existing potentials by engaging directly with the local community, conducting focus group discussions to plan the mapping process and developing a digital map using Geographic Information System. This research result is a tourism potential map that can be utilized by the Tuwed Village management for the sustainable development of the village towards becoming a tourism destination. Furthermore, involving the community in the mapping process enhances the spatial data accuracy, strengthens social capacity, and fosters sense of ownership, consequently, it becomes a strategic instrument for strengthening community-driven tourism initiatives.

Keywords: community participation, potential mapping, tourism potential, Tuwed village.

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Introduction

The tourism industry has huge potential improve economic sector including rural tourism (Rodrigues et al., 2023) (Kitole & Sesabo, 2024) (Li et al., 2025). Rural tourism denotes tourism practices situated in rural settings, characterised by visitor involvement in locally embedded activities such as agriculture, nature-based experiences, indigenous traditions, and social interaction with host communities (Soták-Benedeková et al., 2025). The expansion of tourism activities in rural settings is frequently viewed as a catalyst for regenerating the social, cultural, and economic foundations of long-established village settlements (Reina-Usuga et al., 2024) (Hussain et al., 2024). While it holds considerable potential to enhance the quality of life of local communities, it may simultaneously threaten their livelihood systems, weaken long-standing cultural practices, fracture social

cohesion within the village, and, in extreme circumstances, lead to the displacement of established traditional settlements (Yanan et al., 2024). Evaluating the acceptability of tourism development requires a careful examination of community perceptions toward industry expansion, as, despite its capacity to stimulate employment, increase income generation, enhance living standards, upgrade infrastructure, and attract external investment, local residents may still respond with scepticism or resistance (Khasawneh et al., 2023). Numerous scholars acknowledge that active involvement of local communities constitutes a fundamental prerequisite for ensuring the long-term sustainability of tourism destinations (Idris et al., 2021) (Obradović & Stojanović, 2022) (Mmeko et al., 2023). They argue that actively involving local residents helps to enhance the benefits of tourism development while reducing its potential adverse impacts (Boonsiritomachai & Phonthanakitithaworn, 2019). Community-based tourism is widely regarded as a practical approach to community empowerment, based on the expectation that active participation of local residents in tourism activities can generate economic opportunities and sustainable livelihoods, while simultaneously fostering a commitment to environmental protection (Burton et al., 2025) (Aunchistha, 2025).

Tuwed Village is situated in Melaya Sub-district within Jembrana Regency, Bali Province. The village holds a strategically significant position and is endowed with a wide range of economic potentials, particularly in the sectors of agriculture, plantations, farm, and small and medium-sized enterprises (SMEs). Across the farming sector, Tuwed has extensive rice fields, with rice being the primary crop. In addition to agriculture, the plantation sector is also highly prominent, with the cultivation of coconut, cocoa, and coffee being the dominant commodities. Farming also significantly contributes to the village's economy, with cattle, pigs, goats, and poultry being the dominant types. Beyond its economic resources, Tuwed Village is also rich in natural and cultural tourism assets that remain largely underdeveloped but show great potential. According to interviews with local community leaders, the village is home to ecotourism attractions such as mangrove forests that serve as essential ecological habitats for diverse plant and animal species, including both migratory and endemic birds. Mangrove ecosystems function as natural buffers along coastlines, foster rich biological diversity, generate environmentally sustainable livelihood options, and contribute to the economic resilience of surrounding communities (Malik et al., 2025). These areas have the potential to be developed into birdwatching destinations, which could attract nature-based tourism enthusiasts. Additionally, the presence of forested zones around the village adds to its ecological appeal, offering opportunities for hiking, biodiversity observation, and environmental education. From a socio-cultural perspective, Tuwed Village maintains a strong cultural heritage, marked by traditional practices and rituals that are still actively observed by the local population. One of the most unique and culturally significant traditions is the buffalo racing, which is not only a community festivity but also a potential cultural tourism attraction due to its uniqueness and local wisdom (Yogantara et al., 2024) (Sarka, 2025).

