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Sustainable Ecotourism Village Management Model in Pancoh, Indonesia

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Abstract

Ecotourism villages are an important sector in mobilizing local communities to improve community welfare and contribute to responsible environmental sustainability. This research aims to analyze the ecotourism village management model and determine the success factors of the ecotourism village model. This study provides direction for ecotourism village management that not only looks at internal institutions, namely the organizational structure and management framework, including analyzing stakeholder involvement, the ability to manage pressure, and change, as well as success factors that contribute to the literature on sustainable ecotourism villages. The research method uses a qualitative approach with a case study design in Pancoh, Indonesia. Data was collected through in-depth interviews with stakeholders, namely tourism village managers, community leaders, district and sub-district governments, homestay owners, and MSME business actors. Data is also taken through observations during tourist visits to see interactions in attraction activities in ecotourism, and documentation based on study topics relevant to sustainability and ecotourism management, as well as official documents owned by the government and ecotourism village managers. Data analysis techniques are carried out by condensing data, presenting data, and drawing conclusions. The findings in this research show that the ecotourism village management model has been successful in implementing various factors that have implications for the sustainability of tourist villages. This research emphasizes the importance of the ecotourism village management model as a form of sustainable development. The research results can be a basis for developing participatory, collaborative, and sustainable tourism village management policies. This study contributes to the solution SDG 11 sustainable cities and communities; SDG 15 Life on land.

1. Introduction

Ecotourism villages are alternative tourism amidst the saturation of mass tourism. Ecotourism provides an experience for visitors to enjoy natural tourism that contains educational values and builds environmental awareness. The natural beauty and pristine natural environment have attracted urban residents away from noise and pollution. Rural tourism with government support can effectively stimulate economic development in the region (Shang et al., 2020). The success of tourism villages can direct and facilitate the flow of capital, talent, information, technology, and management factors in rural areas, accelerate the integrated development of various industries in rural areas, and optimize urban and rural systems and spatial arrangements (Xiang et al., 2020). However, there are several problems in managing tourist villages in various regions. The existence of tourism activities is detrimental to the environment due to irresponsible rural tourism (Ramaano, 2025). The challenges of the rural tourism sector are limited infrastructure, seasonal demand fluctuations (Nametova et al., 2025), and the ineffective role of stakeholders (Fadlurrahman et al., 2025). The next obstacle is limited insight into market segments and destination demand management (Fu et al., 2025).

Research topics on ecotourism village management have been carried out by previous researchers. Findings (Howitt & Mason, 2018) that ecotourism has become a major component of the local economy,

but incomes are not sufficient for most households, so engagement in agriculture and other wage employment also remains an important component of household income strategies. (Jaya et al., 2024) stated that ecotourism significantly increases perceptions of openness, local community ties, and resource conservation, but the obstacles to the sustainability of tourist villages include corruption, local community distrust of the government, and lack of ecotourism planning initiatives. Research (Utama et al., 2022) aims to determine community involvement in ecotourism management, finding that ecotourism can integrate nature and tourism so that it becomes an attraction to improve the community's economy as a whole. (Abdurakhmanova & Ahrorov, 2025) shows that ecotourism significantly increases local income and employment opportunities. However, challenges such as inadequate infrastructure, a lack of trained workforce, and weak regulations hinder the full realization of ecotourism potential. Research (Adhikari et al., 2024) aims to map waste management in tourist villages and produces findings that recycling waste management needs to be improved with a holistic waste management strategy.

Previous research has not discussed the sustainable ecotourism village management model, so the researchers did it with the aim of analyzing the implementation of the ecotourism village management model. This model not only emphasizes aspects of the structure and management framework, stakeholder involvement, and the ability to manage pressure and change, as well as success factors. In line with that, this research aims to explain two important things. First, the existing model for managing ecotourism villages refers to the Global Sustainable Tourism Council (GSTC) indicators. This section explains the concept and analysis of the implementation of ecotourism management. Second, the model distinction explains the success factors that differentiate this model from existing tourism management models. These two important things holistically provide an explanation of the sustainable ecotourism village management model.

2. Literature Review

2.1. Sustainability tourism

The World Tourism Organization (UNWTO) defines sustainable tourism as tourism that comprehensively considers economic, social, and environmental impacts, both now and in the future (Purnomo et al., 2020). Tourism management must be carried out without causing environmental damage, accompanied by respect for social, ecological, and cultural values. Apart from that, this activity is expected to be able to contribute to improving the economy while the activity is taking place (Bušljeta Tonković, 2019). Sustainability currently includes the development of infrastructure supporting environmental and cultural ecosystems. This not only protects biodiversity conservation and habitat quality but also prevents excessive pressure on the area to optimize sustainable tourism management while preserving natural ecosystems (Ghasemi et al., 2024).

2.2. Management of the ecotourism village

In recent years, the global tourism industry has undergone a considerable transformation, influenced by increasing numbers of tourists, technological advances and increasing environmental awareness (Chon & Hao, 2025; Filipiak et al., 2023; Pencarelli, 2020). Rural tourism management is an integrated strategy for sustainable regional development by creating new jobs or stimulating tourism development (Mazur & Kurowska, 2025). The Covid 19 pandemic has become a catalyst for change that has led to the need for innovation in dealing with extreme situations by paying attention to the relationship between business sustainability and environmental sustainability (Anzules-Falcones et al., 2024).

Ecotourism is a rapidly growing subsector of sustainable tourism, increasingly recognized as a tool for economic development and conservation. Ecotourism has become a key component of sustainable development strategies in many countries, offering exciting natural experiences and fostering appreciation for ecosystems (Rana, 2023). On the other hand, ecotourism can contribute to local economic development and provide a non-consumptive source of income for conservation (Mudasir, 2020). Comprehensive policies, community involvement, and collaboration between stakeholders are needed to maximize the benefits of ecotourism and ensure its long-term viability as a driver of sustainable development (Mazmishvili, 2024). In Ukraine, the impact of similar policies can be seen through data from mobile operators, big data technology, and electronic visit permits by tracking tourist arrivals and measuring their impact on the ecosystem (Kalaitan et al., 2021).

