



GIS-based Mapping of Tourism Village Destination Components: Survey of Karangrejo Tourism Village, Magelang

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Abstract

This research aims to conduct GIS-based mapping of tourism village destination components, with a focus on Karangrejo Tourism Village, Magelang. Village tourism is an important sector for rural economic development but needs to be well-planned and managed to avoid negative impacts. This research uses a mapping approach to identify and evaluate destination components, including attractions, accommodation, accessibility, and amenities. Through spatial data analysis and interviews with relevant stakeholders, this research generates an in-depth understanding of the distribution and availability of destination components in Karangrejo Village. The results show that this village has a variety of natural and cultural attractions, varied accommodations, and adequate amenities. The destination component distribution map consists of spatial and non-spatial data to be a useful tool for destination managers and tourists to plan and explore the various locations and experiences offered by Karangrejo Village. The implications of this research include the development of sustainable rural tourism, taking into account environmental, social, and economic aspects. Despite its value, the generalizability of the findings is limited to the specific context of the village, and further research is needed to deepen the understanding of the challenges and opportunities in rural tourism development.

Keywords: GIS, Karangrejo, Mapping, Tourism Village.

INTRODUCTION

Rural tourism has become an important sector for many rural communities, offering opportunities for income generation, employment, as well as cultural exchange. However, poorly planned and managed tourism can have negative impacts such as environmental degradation, cultural erosion, and pressure on local resources. According to (Fafurida et al., 2023) Destination component mapping offers a structured approach to identify and assess the various elements that contribute to the tourist experience as well as the sustainability of a tourist village. According to (Banella et al., 2024). This process begins with a comprehensive assessment of the village's natural and cultural resources, including the landscape, wildlife, cultural traditions, handicrafts, and local way of life. According to (Banella et al., 2024; Galvagno & Giaccone, 2019) mapping helps identify unique attractions that can attract tourists while highlighting the need for conservation and preservation efforts.

Next, an evaluation of the built environment such as accommodation facilities, transportation infrastructure, utilities, and public spaces is conducted (Brandon et al., 2003; Fang et al., 2021). This step helps identify gaps and areas of improvement to

enhance the traveler experience and ensure accessibility for different types of travelers. According to (Bosch et al., 2023; Yhee et al., 2023) Community resources, such as the friendliness of residents, involvement in tourism activities, and willingness to share their way of life, are also evaluated. According to (Muchlis et al., 2024; Wang et al., 2022; Zatori et al., 2018) These aspects are important to create authentic and enriching experiences for tourists while empowering local communities and ensuring tourist participation in the tourism industry.

In evaluating tourism destinations, it is important to take into account not only physical infrastructure such as accommodation and transportation facilities, but also other facilities and services such as restaurants, shops, recreational facilities, tour guides, and information centers. According to (Prihartanto & Priyanka, 2023) Facilities and services such as restaurants, shops, recreational facilities, tour guides, and information centers are also mapped to assess their adequacy and quality. According to (ElSheikh et al., 2010; Yeniay & Sik, 2022) this information can help in identifying areas for investment and improvement to meet tourists' needs and expectations. In addition, according to (Kuklina et al., 2022) accessibility factors



such as transportation routes, directions, and availability of information are assessed to ensure the tourist village is easily accessible and passable by tourists. Marketing and promotion strategies according to (Nurmadewi, 2024; Vaculčíková et al., 2020) are reviewed to evaluate the effectiveness of branding, advertising, and online presence in attracting potential tourists to tourist villages. Finally, according to (Quang et al., 2023) policies, regulations, and management and planning efforts are analyzed to ensure the sustainable development and management of tourist villages, balancing economic benefits with environmental and cultural preservation.

The mapping of tourism destination components aims to gain a comprehensive understanding of destination conditions. According to (Quang et al., 2023) By mapping these destination components, stakeholders can gain a comprehensive understanding of the strengths, weaknesses, opportunities, and threats of the tourism village. According to (Sarıkaya Levent et al., 2024) This information can then be used to develop targeted tourism development plans, allocate resources effectively, and enhance the tourist experience while protecting the destination's cultural and natural heritage.