Despite the abundance of natural beauty and cultural heritage, Tuwed Village has not yet been formally recognized or designated as an official tourist village. This condition stems from the suboptimal governance and underutilisation of the village's existing tourism assets. In addition, the village has yet to develop a structured, data-driven zoning map of its tourism assets that actively involves community participation in the planning process. Existing tourism asset identification remains largely descriptive and fragmented, resulting in limited information for evidence-based decision-making related to tourism zoning, infrastructure planning, environmental conservation, and tourism investment prioritisation. This situation creates a clear urgency: without a systematic,

spatially explicit, and community-engaged inventory, Tuwed Village risks either missing economic opportunities or experiencing unplanned tourism growth that may lead to environmental degradation, land-use conflicts, and social tensions within the local community. Furthermore, the village has not yet established a participatory spatial database that integrates tourism potential, environmental conditions, accessibility, and community perspectives into a unified tourism planning framework.

Research focusing on community engagement in the process of village development has been carried out by (Mteti et al., 2025) which explores the interrelationship between local residents' awareness and perceptions and the potential of cultural heritage resources (CHRs) in the Katavi Region, located within Tanzania's southern tourism circuit. The study underscores the pivotal importance of active community participation in positioning Katavi as an emerging cultural tourism destination. It further emphasises that meaningful community participation in tourism planning is essential for safeguarding local interests and cultural heritage, while cultivating a strong sense of ownership and pride among residents. Another study conducted by (Alamineh et al., 2023) found that community views were generally supportive, as residents recognised tourism as contributing positively to the expansion and enhancement of social services in the destination area. Research by (Mir et al., 2024) stated that sustainable development in rural and regional areas depends largely on informed and proactive community involvement in tourism-related activities. Research related to Geographic Information System (GIS) implementation development has been carried out by (Salminen et al., 2025) investigated the application of Geographic Information Systems (GIS) by employing an online Public Participation GIS (PPGIS) platform to map and analyse areas of concern linked to the rapid growth of the aquaculture and tourism industries in Northern Norway. With a participation level of 9.4%, the findings indicate that most mapped spatial issues were located near aquaculture sites and tourism zones. Respondents largely supported scaling back salmon aquaculture, while maintaining neutral views toward other aquaculture activities. In addition, attitudes toward tourist fishing and cruise tourism were either neutral or inclined toward reduction, whereas perceptions of other coastal tourism activities were comparatively more favourable. Research by (Hognogi et al., 2025) state that PPGIS serves as an effective mechanism for integrating citizen involvement with environmental conservation efforts, while also enhancing cultural ecosystem services.

However, previous research primarily focused on community perceptions or participatory mapping separately, while limited research integrates community participation with data-driven GIS-based tourism zoning specifically for rural tourism planning at the village level. Most previous studies also emphasised qualitative participation without providing a replicable and verifiable spatial decision-support framework. Therefore, the urgency and novelty of this research lie not merely in producing a tourism map or simple tagging of tourism locations, but in developing a participatory and data-driven digital spatial database that can support evidence-based tourism planning and sustainable village development. The core value of this paper is that it moves beyond simply identifying tourism points of interest by integrating spatial information, tourism potential classification, environmental characteristics, accessibility, land-use conditions, and community knowledge into a GIS-based digital mapping system. This approach produces spatially accurate and attribute-rich data layers that can support strategic tourism zoning, conservation planning, tourism route development, infrastructure prioritisation, and sustainable tourism governance (Abdullah et al., 2025) (Cxinar et al., 2025). In addition, the research generates measurable outputs such as zone classifications, spatial overlays, and participatory mapping results, thereby

providing verifiable and updatable tourism planning data rather than subjective descriptive inventories. Thus, this research addresses the gap between rhetorical community participation and actual spatial decision support for rural tourism planning.