In addition, active community participation not only strengthens ownership of natural resources but also reduces the possibility of conflict between environmental protection and local economic needs (Kia, 2021; Ondara et al., 2020; Sobhani et al., 2022). The Community-based ecotourism (CBET) model has proven successful in several Southeast Asian countries, including Indonesia and Vietnam. This approach contributes to biodiversity conservation, while simultaneously creating employment opportunities and preserving local cultural values (Blanton et al., 2024; T. D. Nguyen et al., 2022; T. V. D. Nguyen et al., 2025). Furthermore, using digital technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and geospatial data, smart ecotourism can achieve real-time environmental impacts and enhanced experiences with individuals. The integration of this technology also supports transparency and accountability in tourism management, and ultimately strengthens conservation and sustainability efforts (Aliyah et al., 2023; Rane et al., 2023; Zhang & Deng, 2024).

Sustainable ecotourism village management in this research refers to the Global Sustainable Tourism Council (GSTC, 2019) Concept including: management structure and framework, stakeholder involvement, and the ability to manage pressure and change. The destination management structure and framework emphasize the existence of a management institution that has clear authority, adequate organizational capacity, and funding sources capable of coordinating sustainable tourism. This institution is responsible for planning, implementing, monitoring, and reporting destination management by involving the public, private, and community sectors. Management is carried out based on strategies and medium-term action plans, which are prepared in a participatory manner, based on sustainability principles, and taking into account socio-economic, cultural, and environmental aspects (Purwanto,

2009). A monitoring and evaluation system is carried out periodically to assess the impact of tourism, and the results are reported transparently to the public.

Stakeholder involvement is a key element in sustainable destination management through pentahelix collaboration, including the business world, local communities, visitors, academics, and mass media. Destinations actively encourage tourism village managers to implement practices and meet sustainability standards, including relevant certification. Local communities are involved in the planning and management process, taking into account their aspirations and level of satisfaction, monitored and followed on openly. In addition, visitors are involved through the provision of information regarding the sustainability of the destination and feedback mechanisms regarding the quality of the tourism experience. All promotional activities and information are delivered accurately, responsibly, and respect local social, cultural, and environmental values. Promotion of tourist villages requires appropriate communication media to influence the perception of visitors coming to ecotourism villages. Electronic-based mass media have now become a part of modern society's life. The ability of mass media to disseminate information quickly becomes a promotional tool for marketing tourism products without being limited by the dimensions of space and time. The involvement of academics, namely universities and research institutions, plays a role in forming a knowledge-based society. The form of academic involvement is increasing human resource capacity through education and training, developing potential, and building entrepreneurship. Innovation is the keyword for building synergy between stakeholders in realizing prosperity while maintaining cultural and environmental sustainability.

A destination's ability to manage pressure and change is reflected in the implementation of a visitor management system, development control, and preparedness for environmental risks and dynamics. Destinations monitor and regulate visitor numbers and activities to maintain a balance between economic benefits and social, cultural, and environmental sustainability. Development planning and control policies are implemented consistently through regulations based on impact analysis and public participation. In addition, destinations integrate climate change adaptation strategies into tourism management and have risk, crisis, and emergency response management plans that are communicated to all stakeholders and updated regularly.

2.3. Success factors for ecotourism village management

Supporting factors for the sustainability of green economy ecotourism village management refer to the opinion (Djuwendah et al., 2019). This includes commitment and openness of the community, leadership figures, and creativity in packaging tourist attractions. Commitment is formed through the collective concern of individuals and local community members, creating a sense of togetherness that gradually develops into a social commitment to caring for the community and the environment (Siriwong et al., 2025). The openness of the community to outsiders or tourists, as well as the ability to develop themselves with their potential, can create community-based tourism villages as an effort to improve the economy and quality of life of the community (Herdiana, 2019). Leadership figures are attributes that a person has to drive and increase the growth of rural tourism businesses and make a significant contribution to strengthening the local economy (Schmidt et al., 2025).

3. Material and Method

3.1. Unit analysis

This study describes the ecotourism village management model and the success factors for its implementation as the unit of analysis. The main focus is on analyzing the organizational structure and management framework, stakeholder engagement, and how ecotourism villages face pressure and change. Furthermore, this study identifies success factors in ecotourism village management. Therefore, this study provides an in-depth analysis of ecotourism village management to describe management indicators based on the GSTC and identify success factors for ecotourism village management. The creativity of tourist attractions is a place that not only provides everything that tourists can see, but also offers activities that can be done at that place and becomes an attraction that attracts people to visit that place (Helpiastuti, 2018). Destinations that have distinctive characteristics or uniqueness can provide charm or attraction for visitors during their visit and can even captivate them longer by returning to the destination.

3.2. Research design

This research used a qualitative, case study-based design to address the issue of sustainable ecotourism village models. The researchers employed a qualitative design to gain a deeper understanding of ecotourism village management through the perspectives of informants, in line with a descriptive approach that emphasizes exploring narratives and social phenomena.

3.3. Data collection

Data collection techniques include observation, semi-structured interviews, and document analysis to understand the ecotourism village management model, success factors, and implications of implementing a sustainable ecotourism village model that produces descriptive narratives according to the context of the discussion. The informants can be found in Table 1. The data on questions submitted to informants are in Table 2.

Table 1
The informants

No	The informants
1	Tourism village advisor
2	Deputy head of the tourist village
3	Secretary of the tourist village
4	Tour Guide
5	Homestay owner
6	Instructor
7	Local community leader
8	MSMEs actor
9	Farmer
10	Girikerto Village secretary
11	Head of BUMDes
12	Conservation Coordinator of the Sleman Regency Government Environmental Office
13	Head of Human Resources Development Division, Sleman Regency Tourism Office
14	Head of the ATLAS Division of the Sleman Regency Cultural
Noted: The determination of informants is based on their understanding of the research object and the data they have.	

