"DEVELOPMENT OF THE GILI MANDANGIN TOURIST AREA BASED ON RESILIENCE, THROUGH SMART CITY METHODS AND CONNECTIVITY"

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ABSTRACT

Gili Mandangin, a small island in Sampang Regency, Madura, has great potential to develop into an attractive tourist destination with its natural beauty and cultural richness [1] However, challenges such as limited infrastructure, vulnerability to climate change, and low connectivity levels hinder the maximization of that potential. This research aims to formulate a resilience development strategy based on tourism in Gili Mandangin by applying the Smart City concept [2] and the enhancement of connectivity among stakeholders.

The research method used involves qualitative analysis through literature studies, interviews with relevant parties, and field observations to understand the conditions and challenges faced. The Smart City approach [2] is proposed as a solution to leverage technology in resource management, improve information access, and enhance system integration in the tourism sector. In addition, the improvement of connectivity [3]. among local communities, industry players, and the government is seen as an important step to create a sustainable and resilient tourism ecosystem.

The implementation of Smart City in Gili Mandangin can strengthen tourism resilience by optimizing destination management, improving public service efficiency, and expanding market access for local products [4]. Better connectivity enables effective coordination in facing economic and environmental challenges, as well as encouraging community participation in the development of sustainable tourism. This strategy is expected to enhance the competitiveness of Gili Mandangin as an adaptive and innovative tourist destination in the digital era.

Keywords: *Resilience, Gili Mandangin Tourism, Smart City, Connectivity, Sustainable Development.*

INTRODUCTION

Indonesia is an archipelagic country with abundant natural and cultural wealth, making it one of the world's potential tourist destinations. One of the areas with great potential to be developed as a tourist destination is Gili Mandangin Island, located in Sampang Regency, Madura. Gili Mandangin is known for its natural beauty and unique cultural richness, which, if managed well, can become a magnet for both local and international tourists.[1]

However, the development of the tourism sector in Gili Mandangin is not easy and faces a number of complex challenges. These challenges include limited infrastructure, vulnerability to climate change, and low connectivity levels that hinder accessibility and

overall development of the region. [9] These factors are the main obstacles in maximizing the tourism potential of Gili Mandangin. Therefore, an innovative and integrated approach is needed to overcome these obstacles and create sustainable development strategies[5].

One of the approaches considered capable of addressing these challenges is the Smart City concept. The Smart City concept aims to enhance the efficiency of resource management, improve access to information, and optimize technology in the daily lives of the community, including in the tourism sector. Through the application of technologies such as the Internet of Things (IoT), Big Data, Artificial Intelligence (AI)[6], and the enhancement of digital connectivity, Gili Mandangin is expected to become a more adaptive and sustainable tourist destination, in line with the 100 Smart City Movement program initiated by Kominfo in 2017. [2]

In addition, improving connectivity between the local community, the government, and industry players is also a key element in the sustainable tourism development in Gili Mandangin. [4] Good connectivity does not only mean adequate physical infrastructure, but also includes digital and social connectivity that enables closer interaction among all stakeholders. This will strengthen coordination in facing economic, social, and environmental challenges, as well as encourage active community participation in the preservation and development of tourist destinations. As done by the Expert Council of the Association of the Indonesian Tours and Travel Agencies (Asita) (Asnawi;2022), one of the current brands of Indonesia is Mandalika, located in West Nusa Tenggara. (NTB). However, the destination is not just Mandalika and Bali; Gili Mandangin itself must rise with various natural potentials such as marine tourism and wellness tourism.

This research aims to formulate a resilience-based tourism development strategy in Gili Mandangin by prioritizing the implementation of the Smart City concept and enhancing connectivity among stakeholders. This research uses a qualitative approach through literature studies, interviews with relevant parties, and field observations to gain an in-depth understanding of the current conditions and challenges faced by Gili Mandangin. Through this strategy, it is hoped that Gili Mandangin will be able to face the challenges of environmental and economic changes, as well as enhance its competitiveness as a resilient and innovative tourist destination in the digital era.