To overcome the identified issues, namely the absence of a structured, data-driven, and community-engaged tourism planning framework, this research developed a village potential digital map that can be used by Tuwed Village managers in the sustainable development of Tuwed Village towards a tourist village using GIS. In contrast to previous studies that rely mainly on generic surveys or simple location tagging, this research adopts a data-driven PPGIS approach by integrating participatory tourism asset mapping, GPS-based field data collection, and spatial analyses such as proximity, overlay, and density analysis to produce verifiable and updatable spatial map layers. Mapping applications based on GIS technology allow users to alternate among multiple base layers, including satellite views and marine charts, enabling diverse stakeholders to gain clearer insight into the designated area (James, 2025). This research result is a tourism potential map that can be utilized by the Tuwed Village management for the sustainable development of the village towards becoming a tourism destination. Furthermore, involving the community in the mapping process enhances the spatial data accuracy, strengthens social capacity, and fosters a sense of ownership, making it an effective strategy for community-based tourism planning and development. The unique value of this paper lies in demonstrating how a data-driven PPGIS framework can transform local community knowledge into actionable spatial information for sustainable tourism planning. Consequently, this research contributes not only academically through the integration of participatory GIS and community-based tourism planning, but also practically by providing a replicable spatial decision-support model for rural villages facing similar tourism development challenges.

Methodology

This section outlines the stages of the research to be conducted. The research methodology problem identification includes identifying existing potentials by engaging directly with the local community, literature review, data collection by doing focus group discussions to plan the mapping process and developing a digital map using Geographic Information System. The stages carried out in this research are illustrated in Figure 1.

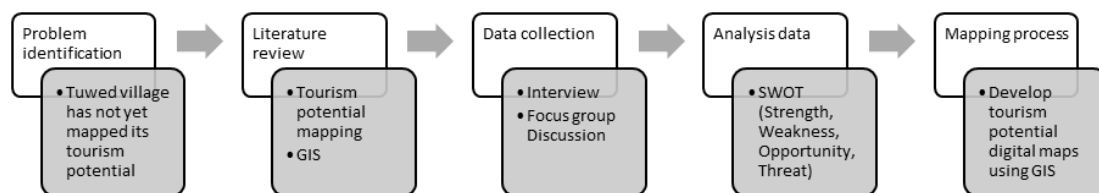


Figure 1. Research Methodology

Figure 1 illustrates the research stages which are explained as follows:

1. **Problem identification**
At this stage, the existing problems are identified. Tuwed Village possesses considerable tourism potential, both cultural and natural. However, to date, there has been no development master plan or mapping of the village's potential to support sustainable development initiatives.
2. **Literature review**

At this stage, a literature review is conducted on village potential mapping and the GIS application to support this research.

3. Data collection

At this stage, data is collected using two methods: interviews with village administrators and focus group discussions with local leaders and community representatives. For the interviews, a total of 7 representatives from the village administration were purposively selected based on their direct involvement in village planning, tourism development, land management, and community empowerment activities. The participants included the Village Head, Village Secretary, representatives from village development and community empowerment divisions, as well as representatives from the Village-Owned Enterprise (BUMDes). These participants were selected because they possess strategic knowledge and decision-making roles related to village development planning, tourism potential management, and community-based economic programs in Tuwed Village. For the focus group discussions (FGDs), a total of 20 participants were involved and divided into two discussion groups. Participants were selected using purposive sampling combined with snowball sampling to ensure representation from key community stakeholder groups with direct knowledge of local tourism potential and environmental resources. The participants consisted of representatives from farmer groups, mangrove management groups, BUMDes, village cooperatives, youth organisations, customary village leaders, women's community groups, and general village community representatives. Specifically, the FGD participants included: 5 representatives from agricultural and plantation groups (rice, coconut, cocoa, and coffee sectors), 3 representatives from livestock groups, 3 representatives from mangrove conservation and management groups, 2 representatives from BUMDes and village cooperatives, 3 youth organisation representatives including tourism awareness groups, 2 customary and cultural leaders, and 2 representatives from women's and local community groups involved in SME activities. The participant selection criteria required that individuals were actively involved in social, environmental, cultural, or economic activities within the village, possessed adequate knowledge regarding local tourism assets such as mangrove ecosystems, forest areas, agricultural landscapes, and buffalo racing traditions, and were willing to participate in participatory spatial mapping activities and group discussions. The diversity of participants ensured that ecological, agricultural, cultural, social, and economic perspectives were comprehensively integrated into the data-driven GIS and participatory mapping process.