Table 2
Data requested

No	Indicators	Data requested
1	Sustainable tourism village management	
1.1	Management structure and framework	1. How is the institutional structure, division of tasks and authority, and institutional mechanisms?
		2. How do you provide funds for the operation of tourist villages?
		3. How are strategic plans and program plans prepared?
		4. How is the monitoring and management of the Pancoh ecotourism village?
1.2	Stakeholders engagement	1. Who are the stakeholders in Pancoh Ecotourism Village? How are stakeholders involved?
		2. What is the visitor feedback about the Pancoh ecotourism village?
		3. How are stakeholders involved in promotion and information delivery?
1.3	Managing pressure and change	1. How do you manage the number of visitors and their involvement in activities?
		2. What are the rules and controls for development planning in Pancoh?
		3. How does the program adapt to climate change?
2	Success Factors	1. How committed is the community to developing the potential and managing ecotourism villages?
		2. How is the community's attitude of acceptance towards the existence of ecotourism villages and the presence of outside parties?
		3. What is the role of leadership figures in Pancoh Ecotourism Village?
		4. How creative are the tourist attractions?
Noted: Coding is done based on data searches according to previously determined indicators.		

Semi-structured interviews were used to explore informants' perceptions of the success of Pancoh ecotourism in managing sustainable tourism villages. In-depth interviews were conducted to explore the views of the Environmental Agency, Tourism Agency, BumKal, ecotourism advisors, the Deputy Chairperson of Ecotourism Management, MSMEs Actors, Homestay Owners, and tour guides on significant ecotourism village management. Observations were conducted to record the daily activities carried out by informants, such as the implementation of guides' duties in accompanying visitors and

homestay owners providing services to visitors staying in their establishments. Researchers witnessed internal meetings held by ecotourism managers. Academic literature such as The combination of these information sources produces a comprehensive descriptive narrative, providing relevant insights to understand economic, environmental, and social sustainability in ecotourism village management. Observations were conducted through direct recording of the tourism village management process, such as how ecotourism impacts sustainability, as well as the distinctive factors of its success.

3.4. Data analysis

Data were analyzed using an inductive approach with three main stages referring to *(*Miles et al., 2014) including data condensation, data presentation, and conclusion drawing. This approach allows researchers to identify patterns, themes, and meanings in the data, enabling a deep understanding of the sustainable ecotourism village model and the success factors of ecotourism villages. Data reduction was carried out to classify data into several categories based on findings from observations and interviews, such as ecotourism village management and success factors, thus facilitating understanding of the presented data. Data presentation is used to describe the findings based on the classification of data categories. The conclusion is in the form of a description or overview of the ecotourism village model and answers questions from the problem formulation and objectives of this study.

4. Result

4.1. Implementation of sustainable ecotourism village management

4.1.1. Location description

Pancoh ecotourism village is located in Girikerto, Turi District, Sleman Regency, Indonesia. This ecotourism is one of the Government's pilot projects in realizing sustainable tourism villages. Since its establishment in 2014, Pancoh has focused on empowering residents and developing the village's potential into educational tourist attractions. Its natural potential consists of the beauty of rural nature with the backdrop of Mount Merapi, reservoirs, salak fruit orchards, fish ponds, and rice fields. This potential is packaged in educational tourism offered, including: making handicrafts (Caping Art, Batik, Handmade from plastic waste), gamelan art, dances, and karawitan, planting, caring for, and picking salak fruit, making biogas, plowing rice fields, fishing, and river tracing (Jadesta, 2023). These various attractions make Pancoh known as a responsible and sustainable nature-based tourist destination in Sleman.

The implementation of sustainable tourism village management is based on three main pillars: management structure and framework, stakeholder engagement, and the ability to manage pressure and change. Each research finding is described in the subchapters below.

4.1.1. Management structure and framework

The management of the Pancoh Ecotourism Village, as conveyed by the Tour Guide, states that the Pancoh organizational structure has been established and has been running for 3 periods. The number of administrators is around 30 people, involving 70 residents' homes that are used as homestays and business actors who are members of MSMEs. Types of businesses in Pancoh include batik crafts and handicrafts from plastic waste, culinary and processed salak fruit products, and processed goat milk products. There is a division of roles among the managers of the tourism village. According to community leaders, advisors serve as liaisons between the community and district and provincial governments. According to the Secretary of Ecotourism, internal management responsibilities are carried out by the administrators, while environmental responsibilities are carried out by the local government. The institutional mechanism is implemented with organizational guidelines in the form of standard operating procedures (SOPs). According to the instructor, there are SOPs for guides that include educational materials on salak fruit cultivation procedures and mastery of the art of karawitan. The management also provides opportunities for residents who do not have expertise to be assisted in field activities during outbound or river exploration.

Furthermore, regarding funding, according to the Tourism Village Advisor, visitors are charged a fee for outbound packages (Fig 2a) starting from 60 thousand rupiah, a 2-day, 1-night live-in package (Fig 2b) of 270 thousand rupiah, and a 3-day, 2-night live-in package (Fig 2c) of 360 thousand rupiah. According to the homestay owner, the cost of staying for school students per day is 35 thousand rupiah. Furthermore, the Head of the Village-Owned Enterprise (BUMDes) stated that funding in Pancoh is sufficient, both from the village and district governments, grants, and assistance from institutional networks. Revenue from visitors is used for operational costs and guide honoraria.

The strategic plan and ecotourism management program were prepared by the Head of the Human Resources Division of the Sleman Tourism Office, the Deputy Head of the Tourism Village, and the Secretary of Girikerto Village, to implement sustainable tourism development policies. The master plan and tourism management received support from universities and the government. Likewise, marketing was assisted by the Girikerto Village-Owned Enterprise (BUMDes). The Pancoh Ecotourism Village work program includes training in homestay services, tourism management, improving foreign language skills, land conservation programs, and passing on cultural heritage traditions to the younger generation.

