

CLUSTERING AS A STRATEGY FOR NATURE-BASED TOURISM: A STUDY IN RAMMANG-RAMMANG, INDONESIA

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Abstract

This study aims to analyze the clustering system of the Rammang-Rammang tourism area and to evaluate the roles, collaboration, challenges, and opportunities among stakeholders in supporting sustainable destination management. The research employs a qualitative approach that combines interviews with tourists, local communities, and village managers with direct field observations of facilities and activities. The findings indicate that the clustering system in Rammang-Rammang has naturally developed into several zones, including riverboat tourism, karst caves, village-based tourism, and culinary areas, each of which is interrelated and contributes to the identity of the destination. Tourists perceive the natural attractions as highly unique, yet they also note limitations in facilities and infrastructure. The interviews further reveal that local communities play a central role as guides and service providers, while village authorities coordinate governance and the government provides infrastructure support. Collaboration among stakeholders has been positive but remains hindered by weak coordination, limited funding, and low environmental awareness among some visitors. Nevertheless, opportunities for development are significant, particularly in strengthening local economic activities, adopting digital-based promotion, and integrating conservation into tourism services. The study concludes that clustering not only strengthens destination identity but also promotes more effective stakeholder collaboration and supports sustainable tourism practices. Recommendations include improving communication among stakeholders, establishing sustainable financing mechanisms, and adopting a stronger conservation-based approach to tourism management.

Keywords: clustering, nature-based tourism, stakeholder collaboration, sustainable tourism, rammang-rammang

1. INTRODUCTION

Clustering strategies in nature-based tourism are increasingly considered important because they can enhance the competitiveness of destinations while supporting environmental sustainability. Previous studies have shown that grouping tourist destinations enables better collaboration between industry players and greater efficiency in natural resource management (Spilanis & Vayanni, 2005). In addition, Krsak et al. (2019) mention that sustainable clustering can improve service quality and visitor satisfaction. Ghasemi et al. (2016) add that a community-based approach through clustering can strengthen destination identity and increase local community participation. Choibamroong (2019) emphasizes the importance of stakeholder involvement to ensure the sustainability of studied in depth. Therefore, this research is important to fill the literature gap and provide new insights for the development of nature-based tourism in Indonesia. Several previous studies have explored the application of clustering in nature-based tourism

Spilanis and Vayanni (2005) showed that clustering can increase the visibility and competitiveness of destinations in the global market. The research by Krsak et al. (2019) emphasizes that the principle of sustainability in clustering has a positive effect on service quality and visitor satisfaction. Ghasemi et al. (2016) found that community-based planning through clustering can strengthen destination identity and local community participation. Meanwhile, Choibamroong (2019) emphasizes the importance of a stakeholder approach to ensure the sustainability of this

strategy. However, research that specifically evaluates the application of clustering in Rammang-Rammang is still very limited. Thus, this study aims to fill this gap and contribute to the development of nature-based tourism literature in Indonesia.

Rammang-Rammang, located in Maros Regency, South Sulawesi, is a natural tourist destination with enormous potential. However, the management of this destination faces a number of significant challenges. According to a report by Mongabay Indonesia (2022), despite its outstanding natural beauty, the management of the tourist destination in Rammang-Rammang is not yet optimal. Some of the main problems include a lack of coordination between stakeholders, minimal supporting infrastructure, and low community involvement. In addition, ineffective promotion and marketing have prevented the full exploitation of the area's tourism potential. These issues highlight the need for an appropriate management strategy to maximize the natural tourism potential of Rammang-Rammang. With the right strategy, it is hoped that this destination can develop sustainably while improving the welfare of the local community.

This study aims to analyze the application of clustering strategies in the development of nature-based tourism in Rammang-Rammang. A qualitative approach was used to explore how clustering can enhance collaboration among stakeholders, strengthen destination identity, and increase local community participation. The research location was chosen because Rammang-Rammang has extraordinary natural potential, but its management still faces various challenges. The results of this study are expected to provide strategic recommendations for the development of nature-based tourism in Rammang-Rammang and other destinations in Indonesia. In addition, this study is also expected to contribute to the literature on the application of clustering in nature-based tourism. Thus, this study is highly relevant to the development of sustainable tourism in Indonesia.