By implementing the Smart City concept and strengthening connectivity, Gili Mandangin is expected not only to enhance the quality of public services and comfort for tourists but also to strengthen resilience in facing the impacts of climate change and economic
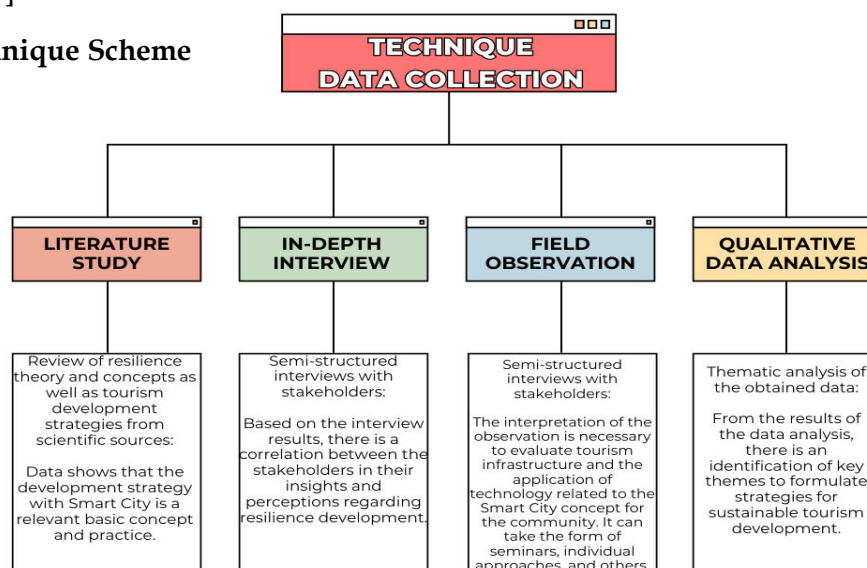
fluctuations. Thus, the development of Gili Mandangin as a tourist destination relies not only on its natural beauty but also on the readiness of the community and infrastructure to support sustainable and environmentally conscious tourism.

METHOD

This research uses a qualitative approach to formulate resilience development strategies based on tourism in Gili Mandangin. This research employs both primary and secondary data. The primary data in this study includes aspects used for calculating environmental carrying capacity, stakeholder analysis, and the travel cost method. Secondary data includes additional information sourced from books, journals, annual reports, literature, and other government documents[7]. The data produced can only be explained descriptively. Qualitative methods were chosen to gain an in-depth understanding of the conditions and challenges of sustainable tourism development on this island..

Qualitative Approach [7]

1. Data Collection Technique Scheme

refrence [7]

2. stakeholder table

stakeholder	Role	Information Obtained
Local Government	Decision-makers, planning	Policies and support
Tourism Industry Actors	Providers of tourism services	Challenges and needs
Local Community	Managers of destinations and local culture	Perception and participation
Smart City Expert	Technology and Innovation Consultant	Technology Recommendations

refrence [8]

3. Table of Initial Findings from Observation

Current Condition	Challenges Faced	
a. Tourism Infrastructure	Limited and needs improvement	Limited access and facilities
b. Interaction between the Community & Tourists	Positive, but requires management	Economic impact imbalance
c. Technology Implementation	Minimal, only small initiatives	Insufficient understanding and resources

refrence [8]

A. Tourism infrastructure

Improving the infrastructure in Gili Mandangin is very important to enhance its appeal as a comfortable and sustainable tourist destination. Infrastructure and access limitations need to be addressed[9]: **Accessibility:** Limited sea transportation makes it difficult for tourists to reach the island. The journey from Tanglok Harbor takes about 1 hour and 53 minutes with three boat schedules each day [9]. The addition of speed boat fleets is necessary to expedite access. The permanent dock built in 2008 helps the ships to berth, and than **Limited Facilities:** The number of accommodations, lodgings, and restaurants is minimal, and the healthcare facilities are inadequate for emergencies, and than **Electricity and Freshwater Management:** The water for bathing is slightly salty, and the freshwater distillation has been broken since 2017 [9]. Electricity is available 24 hours a day thanks to the diesel power plant that supports local economic development. And than **Environmental Conditions**: Poor waste management and open defecation habits affect the cleanliness of the island. Sustainable tourism practices are needed to protect the ecosystem. **Improvements Needed:** Increasing the frequency of sea transportation, repairing road infrastructure and public facilities, and enhancing the skills of the local community in tourism services.