According to advisors and community leaders, monitoring and evaluation of the management of Pancoh Ecotourism Village is carried out through the Village-Owned Enterprises Forum every 2 months, and ad hoc meetings are held if there are tourist visit agendas that need to be discussed, allowing the community to ask questions directly about tasks that must be carried out. Meeting minutes are still done manually, and data is stored electronically. Furthermore, the community is also involved in monitoring and evaluation through village meetings held periodically every 3 months to monitor the progress of tourism village management.

4.1.2. Stakeholder engagement

Various parties are involved in the planning and management of Pancoh, including BUMDes, Academics, Regency Government, Village Government, NGOs, and the community, as stated by the Head of BUMDes that the involvement of BUMDes began in 2017 through the provision of business capital for the construction of buildings or infrastructure, and then developed further in the development of tourist villages. The involvement of academics was conveyed by the Deputy Head of the Tourism Village that the Faculty of Cultural Sciences of UGM assisted in the packaging of cultural attractions, Atmajaya, on the master plan (Vitasurya et al., 2024), UKDW on architecture, UII on foreign language guide training, then tourism studies from UGM, API Tourism College, Samarinda Polytechnic, and UIN Salatiga. Then UNISA Yogyakarta and UTY conducted KKN. The Conservation Coordinator of the Sleman Regency Environmental Service added that there was a mentoring activity for the Monitoring Center Sustainable Tourism Observatories (MCSTO) from UGM to implement sustainable tourism development.

The government is also involved in managing tourist villages, as stated by the Human Resources Development Coordinator of the Sleman Regency Tourism Office. This involves coaching and mentoring sustainable tourism villages and providing facilities such as the Pancoh Ecotourism Village icon and a secretariat office. The Environmental Agency also provides supporting infrastructure, such as trash bins and planting seeds. Furthermore, the Regional Government also pays attention to improving human resources. Several training activities involving Pancoh ecotourism managers include excellent service training and training on developing the capacity of tourism human resources in the implementation of sustainable tourism. The results of the training and mentoring have resulted in Pancoh ecotourism obtaining competency certification as tour guides. Furthermore, the Regional Government provides training on waste management and household wastewater purification. The results of these activities are eco-enzyme products that can be used for various purposes and clear water that is used for fish ponds.

Furthermore, the involvement of Non-Governmental Organizations according to the Deputy Chairperson of the Tourism Village and Guides, conveyed that the NGO LPTP has since the beginning of ecotourism provided assistance in mapping potential and managing agriculture offered to ecotourism visitors. Then the involvement of the community as the main stakeholder was conveyed in the results of interviews with the Deputy Chairperson and advisor of the tourism village that the community involvement reached 80% with the division of tasks according to their skills, community members who work as farmers were made instructors for farming activities and picking salak fruit, as well as education on processing livestock waste into biogas. Children from Karang Taruna were empowered to become guides, and the community was involved in providing homestays for tourists who took the live-in package. As well as business actors, were involved as instructors for processing salak fruit into various kinds of food.

The Deputy Head of the Tourism Village and community leaders conveyed the involvement and feedback from local residents, indicating public participation in the planning and management of sustainable destinations. The community consists of several groups: agricultural, livestock, and arts groups. All groups are actively involved in the tour packages. Farmers are involved as guides for salak fruit

cultivation activities and invite live-in participants who stay at their homes to participate in farmer activities in the fields. Arts groups teach children how to play gamelan and dance.

Visitor engagement and feedback are indicators of a system for monitoring and reporting satisfaction, such as interviews or exit surveys, or complaint handling. Based on visitor impressions written in the guest book, it can be seen that visitors expressed positive impressions during their visit and stay at Pancoh. According to the Tourism Village Advisor, the management also maintains good relationships with visitors through WhatsApp communication. This gives visitors a positive impression of the friendliness of the Pancoh community. Visitors also appreciate the calm and peaceful community life.

Furthermore, the involvement of stakeholders in promoting and disseminating information with indicators, such as tourism destinations, products, and services, is carried out accurately, authentically, responsibly, and respectfully towards local communities and tourists. The Head of Bumdes and the Secretary of Girikerto Village conveyed that tourist destinations in the Village including Pancoh ecotourism, are promoted in one package consisting of all the potentials in Girikerto, namely environmental education tourism, arts, goat cultivation and goat milk products, as well as agricultural cultivation and fruit plantations. Promotional media to offer Pancoh ecotourism is carried out through Facebook, Instagram, and collaboration with travel agencies. There was also a visit from journalists from the Sleman Regency Tourism Office Team.

4.1.3. Managing pressure and change

Managing the pressures and changes referred to includes managing the number and activities of visitors, the existence of guidelines or development control plans, adaptation to climate change, risk and crisis management. The management of the number and activities of visitors can be seen through the presence of a visitor management system that is reviewed regularly. This action is taken to monitor and manage the number and activities of visitors, and to reduce or increase visitors as needed at a certain time and place, the destination strives to balance the needs of the economy, society, cultural heritage and the local environment. The management of the number and activities of visitors was conveyed by the Secretary of the Tourism Village and the Tourism Village Advisor that Pancoh ecotourism applies restrictions on the number of visitors as part of the implementation of carrying capacity as an effort to maintain environmental sustainability and limited human resources in providing services so that the number of visitors is limited to a maximum of 500 people or 2 groups of guests even though it does not reach 500 people in one day.

Planning regulations and development control can be seen from the existence of guidelines, regulations, and policies regarding ecotourism development planning that include environmental, economic, social, zoning, land use, design, and development impact assessments, which are prepared together with local communities in order to protect natural and cultural resources. These guidelines, regulations, and policies are communicated openly, and their enforcement is applied. The policy on ecotourism development planning and development, according to the Deputy Chairperson of the Ecotourism Village and the Head of Human Resource Development of the Tourism Village, is carried out by the ecotourism

manager with assistance from Atmajaya University in preparing the master plan. Meanwhile, the implementation of policies in controlling environmental impacts is conveyed by the Advisors and guides of the tourism village, including not littering, not defecating in the river, and not damaging the nature around the tourist location. The form of rules is in the form of information conveyed verbally to visitors. If there are people who cut down trees, they will be required to replant them.