4. Analysis data

At this stage, the gathered data are systematically evaluated using the SWOT (Strengths, Weaknesses, Opportunities, and Threats) analytical framework.

5. Mapping process

At this stage, the mapping of tourism potential in Tuwed Village is carried out using Geographic Information Systems (GIS). The mapping process involved several stages, including field data collection, spatial data validation, digitisation, and spatial analysis. Field data regarding tourism assets, environmental features, accessibility, and cultural sites were collected through direct observations, participatory discussions, and GPS-based location recording using mobile mapping applications. The collected spatial data were then processed and analysed using QGIS software as the primary GIS platform. Several spatial analysis techniques were applied, including overlay analysis, proximity analysis, and tourism potential

zoning. Satellite imagery and OpenStreetMap base maps were utilised to identify land use, road accessibility, mangrove areas, agricultural landscapes, forest zones, and tourism attraction distribution. In addition, participatory mapping activities were conducted by involving local stakeholders in validating tourism locations and spatial boundaries to ensure the accuracy and relevance of the generated spatial information. The final output of the mapping process was a digital tourism potential map containing multiple spatial information layers, including tourism attraction points, environmental conservation areas, accessibility routes, agricultural and cultural tourism zones, and supporting village infrastructure. This GIS-based mapping process enabled the development of a structured, verifiable, and updatable spatial database to support sustainable tourism planning and decision-making in Tuwed Village.

Results and discussions

Results

During the initial data collection stage using interviews with village officials, several tourism potentials in Tuwed Village were identified, consisting of both natural and cultural assets. One of the prominent natural potentials is the mangrove forest, while a notable cultural tradition is Mekepong, a traditional buffalo racing event unique to Tuwed Village. Subsequently, additional data were obtained through a Focus Group Discussion (FGD) conducted with village authorities and key community representatives. The FGD was conducted to elicit views and recommendations from local stakeholders concerning tourism development in Tuwed Village. The participation of community leaders generated substantial insights into various local assets that could be strategically leveraged for tourism development. The FGD subsequently resulted in the classification of Tuwed Village's principal tourism potentials, as presented in Table 1.

Table 1. Tuwed Village's Main Tourism Potentials

Type of Tourism	Tourism Potential	Potential Activities/Schedule
Conservation, Ecotourism, and Education Areas	Mangrove forests and turtle habitats	Mangrove trekking, birdwatching, turtle observation, mangrove planting, environmental education (year-round; turtle observation during nesting season)
Agrotourism	Rice harvesting, coconut farming, and local vegetable cultivation	Rice planting and harvesting experiences, plantation tours, agricultural education (harvesting season: 2–3 times/year)
Cultural Tourism	Mekepong (buffalo racing), culinary traditions, and handicrafts	Mekepong festivals, culinary experiences, handicraft workshops (conducted during local festivals and cultural events)
Ecotourism	Biodiversity and coastal landscapes	Nature photography, biodiversity observation, coastal tours, conservation campaigns (year-round)

Source: Authors' elaboration based on focus group discussion (FGD) results (2025)

The tourism potentials identified through focus group discussions (FGDs) indicate that Tuwed Village possesses diverse attractions that can support sustainable tourism development. The mangrove forests and turtle habitats offer significant opportunities for conservation-based ecotourism and environmental education. According to stakeholders, potential activities in this area include mangrove trekking, birdwatching, turtle habitat observation, environmental interpretation, and mangrove planting programs involving

visitors and students. These activities can be conducted throughout the year, while turtle observation activities are recommended during nesting seasons to minimize disturbances to wildlife.