Clustering is a data grouping technique used to identify and group objects or areas based on similarities in certain attributes or characteristics, so that objects in one group have greater similarities than objects in other groups. Yalçinkaya & Güzel (2019) Argue, Clustering in the context of tourism is understood as the grouping of geographically concentrated tourism activities that share similar characteristics and functions, which aims to foster cooperation, development, competitiveness, and strategic positioning. Mirčetić (2019) argue, Clustering refers to a concentration of interconnected tourism enterprises and institutions that are deliberately grouped to enhance competitiveness and strengthen the strategic positioning of a destination. Kachniewska (2013) argue, Clustering in tourism is defined as a geographically concentrated group of tourism enterprises both SMEs and large organizations that collaborate in order to increase innovation and competitiveness within a local tourism area. Estêvão et al., (2017) argue, Tourism clustering is explained as a group of companies located near one another geographically, connected with specific suppliers, service providers, and other related institutions that interact to facilitate cooperation and efficiency. Fundeanu (2015) Argue, Clustering functions as a strategic tool in regional tourism development that identifies patterns of cluster formation based on a destination's potential, diversity, and local strengths. Nordin (2003) argue, Clustering is described as a theoretical approach intended to promote innovation and competitiveness in the tourism industry by integrating various operators into one coordinated management system.

Zoning in Rammang-Rammang based on activity types is a crucial strategy to ensure that each tourism area, such as caves, rivers, and hill regions, is managed without harming the ecosystem. The clustering approach promotes collaboration among businesses, local guides, and surrounding communities, creating a more integrated tourism experience that aligns with the area's natural and cultural characteristics. This strategy helps enhance management innovation, destination competitiveness, and the sustainability of ecotourism in the Rammang-Rammang area. Laing, & Lewis (2017) argue, this article discusses destination development strategies through a cluster approach, emphasizing the importance of collaboration among stakeholders in creating integrated and sustainable tourism experiences. This approach can be applied in Rammang-Rammang to group tourist attractions based on their natural and cultural characteristics. Ágnes, F. (2009) argue, this article discusses the importance of cluster development in the ecotourism sector to enhance innovation and competitiveness. The emphasis on collaboration between businesses and local

stakeholders is relevant for the development of sustainable nature-based tourism. “One of the key strategies to develop in any Tourism Development Plan consists of structuring the territory in different areas according to the kinds of activities to be carried out in each one. The clustering strategy is essential for the tourism development regardless of the dimension of the territory: clusters exist within countries, regions and even towns” (Trelohan, 2022).

The cluster strategy in Rammang-Rammang can support local socio-economic development, strengthen collaborative networks, and enhance innovation in nature-based tourism products. The cluster structure in the Rammang-Rammang area provides a framework for efficient destination management, including the division of activity and conservation zones, which are crucial for ecologically sensitive areas. Gutiérrez & Palacios (2021) argue, the formation of nature-based tourism clusters can encourage sustainable development through collaboration between local stakeholders and the integration of economic activities with environmental conservation. Geng, et al (2021) argue, Recent research shows that cluster formation in sustainable rural tourism is very important to organize areas based on the type of tourism activity, such as ecotourism, agritourism, and cultural tourism, so that the development of nature-based destinations is more structured and effective. Gupta, et al (2023) argue, management of nature-based tourism clusters in protected areas has been proven to increase economic benefits for local communities, especially when the approach implemented considers the integration between nature conservation and tourism activities.

Nature-based tourism emphasizes sustainable management by considering environmental conservation, community empowerment, and visitor preferences to maintain ecosystems and destinations. The application of innovations, including digital technologies and visitor activity specialization, can enhance management efficiency and provide high quality tourism experiences. Davie et al, (2024) argue, this article discusses how communities can utilize nature-based tourism to enhance destination marketing while empowering local residents, using social capital theory to assess its impact on community development and destination management strategies. Milojković, & Eker (2023) Argue, Nature-based tourism management focuses on environmental conservation and sustainable local socio-economic development, emphasizing careful management of areas to protect the ecosystem. Huamanchumo, et al, (2024) Argue, Nature-based tourism is an essential part of ecotourism and sustainable tourism, rapidly developing with an emphasis on integrating environmentally friendly tourism activities and conservation to maintain the sustainability of destinations. Stemmer, K. (2023) argue, this study analyzes how activity specialization affects preferences for nature-based tourism products, highlighting the role of visitor skills or expertise in determining the type of tourism activities they choose. Sanchez (2025) argue, this article explores the use of digital technologies in managing nature-based tourism through a scientometric approach, focusing on the latest trends and technological innovations in the sector.