Climate Change Adaptation can be seen in the existence of climate change adaptation systems, regulations, policies, and programs, risk reduction, and awareness raising for the community, and tourism businesses. According to the Conservation Coordinator of the Sleman Environmental Agency and Deputy Chairperson of the Tourism Village, climate change adaptation emphasizes environmental aspects as a priority in addressing the changes that occur. Its implementation includes reducing electricity consumption through the use of LED lights, increasing plants, having water reserves in reservoirs, socializing energy savings, waste management, utilizing biogas as a new renewable energy source, increasing vegetation to protect the natural environment through land conservation, conducting environmentally-based tourism branding through social media, and establishing rules that must be obeyed by visitors. In the technological aspect, tourism village managers strive to digitally promote the tour packages and facilities offered. In implementing risk reduction and awareness-raising activities, the community and visitors are involved in following the established rules.

4.2. Success factors

The success factors for implementing a sustainable tourism village management model are identified, and field findings that provide an overview of the key elements that differentiate this model from conventional approaches, as well as demonstrating the strategic conditions that support its success in the field. Several aspects that are the focus of differentiation of this model from other models are commitment, community openness, leadership figures, and creativity of tourist attractions, so that the developed model can serve as a reference in the planning and implementation of sustainable tourism policies. The following are some factors or distinctions of the successful model, which are described as follows:

1. Commitment is the creation of conditions of interdependence and mutual understanding among various stakeholders. Commitment begins to build based on collaboration with various parties and produces positive impacts felt by the tourist village and its community. Based on the results of interviews with the tourist village advisor, it was stated that the community's commitment to developing the potential of the tourist village into a tourist destination is supported by a shared awareness to manage natural potential as an alternative business that generates income and remains committed to environmental preservation, namely ecotourism. According to the Environmental Conservation Coordinator of the Sleman Regency Environmental Service, the ecotourism commitment is also supported by collaboration with universities in mentoring sustainable tourist villages.

2. The intended openness of the community refers to the community's acceptance of visits by tourists and outsiders, which changes their perception and willingness to utilize village potential as an alternative business venture outside the agricultural sector. The community is open to visits. The presence of the LPTP NGO in mentoring and empowerment is accepted as part of learning to manage the natural environment potential that is being developed into a tourist village. The community accepts government assistance in waste management and waste processing. Thus, an open community attitude supports the sustainable management of tourist villages.
3. A leadership figure in a tourism village is an individual or group who plays a central role in leading, directing, and managing the development and sustainability of a village designated as a tourism destination. Leadership in a tourism village is not only related to the management of natural resources and existing tourism potential, but also to empowering local communities, maintaining cultural authenticity, and ensuring that economic benefits are felt by the local population. This leadership figure can act as a catalyst in supporting the success of the tourism village through a clear vision, the ability to manage conflict, and the ability to build synergy between the various parties involved. The success of management in the Pancoh ecotourism village is determined by the presence of a leader who dares to put forward ideas for change and plays a role in communicating to external parties (the government) and the community what was originally an agricultural village into an ecotourism village and developing the potential in Pancoh into an attraction for tourists with educational value and sustainability.
4. Sustainable tourism emphasizes the need for managers to think critically and analyze strategies to discover new things as an effort to change and adapt to these changes through the development and improvement of services for the benefit of the community and tourists. The management continues to develop creative tourist attractions. Pancoh Ecotourism annually develops its attractions and service facilities with various innovations, including adding culinary facilities, creating tour packages, adding safari trips to tourist locations around Turi and Kaliurang, and improving existing facilities.

5. Discussion

This research presents findings on implementing an ecotourism village management model and the success factors for realizing a sustainable ecotourism village. This model can be applied at the community-based village level. The ecotourism village management model in Pancoh operates within an interesting geographical and social context because it is the only tourist village in Sleman Regency, Indonesia, committed to nature conservation. Geographically, Pancoh is located on the slopes of Mount Merapi, which serves as a buffer zone for water catchment. Rural tourism based on the potential of agricultural and livestock land offers an alternative to increase the selling value of agricultural products and to develop new renewable energy sources that support sustainable tourism. The offered tour packages combine living with education in agriculture, nature conservation, and processing livestock waste into biogas. Visitors are also involved in cultural activities such as the kenduri tradition, dances, and playing gamelan as an effort to internalize cultural heritage values.

The institutional structure and management of the tourism village include management responsibilities, management strategies, and action plans, as well as monitoring and reporting on destination management. Tourism destination management involves the responsibilities of various parties, including the government, the private sector, local communities, and tourists, to ensure the sustainability, comfort, and continuity of the destination. It can be seen that the management of the Pancoh Ecotourism Village is well implemented. Some conditions that can be found in the organizational management of the Pancoh ecotourism village include the existence of an institutional structure, SOPs, and a sustainable management framework that involves the community, including the Karang Taruna (Youth Organization). The results obtained in the field complement the results of research (Lestari et al., 2025) The existence of an organization encourages community involvement in fulfilling its respective functions and duties and developing strategic plans so that management becomes more structured and well-organized. Local communities play a substantial role in the development and management process, as well as the utilization of resources that can be absorbed by the community, thereby creating technology and innovation for the sustainability of the tourism village. Management runs with sufficient funding support from various parties. This finding is in line with the opinion that funding support from the government, social organizations, and universities can help develop tourist villages (Li & Huang, 2020).