Agrotourism in Tuwed Village is primarily associated with rice fields, coconut plantations, and local vegetable cultivation. Visitors may participate directly in farming activities, such as rice planting and harvesting, coconut processing demonstrations, and educational tours related to sustainable agricultural practices. Based on information provided by local farmers, rice harvesting activities generally occur two to three times annually, depending on seasonal conditions, whereas plantation activities can be visited throughout the year.

Cultural tourism in Tuwed Village is represented by Mekepong (traditional buffalo racing), local culinary traditions, and handicraft production. Mekepong is recognized by stakeholders as one of the village's most distinctive cultural attractions and is usually organized during particular ceremonial periods or local festivals. In addition, visitors may experience traditional culinary preparation, local food tasting, and observe or participate in handicraft-making activities conducted by community members.

The village's biodiversity and coastal landscapes also provide opportunities for ecotourism development. Stakeholders suggested several potential activities, including biodiversity observation, nature photography, coastal interpretation tours, educational excursions, and environmental conservation campaigns. These activities are generally feasible throughout the year, particularly during favorable weather conditions.

Following the identification of Tuwed Village's key tourism potentials during the data collection phase, the information was further examined using the SWOT framework to evaluate its strengths, weaknesses, opportunities, and threats. The findings of this assessment were then utilised as a basis for establishing tourism zoning, which was subsequently visualised in a digital map, as presented in Table 2.

Table 2. SWOT Analysis

Strengths	Weaknesses	Opportunities	Challenges
Diverse tourism potential: mangrove, protected areas (home range) for endangered wildlife such as turtles, and local handicrafts.	Inadequate accessibility	Regulatory support: spatial planning (RTRW), mangrove conservation, BRIDA	Mangrove forest management status
Rich local culture and community-based conservation wisdom	Limited supporting facilities	Increasing trends in educational and sustainable tourism	Coastal abrasion threats and damage to coastal ecosystems
Strategic location with sufficient road access – TNBB (West Bali National Park)	Lack of supporting creative industries	Partnership opportunities	Potential land use conflicts with other sectors
Active local community participation	Lack of Master Plan and Governance System		

Source: Authors' elaboration based on focus group discussion (FGD) results (2025)

Discussions

Based on interviews with village officials and focus group discussions (FGDs) with community leaders, several tourism potentials were identified in Tuwed Village. The involvement of community leaders played a crucial role in uncovering village potentials

that are considered suitable for sustainable tourism development. To support future village planning and development, these tourism assets were subsequently mapped digitally using GIS. The digital representation of Tuwed Village’s tourism map is displayed in Figure 2.