The lack of spatial data is one of the problems faced by tourist villages in the process of mapping destination components. According to (Nistor & Nicula, 2021) Spatial data is very important to understanding the distribution and location of various destination components such as natural resources, culture, infrastructure, facilities, and others. According to (Jamaluddin Jahid et al., 2023) Without spatial data, it is difficult to know the location and distribution of natural resources, culture, and tourist attractions owned by the village, hampering the process of identifying and optimally utilizing resource potential. Planning infrastructure and tourism facilities that are not on target. (Hajar et al., 2022) revealed that the absence of spatial data can lead to the development of infrastructure and tourism facilities that are not by the needs and strategic locations. Thus, the absence of spatial data is a major obstacle for tourist villages in mapping destination components, hampering the understanding of the distribution of natural resources, culture, and tourist attractions and making it difficult to plan targeted tourism infrastructure and facilities.

Spatial data helps integrate the development of tourism villages with larger spatial plans, such as districts or provinces. According to (Andri & Dunan, 2023) Without spatial data, it is difficult to communicate the location and access to tourist villages to potential tourists, as well as effectively promote tourist attractions. According to (Hammar et al., 2021) Lack of spatial data can make it difficult to identify and map community resources, such as handicrafts, traditions, and cultural activities that can engage communities in tourism. To address this issue, tourist villages must invest in the collection and creation of spatial data. This can be done by utilizing technologies such as GPS, participatory mapping, or even using remote sensing data if possible (Agus & Ridwan, 2019; Jasman & Ridwan, 2020). Accurate and comprehensive spatial data will aid in more effective mapping of destination components, as well as support sustainable tourism planning, promotion, and management in tourist villages (Ridwan et al., 2023; Widjaja et al., 2021).

Karangrejo Village is one of the tourist villages located in Borobudur District, Magelang, Central Java. The designation as a tourist village is officially stated through the Decree of the Head of the Tourism and Youth Sports Office of Magelang District Number 188.4/44/KEP/19/2017 and Regent Decree Number 180.182/175/KEP/19/2018. The Balkondes program in the villages around Borobudur contributes to realizing sustainable tourism. According to (Edwin et al., 2019), tourism activities in the villages around Borobudur Temple contribute to socio-cultural changes in the community. In line with (Farhan et al. Alfidrus, 2023), who found that the empowerment program through tourism activities received majority support from the community around Borobudur Temple through real participation consciously and responsibly. Based on the results of monitoring in the field (Interview and Observation, May 9, 2024), Karangrejo Village needs a mapping of the components of a tourist village to support the development of the area as a superior destination.

This research aims to map the components of Karangrejo tourism village, Borobudur, Magelang. The indicators used according to (Fennell & Cooper, 2020) are the 4A Components including attractions, accommodation, accessibility, and amenity. While mapping the components of the Tourism Village this



research is based on GIS (Geographic Information System). According to (Ghorbanzadeh et al., 2019) GIS is a useful approach in planning, managing, and developing tourist villages. By using GIS, research results can integrate spatial data and non-spatial attributes of tourist village components to create rich visualizations and in-depth analysis (Agus & Ridwan, 2019).

METHODS

This research aims to map Karangrejo tourism village based on GIS (Geographic Information System). GIS is a research approach used to collect and analyze spatial data (Agus & Ridwan, 2019; Goodchild & Haining, 2004). The commonly used research method is a field survey to collect primary data involving direct observation of Karangrejo tourism village. Activities carried out include measuring with GPS (Global Positioning System), recording coordinates, and collecting attribute data such as infrastructure conditions, facilities, and natural resources. Once spatial data is collected, spatial analysis is conducted using GIS software to produce thematic maps and relevant information. Spatial analysis may include map overlay, network analysis, spatial analysis, and spatial modeling. The results of this analysis can be used for planning and development of tourism villages, such as determining the location of new infrastructure, zoning areas, and resource management. This research also seeks to obtain information about the existence of GIS (Geographic Information System) utilization in Karangrejo tourism village. To obtain an overview of GIS utilization, this research uses an interview method with representative informants (Lexy J. Moleong, 2019). The informants of this research are Karangrejo Tourism Village Management and Tourists who were met during the research. Survey and Interview on May 9-12, 2024.

RESULTS AND DISCUSSION

This research aims to map the components of Karangrejo tourism village, Borobudur, Magelang, based on the 4A indicators: attractions, accommodation, accessibility, and amenities. The

research method uses GIS to collect and analyze spatial data, as well as interviews with related parties. Based on the field survey, Karangrejo Village has a variety of destination components available to tourists, including natural and cultural attractions, diverse accommodations, amenities such as restaurants and souvenir shops, and good accessibility through public transportation and clear directions. This makes Karangrejo Village an attractive destination for tourists who want to experience authentic Central Javanese rural life. First, Attractions, As the main attraction, Borobudur Temple attracts many tourists to Karangrejo Village. Its existence is the main attraction for visitors, with tour guide facilities available. Natural Environment: Karangrejo Village also has attractive natural beauty, such as hills, rice fields, and small rivers. Visitors can enjoy activities such as trekking, cycling, and picnicking in the green natural environment.