Destination management strategies and action plans are realized through the organization's vision and mission, which include action plans to achieve objectives while still considering competitive conditions and external impacts. This finding is in line with (Hindayani et al., 2025) that a comprehensive strategy for sustainable tourism development is crucial in various aspects, from planning, land capability and feasibility to determining carrying capacity and mitigation as well as developing tourism activities and objects. Since its inception in 2014, Pancoh Ecotourism Village has developed various tourism attractions. There are 5 activity attraction packages that tourists can choose from, ranging from outbound, camping, and live-in. Each tour package includes several activity options such as river cruises across the Monthet Bridge, nature exploration around and between tourist locations, educational tours in the form of biogas processing, tree planting, releasing pandemic birds, distributing fish in reservoirs, batik, practical food processing, making crafts from plastic waste, painting caping, and making wayang from coconut leaves. Tourists are also directly involved in cultural arts attractions such as the traditional wiwitan ceremony, saparan, jenangi, kenduri on the last night of live-in and other cultural activities such as karawitan and dances. Natural adventure tourism attractions such as outbound, camping and outings for families, communities, schools, campuses, and various companies.

Tourism village managers also conduct monitoring and evaluation as part of their management. The purpose of monitoring and evaluation is to determine the suitability of the work program plan based on the needs and characteristics of a tourism village. Furthermore, this activity also aims to determine the process of implementing tourism village management and development in accordance with the established plan. Through monitoring and evaluation, tourism villages can also determine the success of achieving predetermined targets. Monitoring and evaluation in the Pancoh ecotourism village is carried out by inviting community participation, such as youth organizations (Karang Taruna), residents living in

the village with various professions such as farmers, livestock breeders, tour guides, and outbound instructors.

Monitoring and evaluation results show that the community strongly supports the establishment of an ecotourism village. The community exhibits a friendly attitude and a strong culture of mutual cooperation. The village community is actively involved in the management of the Pancoh ecotourism area. During the 12 years of Pancoh ecotourism management, there has been an increase in community involvement in tourism management and activities, such as acting as tour guides, homestay providers, instructors, culinary services, and souvenir providers. The community is also independently involved in the development of MSMEs with superior products such as wingko salak, eggrolls, pia salak, and various processed salak fruit products such as salak fruit chips, salak fruit crackers, and salak fruit jenang. Batik and other waste-based creations support the sustainability of the community-based tourism village. Active community involvement in environmental maintenance is carried out through scheduled community service. With the existence of a tourism village, the community becomes the subject of village tourism development and increasingly plays a role in protecting and preserving the environment and culture. The results of this study are in line with the findings (Wu et al., 2025) that ecologically aware tourism and balanced socio-economic development support more sustainable and community-oriented tourism planning.

In terms of tourism village promotion and marketing, the strategy involves maintaining good relationships with schools, universities, and institutions that have visited Pancoh. Tourism village promotion is a marketing effort undertaken to introduce the potential, attractions, and uniqueness of a tourism village to the wider community. The main goal is to attract tourists to visit the village, increase the number of visits, and support local economic development. This promotion involves various strategies, such as cultural attractions that showcase cultural excellence, traditional values, food/culinary products, and the natural landscape of the tourism village. Marketing strategies also involve tourists in nature conservation activities, thereby fostering interest and awareness among tourists to return to see the development of previously planted trees, fish released in the reservoir, or artistic attractions, and enjoy the natural attractions. Promotional media used include Facebook, Instagram, the village website, the government website, and articles by several journalists on various media platforms. The results of this study align with the findings (Oka & Subadra, 2024) that digital marketing plays a strategic role in promoting tourism villages. Some media identified as having an influence on the sustainability of visits include websites, social media, search engines, email marketing, and online advertising, as most tourists discover tourist villages through online media.

Stakeholder involvement in tourism village management is crucial for achieving sustainability and the well-being of local communities. Several parties involved in tourism village management include the government, local communities, local organizations and institutions, the tourism industry, and academics and researchers (Wisnumurti et al., 2020). The government's role in Pancoh ecotourism has been significant since its designation as a tourism village. Pancoh has also participated in sustainable tourism mentoring activities initiated by the Ministry of Tourism and the Sleman Regency Tourism Office.

The local government also empowers the community through training and human resource development in areas such as guide training, tourism village management, and homestay management. The government also provides infrastructure assistance in the form of a tourism village icon, an ecotourism village secretariat office, waste disposal facilities, and tourist location information boards. Furthermore, the village government, through its regionally owned enterprise (BUMKAL), provides capital and promotional assistance for ecotourism development.

Collaboration between various stakeholders is crucial for achieving sustainable tourism village management and maximizing benefits for local communities (Junaid et al., 2022). Pancoh Ecotourism has engaged stakeholders in collaboration with the government, Village-Owned Enterprises (BUMDes)/Village-Owned Enterprises (BUMN), universities, and the community on an ongoing basis. The results of this study complement the results of the study (Stone, 2015), (Nurkhalis et al., 2018) on the need to hold joint meetings to formulate an effective ecotourism development model that can be applied to traditional areas while taking into account the preserved culture. This research also complements the study (Mudana, 2016) that found that village community empowerment, including human resource development, economic development, institutional development, infrastructure/facility development, and information development, supported by the government, NGOs, the private sector, and universities, can support the sustainability of tourism villages. The results of this study are in line with the conclusion that the initial stage of tourism management change based on the change model proposed by John Kotter is the phase of creating a climate of change that includes establishing a sense of urgency, by determining the importance of tourism change management, which encourages all stakeholders to support everything necessary for management transformation and continues to convince stakeholders that changes in tourism management are needed (Kismartini et al., 2021) and research findings that state that a multidisciplinary approach, referring to the fields of sustainable tourism, destination management, and system dynamics, is applied to identify the requirements for decision support systems in tourist destinations (Alexandra et al., 2012) as well as research findings (Kusumawardhana, 2023) that sustainable tourism is implemented in harmony with community empowerment. The government can increase its role in improving the quality of human resources and increasing the quality and quantity of accommodation facilities at tourist attractions. This study complements the opinion (Fadlurrahman et al., 2025) on the importance of an inclusive governance model that encourages collaboration between the public and private sectors, as well as community participation in the planning and implementation process and strengthens tourism sustainability.