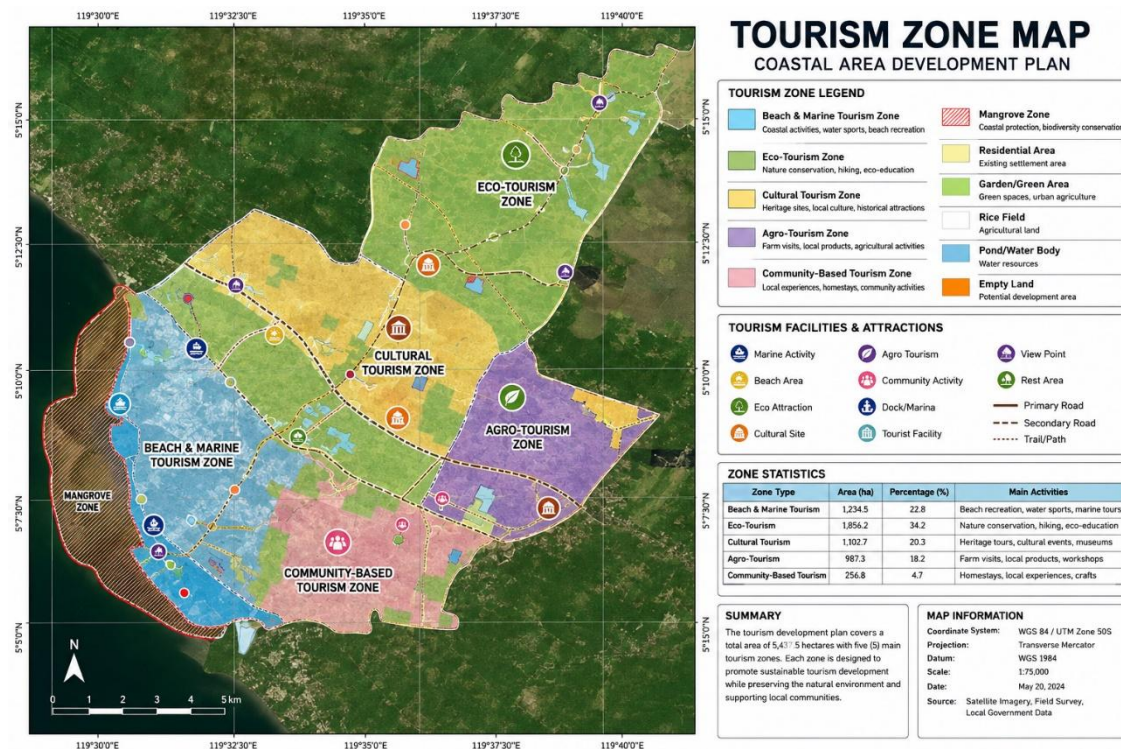


Figure 2. Tuwed Village Digital Map
Source: Processed by researchers (2025)

In Figure 2 can be seen that Tuwed Village has the potential of a mangrove forest area with an area of 67 Ha, residential areas, gardens consisting of cocoa and avocado gardens, rice fields with abundant water considering that Tuwed Village is located in the lowlands near the beach, several ponds and there is a little empty land visible. The digital map of Tuwed Village reveals several areas that can be categorized into specific tourism zones. The tourism zone map illustrates the spatial distribution of tourism development areas based on the natural, agricultural, and socio-cultural resources of the coastal region. The proposed tourism development is divided into four main tourism categories, namely conservation, ecotourism and education areas, agrotourism, cultural tourism, and ecotourism, each representing specific tourism potentials and activities.

The Conservation, Ecotourism, and Education Area is located primarily within the coastal mangrove ecosystem and turtle habitat zones along the western coastline. This area is designated for environmentally sustainable tourism activities, including mangrove trekking, birdwatching, turtle observation, mangrove planting programs, and environmental education. These activities can be conducted throughout the year, while turtle observation is recommended during the nesting season to minimize ecological disturbance.

The Agrotourism Zone, situated in areas dominated by rice fields, coconut plantations, and local vegetable cultivation, offers opportunities for agricultural-based tourism. Visitors can participate in rice planting and harvesting experiences, plantation

tours, and agricultural education programs. Seasonal activities are concentrated during harvesting periods, which generally occur two to three times annually.

The Cultural Tourism Zone is developed in areas with strong local cultural characteristics and community activities. This zone promotes traditional attractions such as *Mekepong* (buffalo racing), local culinary experiences, and handicraft production. Tourism activities include cultural festivals, culinary tourism, and handicraft workshops, which are primarily organized during local cultural events and festival periods.

The Ecotourism Zone encompasses areas with high biodiversity value and attractive coastal landscapes. This zone supports nature-based tourism activities such as nature photography, biodiversity observation, coastal exploration tours, and conservation campaigns. These activities are designed to operate throughout the year while maintaining ecosystem integrity and promoting environmental awareness among visitors. The classification of tourism zones in Tuwed Village is presented in Table 3.