Second, Accommodation: Village Balconies: Karangrejo Village has several village balconies that provide accommodation for tourists. These simple lodging facilities are suitable for travelers looking for an authentic stay close to local life. Some villagers also provide homestays for travelers who want to experience the daily life of the locals. These homestays offer a more personalized and interactive stay. Third, Amenity, Karangrejo Village has various warungs and restaurants that serve local and international cuisine. Visitors can enjoy authentic local cuisine and sample Central Javanese specialties. Several souvenir shops sell local handicraft products and unique souvenirs. Tourists can buy souvenirs as a memento of their visit to the village. Fourth, Accessibility, Karangrejo Village can be accessed through public transportation such as buses and rural transportation. There are also motorcycle taxis and taxi services that make it easier for tourists to get around the village and to the nearest tourist attractions. In addition, there are also clear directions available to the main attractions such as Borobudur Temple and other accommodations in Karangrejo Village. This makes it easy for tourists to explore the village without difficulty.



Table 1. Availability of Attraction, Amenity, and Accommodation Components of Karangrejo Tourism Village

Accommodation and Amenity Availability	Component	Total
Balkondes Karangrejo	Accommodation	1
Borobudur Luxury Glamping	Attractions	1
Bukit Baredo	Attractions	1
Bukit Rhema Gereja Merpati Putih	Attractions	1
Cafe	Accommodation	1
Cottage Ndalem Setumbu	Accommodation	1
Craft Ukir	Amenity	1
Homestay	Accommodation	23
Karangrejo Homestay	Amenity	1
Village Office	Amenity	1
Coffee Shop	Accommodation	1
Crafting	Accommodation	1
Ireng craft	Attractions and Amenity	1
Museum Art	Attractions and Amenity	1
The Hall	Accommodation	1
Photograph	Attractions and Amenity	1
The Hill "Punthuk Setumbu"	Attractions	1
Food House	Accommodation	6
Restaurant and Bamboo Carving	Attractions and Amenity	1
Art Studio	Attractions and Amenity	1
Souvenir	Attractions and Amenity	4
Traditional Spa	Attractions and Amenity	1
Ancient River	Attractions	1
Fruit Garden	Attractions	1
The Heritage Convention	Attractions and Amenity	1
Truntum Borobudur	Attractions and Amenity	1
Villa Omah Opung	Accommodation	1
VW Tour	Attractions and Amenity	1
Borobudur ATV Rides	Attractions and Amenity	1

Source: Researcher, 2024

Table 1 presents the availability of various attractions, amenities, and accommodation components in Karangrejo Tourism Village. It can be seen that: There is a variety of accommodation available, including homestays, cottages, villas, and balconies, with homestays being the most common option. Available attractions include places such as Borobudur Temple View, hills, rivers, and other natural attractions. Amenities include warungs, restaurants, souvenir shops, art studios, and traditional spa facilities. The availability of these components shows

the diversity and great potential of Karangrejo Tourism Village in attracting tourists and providing a diverse experience for tourists. The availability of the 4A components (Attractions, Amenities, Accommodation, and Accessibility) in Karangrejo Tourism Village plays a role in increasing visitor satisfaction. In line with research (Jehamin et al., 2023; Zulpan et al., 2023) the availability of adequate 4A components plays an important role in creating a positive and satisfying tourism experience for visitors. By having attractive attractions, complete amenities, comfortable



accommodations, and good accessibility, tourist destinations can increase visitor satisfaction and build a good reputation in the tourism industry (Dewandaru et

al., 2021; Fitriana et al., 2020; Ismail & Rohman, 2019).