Managing pressures and changes includes managing visitor numbers and activities, establishing guidelines or development control plans, adapting to climate change, and managing risks and crises. Managing visitor numbers and activities is a crucial part of tourism and conservation area management. Visitor management ensures that a site's capacity is not exceeded, prevents damage to facilities, and provides a better visitor experience. Pancoh Ecotourism implements visitor restrictions in its capacity management. These restrictions are enforced with a maximum of two groups per day or a maximum of 500 visitors. The purpose of these restrictions is to preserve the natural environment due to human activity and behavior at the tourist site, and the limited number of human resources available to provide

services. Guides guide visitors to adhere to environmental regulations. Guides monitor visitor activity by dividing groups into groups of 10 people. Each destination and homestay is provided with facilities such as trash bins, walking paths, and toilets.

Development control practices in the Pancoh ecotourism area are implemented through the development of an ecotourism master plan to preserve the natural environment. This master plan was developed with assistance from universities and the government. Meanwhile, policies to control environmental impacts include outreach to the community and visitors, urging them to refrain from littering, defecating in rivers, and damaging the natural environment around the tourist site. These findings align with (Nugraha et al., 2021) opinion on the need for coordination and control of tourism development with all tourism stakeholders, especially the government, to create short, medium-, and long-term tourism development plans, prioritizing sustainable tourism development. This research complements (Juniar & Gani, 2025) The opinion is that management practices that consider environmental carrying capacity and provide direct benefits to local communities are crucial to ensuring long-term tourism sustainability.

Climate change poses significant challenges for tourism villages, particularly due to their reliance on environmental conditions and natural resources to attract tourists (Dube & Nhamo, 2020). However, appropriate adaptation can help tourism villages survive and even thrive in the face of climate change impacts. The definition of climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle (Purwanto, 2025a). Pancoh Ecotourism has successfully adapted to the changes and pressures faced through various measures, including promoting energy efficiency, waste management (Milasari et al., 2025), utilizing biogas as a renewable energy source (Purwanto, 2020, 2025b), increasing vegetation to protect the natural environment, branding and promoting ecotourism icons through social media, establishing mandatory rules for visitors, and mitigating potential disasters. The results of this study complement the conclusions of research (Hasyim et al., 2020), which states that in today's global competition, the quality of service at a destination significantly influences tourist behavior, their perceptions, and their decision to revisit. The country or region can leverage its history, natural potential, cultural heritage, or local wisdom as tourist attractions and potential as a new destination. This is certainly a strategy for sustainable tourism development.

The success factors for the sustainability of the Pancoh ecotourism village align with research findings (Ferdian et al., 2024) which shows that the commitment, attitudes, and performance of stakeholders significantly influence the sustainability of tourism villages. Furthermore (Cardak, 2025) states that the openness of the local community prioritizes the potential economic benefits of tourism and emphasizes the importance of protecting local traditions, handicrafts, and culinary heritage. The community's openness to outsiders who will visit and acceptance of the conditions as a tourist village play a vital role in the sustainability of the tourism village. Community participation is a manifestation of the openness and active involvement of individuals, groups, or communities (Tosun, 2000) in the decision-making process, implementation, monitoring, and evaluation of various programs or activities related to the

public interest (Kaehe et al., 2019). This participation includes various forms, such as providing opinions, participating in social activities, or collaborating with others in building shared prosperity.

The governance approach is built on three interrelated pillars: community-based participation, environmental sustainability, and tourism practices aligned with cultural values. Furthermore, research (Purnomo & Purwandari, 2025) shows that leadership and innovation are important drivers of MSME empowerment, with technology in service quality significantly influencing tourism development. Findings (Aunchistha, 2025) indicate that a community-led process involving strong leadership, democratic decision-making, and a combination of spiritual beliefs with an environmentally-oriented economic model implemented by the community can encourage economic resilience, social empowerment, and sustainable development in the post-pandemic era. Pancoh Ecotourism experiences various creative changes every year, including adding culinary facilities, creating attractive tour packages, and improving the condition of buildings or attraction locations. This study complements research (Buchori et al., 2023) that suggests that creativity and product innovation need to be carried out sustainably. Management can provide attractions or services that can meet tourist needs. The sustainable ecotourism village management model can be described in Fig. 3.

6. Conclusion

This study examines the management of ecotourism villages through the lens of green economy principles. It outlines how these principles are applied in the governance of tourism villages to support sustainable tourism development. The findings indicate that several key success factors, including institutional commitment, community openness and participation, the presence of influential local leadership, and the development of innovative tourism attractions, strongly influence the effectiveness of this management model. Together, these elements contribute to the creation of a sustainable and adaptive ecotourism village framework.

The study makes a significant contribution to the literature on sustainable development by integrating green economy concepts, community participation, environmental sustainability, and stakeholder collaboration within a single analytical framework. While previous studies have generally examined these dimensions in isolation, this research adopts a holistic approach that captures their interconnections in ecotourism village management. The results enhance existing knowledge on environmentally oriented tourism governance models and emphasize the role of inclusive community empowerment in supporting sustainable tourism. In addition, the findings provide valuable practical insights for policymakers, particularly in designing policy frameworks that balance tourism growth with ecological preservation and cultural integrity in rural areas.

Despite its contributions, this study has certain limitations, as it is based on a district-level case study, which may restrict the generalizability of the findings to other regions. Moreover, the reliance on qualitative methods suggests opportunities for future research to incorporate quantitative data to deepen empirical analysis. Further studies could explore policy formulation for rural ecotourism

management, mechanisms of stakeholder collaboration, and the effectiveness of environmental management strategies. Practical implications include the need for policies that strengthen sustainable ecotourism villages, empower local economies, and establish clear roadmaps for stakeholder cooperation. Overall, this research provides a foundation for future investigations and policy actions aimed at promoting the long-term sustainability of ecotourism villages in Indonesia.

7. Limitations of the Study and Prospects for Future Research

This study is limited to a case study of a tourist village in Poncoh, Indonesia. This restricts the scope for exploring tourist villages in other regions. The implementation of tourist villages in other parts of the world, such as Europe and the Americas, will differ from that in Indonesia, given the characteristics of Southeast Asian societies.