Table 3. Tuwed Village Tourism Zone

Zone	Function	Location
Conservation	Mangroves & turtle protection	Coastal area
Edu-tourism	Agriculture, training	Village center
Culture & Culinary	Cultural attractions and MSMEs	Community hall
Accommodation & Services	Homestays & supporting facilities	Main road
Thematic Events	Festivals, training sessions	Open field

Source: Authors' elaboration based on focus group discussion (FGD) results (2025)

Table 3 shows Tuwed Village tourism zone where it intended to regulate spatial utilization in a responsible manner, ensuring that tourism activities are carried out sustainably, safely, and in a controlled way without causing harm to the environment or compromising local cultural values. Through proper zoning, visitors can appreciate the village's natural beauty and cultural uniqueness while minimizing the risk of environmental degradation resulting from tourism (Skiniti et al., 2024) (Salciccia-frezza et al., 2025). Moreover, the implementation of tourism zoning is essential for safeguarding the destination's local identity and cultural heritage.

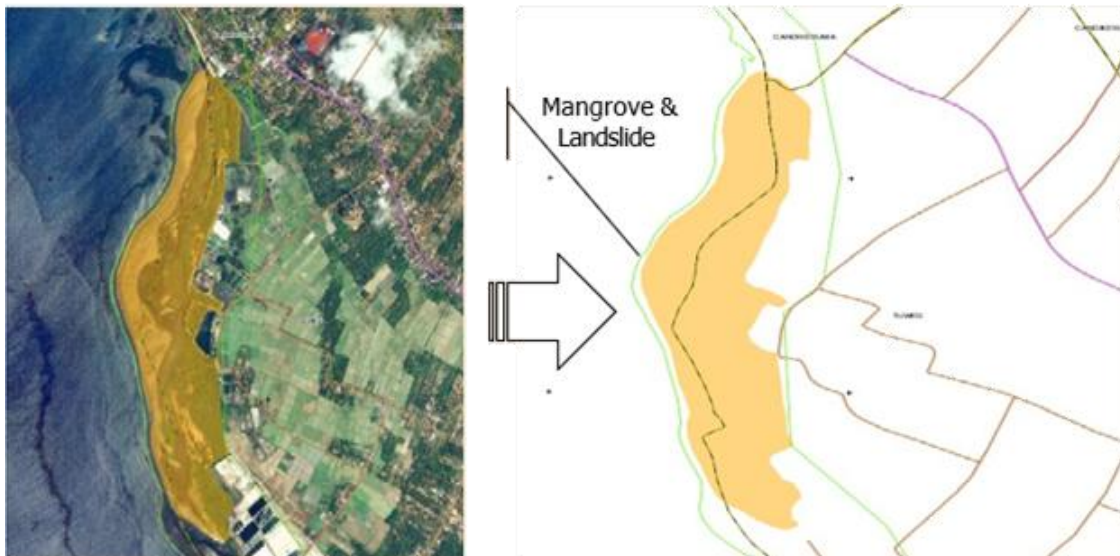


Figure 3. Tuwed Village Digital Map
Source: Processed by researchers (2025)

Figure 3 presents a digital map generated using Geographic Information Systems (GIS), highlighting the mangrove forest area in Tuwed Village. Among the identified tourism potentials, the mangrove forest has been selected as the central area for tourism development in the village, highlighting edu-tourism as its principal attraction. This site is intended to function both as a recreational destination and as an educational platform to promote awareness of environmental conservation and the sustainable management of natural resources.

The emphasis on mangrove ecosystems as a core ecotourism asset in Tuwed Village is consistent with evidence provided by (Malik et al., 2025), who showed that such environments offer sustainable economic opportunities for local populations while supporting ecological resilience. Additionally, the zoning categories established for this village—covering conservation, educational tourism, cultural activities, accommodations, and special events—mirror the sustainable destination management principles advocated by (Reina-Usuga et al., 2024), particularly regarding the importance of cooperative governance and perceived community value.

With respect to methodology, the participatory mapping strategy adopted here aligns closely with the PPGIS framework described by (Hognogi et al., 2025), which facilitates the integration of local input into environmental management and cultural ecosystem services. Likewise, (Salminen et al., 2025) found that PPGIS can successfully identify spatial concerns associated with tourism expansion, offering a basis for evidence-based coastal management. In Tuwed Village, this participatory process enabled residents to confirm the locations and boundaries of tourism assets, ensuring that the final digital map accurately represents local knowledge rather than external prescriptions.