The zoning strategy allows for the development of nature tourism without damaging sensitive areas in Rammang-Rammang. Local community involvement increases the desirability and economic benefits of nature-based tourism in Rammang-Rammang. “Tourism clustering refers to the geographical concentration of tourism-related activities that are grouped under similar characteristics and functions to foster cooperation, development and competitiveness.” (Yalçinkaya & Güzel 2019 :28). Ginting et al, (2023) argue, active community participation in nature-based tourism management can increase tourism and economic benefits. A case study in Balige demonstrates the importance of community involvement in decision-making and tourism infrastructure development. Petrić, & Mandić (2014) argue, Various visitor management tools can be implemented in protected areas to maintain a balance between tourist visits and environmental conservation. Implementing these tools in Rammang-Rammang can help regulate visitor flow and protect the karst ecosystem. (Wijaya & Yuliana 2024) argue, Rural development plays a crucial role in supporting community-based tourism, fostering local empowerment, and sustainable destination growth. Sanjaya & Wicaksono (2024) argue, digital green marketing campaigns and tourists' environmental beliefs influence pro-environmental behavior and revisit intentions to ecotourism destinations. Implementing this strategy in Rammang-Rammang can increase tourists' awareness and environmentally friendly behavior.

The grouping of natural tourism destinations through clustering strategies is very important in the development of nature-based tourism. Laing and Lewis (2017) emphasize that the application of clustering strategies in the development of tourist destinations can increase the attractiveness and economic sustainability of rural communities. They state that collaboration between various elements in the cluster can create synergies that are beneficial to all parties. Furthermore, Krsak et al. (2019) show that clustering based on sustainability principles can improve service quality and visitor satisfaction. Ghasemi et al. (2016) add that community-based tourism planning through clustering can strengthen destination identity and increase local community participation. Choibamroong (2019) highlights the importance of a stakeholder approach in clustering strategies to ensure the sustainability of nature-based tourism. Thus, clustering is not only beneficial from an economic perspective, but also from a social and environmental perspective.

Clustering strategies also have a positive impact on the marketing and promotion of natural tourist destinations. Spilanis and Vayanni (2005) argue that clustering tourist destinations can increase the competitiveness and visibility of destinations in the global market. They state that collaboration between destinations within a cluster enables more effective and efficient joint promotion. Ulinnuha et al. (2020) show that behavior-based clustering of tourists can assist in market segmentation and marketing strategy adjustment. Kim et al. (2020) add that the use of information technology in clustering can improve tourist experiences and operational efficiency. Thus, clustering not only increases the attractiveness of destinations but also improves efficiency in marketing and tourist services

2. RESEARCH METHODOLOGY

This study uses a qualitative approach because it aims to gain an in-depth understanding of the application of clustering strategies in nature-based tourism development. This approach allows for the exploration of the perceptions, experiences, and views of stakeholders regarding tourism destination management (Lochrie, Curran, & O'Gorman, 2015). According to Movahed et al. (2015), qualitative methods are effective for exploring social dynamics and interactions in the context of tourism clusters. This approach also provides rich and descriptive data, enabling a comprehensive description of actual conditions in the field. In addition, qualitative methods are flexible in adapting to the complexity and dynamics of the field (Seetaram, Dwyer, & Gill, 2012). Therefore, a qualitative approach was chosen so that the research could capture the relevant social, economic, and cultural nuances in the application of clustering strategies in Rammang-Rammang.

Data was collected through in-depth interviews, participatory observation, and documentation studies, in accordance with the methods recommended by Lochrie et al. (2015). Interviews were conducted with destination managers, local businesses, and local communities to obtain information about clustering strategies, obstacles, and best practices. Field observations were used to observe interactions between stakeholders directly. Documentary studies included official reports, tourism statistics, and publications related to the management of Rammang-Rammang. The research location was chosen in Rammang-Rammang, Maros Regency, South Sulawesi, because it has high natural potential but its management still faces challenges (Movahed et al., 2015). This combination of techniques allows for data triangulation, so that the information obtained is more valid and accountable.

The data were analyzed descriptively and qualitatively using the SWOT (Strengths, Weaknesses, Opportunities, Threats) method to assess the internal and external factors that influence clustering (Movahed et al., 2015). SWOT analysis helps identify internal strengths and weaknesses as well as opportunities and threats from the external environment. This approach also allows researchers to develop realistic and contextual recommendations for nature-based tourism development. Each finding was analyzed systematically and compared with relevant literature. Data validation was carried out through triangulation between interviews, observations, and documentation. With this method, the study was able to provide accurate and practical conclusions.