Declarations

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Author Contributions

1. Dewi Amanatun Suryani : Conceptualization (Lead); Data Curation (Lead); Formal Analysis (Lead); Funding Acquisition (Lead); Investigation (Lead); Methodology (Lead); Project Administration (Equal); Resources (Lead); Supervision (Supporting); Validation (Equal); Visualization (Equal); Writing – Original; Draft (Lead); Writing – Review & Editing (Supporting).
2. Purwanto Purwanto : Conceptualization; (Supporting); Data Curation (Supporting); Formal Analysis (Supporting); Funding Acquisition (Supporting); Investigation (Supporting); Methodology (Supporting); Project Administration (Equal); Resources (Supporting); Supervision (Lead); Validation (Equal); Visualization (Equal); Writing – Original Draft (Supporting); Writing – Review & Editing (Lead).
3. Hartuti Purnaweni: Conceptualization (Supporting); Data Curation (Supporting); Formal Analysis (Supporting); Funding Acquisition (Supporting); Investigation (Supporting); Methodology (Supporting); Project Administration (Equal); Resources (Supporting); Supervision (Lead); Validation (Equal); Visualization (Equal).
4. Tri Yuniningsih: Conceptualization (Supporting); Data Curation (Supporting); Formal Analysis (Supporting); Funding Acquisition (Supporting); Investigation (Supporting); Methodology (Supporting); Project Administration (Equal).
5. Amanda Elista : Conceptualization (Supporting); Data Curation (Supporting); Formal Analysis (Supporting); Funding Acquisition (Supporting); Investigation (Supporting); Methodology; Writing – Review & Editing (Lead).

Clinical trial number

Not applicable.

Ethics approval and consent to participate

This research has been approved by the Diponegoro Univeristy ethics committee and all procedures have been carried out in accordance with the guidelines and regulations of Diponegoro Univeristy . A formal ethical approval document has been issued by Diponegoro University and is available upon request. Informed consent was obtained from all participants. For respondents under 18 years of age, consent was provided by their legal guardians.

Consent to publish

The author has reviewed the final manuscript and consents to its publication.

Conflicts of interest

The authors declare no competing interests.

Data availability statements

The data supporting the findings of this study are available upon request from the corresponding author.

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Figures

Caption:

1. main zone entrance
2. reservation
3. stage
4. fishing pond
5. culinary area entrance
6. camping area
7. parking area
8. rescue post and meeting hall
9. prayer room and women's toilet
10. the joglo pusung
11. souvenir
12. reservoir entrance
13. men’s toilet
14. reservoir
15. fishing area
16. bridge
17. playing in the water



Figure 1

Pancoh tourist destination map

Note. Adapted from “Implementation of Ecotourism Concept in Masterplan Planning of Pancoh Ecotourism Village, Sleman, Yogyakarta,” by Vitasurya, V. R., Pudianti, A., Rudwiarti, L. A., Budianto, E., & Hartono, R. 2024, SENAPAS Proceedings, 2(1), 136–143. https://doi.org/https://doi.org/10.24002/senapas.v2i1.9248



2a. Outbond Package



2b. Surthong Package ii



2c. Surthong Package iii

Figure 2

Pancoh tour packages

Note. Adapted from "Desa Wisata Ekowisata Pancoh," by Jadesta, 2023, *Kemenparekraf RI* (https://jadesta.kemenparekraf.go.id/desa/66254)

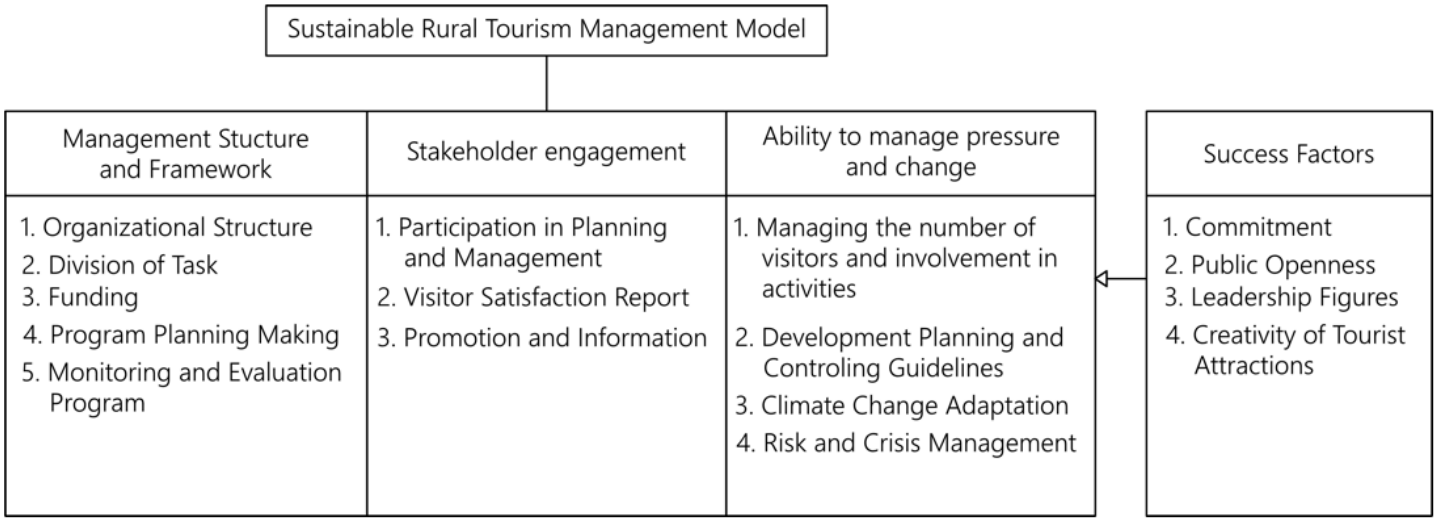


Figure 3

Sustainable village tourism management model