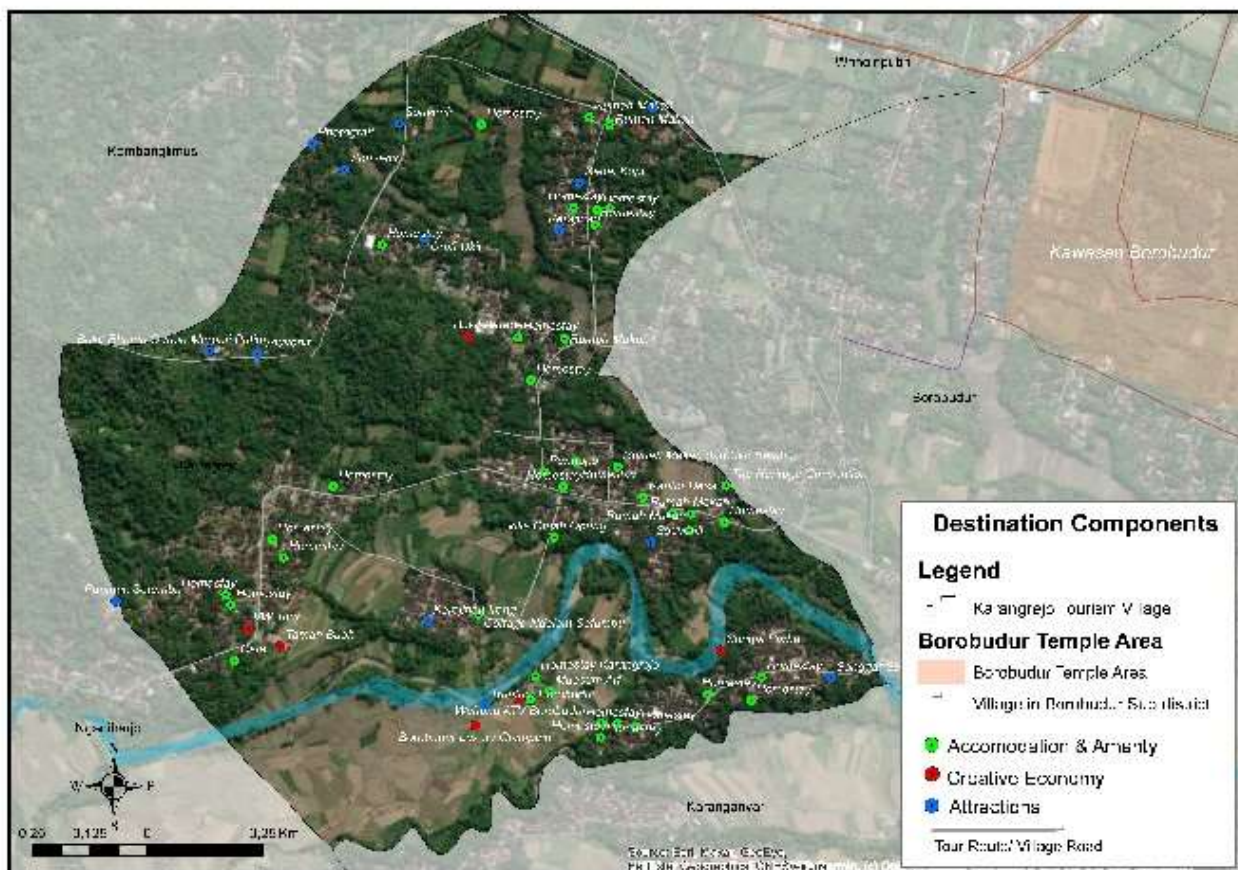


Figure 1. Map of Distribution of Destination Components of Karangrejo Village

Source: Researcher, 2024

Figure 1 is the Karangrejo Village Destination Component Distribution Map that includes all the essential elements for a complete tourism experience. This map displays the location and distribution of various destination components, including accommodation, attractions, accessibility, and amenities, located throughout the Karangrejo Village area. On this map, it can be seen that homestay facilities are evenly distributed throughout the village area, indicating a wide availability of accommodation for visitors. This reflects the effort to provide an authentic and close-to-local-life stay experience for tourists. In addition, it is also seen that accessibility to various attractions and amenities is supported by a network of village roads and farm roads that connect various locations in the village. This makes it possible to create a tour package around the village, where visitors can enjoy the beautiful rural atmosphere, including rice fields, gardens, and the activities of the

farming community. The availability of accessibility data can be utilized to develop travel patterns in the village (Susanto et al., 2023). The Karangrejo Village Destination Component Distribution Map is a useful tool for destination managers and tourists to plan and explore the various locations and experiences offered by Karangrejo Village. By providing visual information about the distribution of destination components, this map assists in promoting the village's tourism potential and enhancing a diverse and satisfying tourism experience for visitors (Jasman et al., 2023).