The instrumental role of community leaders in recognizing viable tourism resources supports the conclusions of (Mteti et al., 2025), who argued that genuine community engagement in tourism planning helps protect local heritage and fosters a collective sense of responsibility and pride. Furthermore, the discovery of both natural attractions (mangroves, biodiversity) and cultural assets (Mekepung buffalo racing, local cuisine) in Tuwed Village reinforces the broader characterization of rural tourism by (Soták-Benedeková et al., 2025), which highlights visitor participation in agriculture, nature-based activities, indigenous customs, and social interactions with residents.

From a theoretical standpoint, the zoning framework implemented in this study can be interpreted through community-based tourism (CBT) theory. As noted by (Burton et al., 2025) and (Aunchistha, 2025), CBT represents a widely recognized pathway for community empowerment, founded on the premise that local engagement in tourism generates economic benefits and sustainable livelihoods while encouraging environmental stewardship. The five designated zones in Tuwed Village operationalize this theory by allocating specific areas for distinct forms of community participation, ranging from mangrove preservation to cultural performances and homestay operations.

The SWOT analysis summarized in Table 2 indicates that Tuwed Village possesses considerable tourism potential (strengths) but continues to struggle with poor accessibility, insufficient facilities, and the lack of a formal master plan or governance structure (weaknesses). These observations are comparable to those reported by (Khasawneh et al., 2023) in rural Jordanian destinations, where residents exhibited skepticism toward tourism development despite its potential to create jobs and raise incomes. In the case of Tuwed Village, the absence of systematic, spatially explicit zoning has constrained tourism growth, confirming the assertion by (Mir et al., 2024) that rural sustainability depends heavily on informed and proactive community participation in tourism-related decisions.

The digital map produced in this research directly addresses the deficiency identified by (Idris et al., 2021) and (Obradović & Stojanović, 2022), both of whom emphasized that local community involvement is a fundamental condition for long-term tourism destination sustainability. By combining GPS-based field data collection, participatory validation, and GIS-based spatial analysis, this study goes beyond simple point-of-interest tagging to generate a verifiable, updatable, and data-informed spatial database. This approach responds to the warning by (Boonsiritomachai & Phonthanukitithaworn, 2019) that active resident involvement enhances the benefits of tourism development while mitigating potential negative consequences, including environmental harm, land-use disputes, and social friction.

In conclusion, the experience of Tuwed Village demonstrates that participatory GIS mapping, when grounded in CBT principles and supported by spatial analytical techniques, can effectively convert local knowledge into actionable geographic information for sustainable tourism planning. This study provides empirical validation of the PPGIS framework in a rural Balinese setting, showing that community-driven spatial data collection and zoning classification can underpin informed decision-making for tourism development while preserving local cultural and environmental assets. The alignment between the Tuwed Village case and earlier research (Mteti et al., 2025), (Alamineh et al., 2023), (Salminen et al., 2025), (Hognogi et al., 2025) confirms that participatory mapping is not merely a technical exercise but rather a social process that builds community capacity, nurtures ownership, and enhances the credibility and applicability of tourism planning outcomes.

Conclusions

Tuwed Village holds significant and diverse tourism potentials, encompassing both natural and cultural assets. However, the lack of structured zoning and spatial planning has hindered optimal tourism development. Through participatory methods and the application of GIS technology, this research successfully identified and mapped tourism asset that can guide the village's transition toward becoming a sustainable tourism destination. The digital tourism map produced serves as a strategic planning tool for village authorities, enabling informed decision-making and long-term development. Importantly, the involvement of local community leaders played a critical role in the research process. Their insights and local knowledge significantly enriched the identification of village potentials and contributed to shaping a more context-specific and sustainable tourism development plan. Their engagement not only enhanced the reliability of the collected data but also promoted a sense of community ownership, ensuring that tourism development initiatives reflect local values and priorities. These findings affirm that participatory spatial mapping is a valuable and effective approach for fostering inclusive, community-based tourism development for Tuwed Village.

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