3. RESULT AND DISCUSSION

Rammang-Rammang, located in Maros Regency, South Sulawesi, is recognized as one of the largest karst landscapes in the world and offers an extraordinary natural tourism appeal. The limestone cliffs, winding rivers, natural caves, rice fields, and the traditional village of Berua together form the unique identity of this destination. Its location, approximately forty-five minutes from Makassar, makes Rammang-Rammang easily accessible to both domestic and international visitors. The main tourist activities include taking a traditional boat ride along the Pute River, exploring karst caves, trekking to panoramic viewpoints, and interacting with local communities in the tourist village. This natural potential reinforces the position of Rammang-Rammang as one of the leading nature-based destinations in South Sulawesi.

Nevertheless, several challenges continue to hinder the optimal management of this destination. Based on observations and interviews, public facilities such as toilets, trash bins, and information boards remain limited and poorly maintained. Supporting infrastructure, including internal access routes to key tourist spots, is still inadequate, which reduces visitor comfort. Promotional activities are also still relatively simple and have not yet reached a wider market. These conditions highlight that while the main attraction lies in the authenticity of the landscape and social interaction, without the strengthening of facilities and marketing strategies, the competitiveness of Rammang-Rammang will be difficult to sustain in the long term. Bayang has a strong opportunity to compete as a leading marine tourism destination at both the regional and national levels.

3.1 *The Roles of and Clustering Strategi in Rammang-Rammang*

The findings show that management in Rammang-Rammang has been increasingly structured through a clustering approach. Zones of tourist activity are divided into several groups according to natural and social characteristics. River tourism has emerged as the most prominent cluster, where traditional boats operated by local communities transport visitors along the Pute River. The karst caves are utilized for adventure and educational tourism, managed by local guides who are knowledgeable about the ecosystem. Berua Village serves as the cultural cluster, offering traditional community life, simple homestays, and local cuisine. Meanwhile, the culinary zone near the entrance to the site provides food and services that directly benefit the local economy.

According to interviews with a site manager, local communities act as the most dominant stakeholders, playing roles as tour guides, boat operators, and providers of homestays and culinary services. The local government supports the destination through road construction and regulatory frameworks, although its contribution is limited due to budget constraints. Academic institutions contribute through research and training that help enhance local capacity. The private sector is still minimally involved, but there is significant potential for small- and medium-scale investment in eco-friendly facilities. This collaborative arrangement reflects a form of community-based tourism aligned with sustainability principles. Clustering not only distributes tourist flows more evenly but also clarifies stakeholder roles and prevents overexploitation of particular sites.

3.2 *Challenges and Opportunities*

The interview results confirm that waste management remains the most pressing challenge in Rammang-Rammang. During peak visitation, particularly weekends and holidays, the volume of waste often exceeds management capacity, which reduces visitor comfort and threatens the karst ecosystem. Another major issue is the weak coordination among stakeholders, evident in overlapping responsibilities between boat groups, village authorities, and the local government. Financial limitations are also critical, as most operational costs are borne by community groups through informal arrangements with no sustainable funding schemes. In addition, low environmental awareness among certain visitors further exacerbates the situation.

On the other hand, Rammang-Rammang holds considerable opportunities for development as a sustainable nature-based tourism destination. Tourism activities have created new economic opportunities for local residents, ranging from food stalls to homestays, with direct positive impacts on community welfare. The use of digital platforms for promotion is increasingly feasible, particularly through social media, which can expand both domestic and international markets. Cross-sector collaboration among government, communities, academics, and entrepreneurs also serves as a vital asset to strengthen destination management. Furthermore, the application of ecotourism principles through clustering can safeguard the karst environment while providing authentic visitor experiences. Thus, clustering is not only a management instrument but also a means of building a strong and sustainable destination identity.

4. CONCLUSION

This study concludes that clustering is an effective approach to supporting nature-based tourism management in Rammang-Rammang. The division of the area into clusters of river tourism, karst caves, village-based tourism, and culinary activities allows for a more balanced distribution of visitors and reduces pressure on fragile ecosystems. Collaboration among stakeholders, particularly the involvement of local communities as primary managers, has contributed significantly to destination sustainability. Although challenges persist, including inadequate facilities, weak coordination, and financial constraints, there are substantial opportunities through community empowerment, digital promotion, and conservation-oriented ecotourism.

The study recommends strengthening cross-sector communication, adopting sustainable financing mechanisms, and enhancing community capacity through training and mentorship. If these measures are effectively implemented, Rammang-Rammang has the potential to become a model of sustainable nature-based tourism management in Indonesia, capable of generating economic benefits for local communities while preserving the global karst heritage.

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