The availability of the Karangrejo tourism village map can be used as a reference material for zoning the area. According to (Hamzah & Irfan, 2018) Zoning of tourist village areas aims to create a balanced and sustainable environment, which supports responsible tourism development and ensures long-term benefits for all stakeholders. Zoning helps protect the natural



resources and cultural heritage of the village by identifying areas that are sensitive or ecologically and culturally important. According to (Baloch et al., 2023) by restricting activities that could potentially harm the environment or damage cultural heritage, zoning helps to ensure that the village remains sustainable and maintains its uniqueness and appeal to tourists. Maps can improve the quality of the tourist experience.

The results of interviews with informants as tourists. This is by the following interview quote (May 11, 2024/MH) “Maps are a very important tool in enhancing the traveler experience in this destination. With a clear visual guide to the location of attractions, amenities, and accommodations, travelers can plan their trip more efficiently and ensure that they don't miss out on anything important. In addition, maps also help in understanding the topography and structure of the region, providing additional insight into the potential experiences that can be enjoyed in this destination. By having an accurate and informative map, travelers can feel more confident and satisfied during the trip, thus improving the overall quality of the experience in this tourist village”.

The interview results show that the use of maps is not only a practical tool for navigation but also has a significant impact on improving the overall quality of the tourist experience in tourist destinations. According to (Atit et al., 2016) Maps also assist tourists in understanding the topography and structure of the destination area. Information about the relief and geographic distribution of various attractions and amenities provides additional understanding of the potential experiences that can be enjoyed in the destination. The availability of maps makes it possible to allocate areas for different types of tourist activities, such as main attractions, accommodation, dining, and leisure activities. By ensuring that each zone has a distinct focus and characteristics, zoning can improve the quality of the tourist experience by offering a diverse range of activities and options that suit tourists' interests and preferences (Afriza et al., 2020; Maryani & Indrianty, 2021).

This research has broad implications for the development of sustainable rural tourism, ensuring that tourist villages such as Karangrejo can optimally utilize tourism potential while maintaining the environment and culture. GIS-based destination component mapping can be an effective tool for sustainable rural tourism

management and development (Nyompa et al., 2023). With a deep understanding of the distribution and availability of attractions, amenities, accommodation, and accessibility, tourism managers can plan for sustainable development, considering environmental, social, and economic sustainability aspects.

Limitations This research was only conducted in Karangrejo Village, so the generalization of findings is limited to the specific context of the village. This reduces the representativeness of the research results in the context of a broader scale, such as a district or national area. A more comprehensive study involving several tourist villages could provide a deeper understanding of the challenges and opportunities in rural tourism development. In addition, this study only focuses on the 4A components (Attractions, Amenities, Accommodation, and Accessibility). Although these components are important in enhancing the tourist experience, more comprehensive research may need to consider other factors such as environmental sustainability, local community participation, and tourism marketing strategies.

CONCLUSION

This research provides an in-depth understanding of the importance of GIS-based mapping of tourism village destination components in the development of sustainable rural tourism. Limited spatial data is a major obstacle in mapping destination components, hindering the understanding of the distribution of natural, cultural, and tourist attraction resources and making it difficult to plan targeted tourism infrastructure and facilities. Therefore, investment in spatial data collection and generation is essential to support tourism development. This research results in GIS data in the form of spatial data and non-spatial attributes can be integrated to create rich visualizations and in-depth analysis. GIS-based destination component mapping can be an effective tool in sustainable rural tourism management and development. With a deep understanding of the distribution and availability of attractions, amenities, accommodations, and accessibility, tourism managers can plan for sustainable development, considering environmental, social, and economic sustainability aspects.

This research provides an in-depth understanding of the importance of GIS-based mapping of tourism



village destination components in the development of sustainable rural tourism. Limited spatial data is a major obstacle in mapping destination components, hindering the understanding of the distribution of natural, cultural, and tourist attraction resources and making it difficult to plan targeted tourism infrastructure and facilities. Therefore, investment in spatial data collection and generation is essential to support tourism development. This research results in GIS data in the form of spatial data and non-spatial attributes can be integrated to create rich visualizations and in-depth analysis. GIS-based destination component mapping can be an effective tool in sustainable rural tourism management and development. With a deep understanding of the distribution and availability of attractions, amenities, accommodations, and accessibility, tourism managers can plan for sustainable development, considering environmental, social, and economic sustainability aspects.

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