B. Interaction between community & tourists

The interaction between the community and tourists on Gili Mandangin Island has positive potential, but it also requires good management to address the imbalances and economic impacts that may arise:

Positive Aspects: Cultural Exchange: Tourists learn about local culture, and the community introduces traditions. **Economic Income:** Tourists increase income from accommodation and food. **Need for Resource Management and Training:** Managing interactions to protect culture and the environment, and the community needs to be trained to improve services and sustainability. [3]

Therefore, the challenges faced are economic imbalance and economic impact. **Imbalance:** Local economic dependence is vulnerable to tourism fluctuations, and social gaps emerge between those involved in tourism and those not involved. **Economic Impact:** Price increases caused by the presence of tourists can lead to local inflation and the emergence of new business opportunities for the community. [3]

Positive interactions between the community and tourists in Gili Mandangin need to be managed well to address economic imbalances and impacts, for sustainable benefits.

C. Implementation of technology

The implementation of technology on Gili Mandangin Island, Madura, includes several small initiatives aimed at improving the quality of life for the community and supporting tourism development. Here are some key points[10]: **Hybrid Energy and Desalination:** The project led by Hery Purwanto aims to address electricity and clean water issues through the bulletin board "Wind of Change."[10] This initiative includes the construction of a pilot project for a hybrid energy generator (wind and solar) as well as desalination technology to produce fresh water. **Resource Limitations:** The lack of understanding and resources on this island hinders the implementation of more advanced technologies. and the community still relies on traditional methods and has not fully adopted modern technology. **Government Support:** The Sampang Regency Government acts as a facilitator in supporting research and innovation produced by the Madura State Polytechnic.This collaboration aims to enhance energy-efficient technology initiatives in the maritime sector.

4. Key Theme Table from Data Analysis

	Description	Implications for Strategy	
a.	Tourism Resilience	The ability of a destination to adapt	Focus on diversifying tourism experiences
b.	Smart City	Implementation of technology for management	Development of information systems and connectivity
c.	Local Community Involvement	Active role of the community in tourism	Training and community empowerment programs

refrence [11]

A. Tourism Resilience

To enhance the resilience of tourism on Gili Mandangin Island, diversifying tourism experiences has become the main strategy. This approach aims to attract a diverse range of tourists while reducing dependence on a single type of tourist activity. Some strategic steps

include: **Development of Nature Tourism:** Activities such as snorkeling, diving, trekking, and eco-tourism based on environmental preservation. **Cultural and Historical Tourism:** Tour packages showcasing local wisdom, traditional ceremonies, and the island's history.[6]

Adventure Tourism: Offering activities such as kayaking, paddleboarding, and camping/glamping, **Sustainable Accommodation:** Community-based homestays and eco-friendly facilities, **Digital Marketing and Collaboration:** Promotion through social media and collaboration with nearby destinations an than **Local Empowerment:** Community training in tourism management and involvement in decision-making. [6]

This diversification can expand the tourist market, increase local income, and create destinations that are more resilient to changing trends or crises.

B. Smart City

The development of information systems and connectivity on Gili Mandangin Island as part of the smart city concept involves the application of technology to improve the efficiency of resource management and public services. [2]

This includes the integration of information systems that support inter-agency communication, better data management, and improved connectivity for the community. Here are some important aspects of this development: **Information Technology Infrastructure;** Development of a fast and stable internet network to support information access and the use of sensors and IoT (Internet of Things) devices to collect real-time data on environmental conditions and infrastructure. **Data Management System;** Development of a platform that integrates data from various sources for better analysis and a transparent data management system accessible to the public to enhance accountability. **Connectivity and Mobility;** Provision of mobile applications that facilitate public access to services and important information, and the development of smart transportation systems that optimize routes and travel times. **Community Participation;** Encouraging community participation in decision-making through digital platforms and organizing training and outreach on the use of technology to increase awareness and community engagement an than **Sustainability and Resilience;** Integrating environmentally friendly technological solutions to support sustainability and Building systems that can adapt to climate change and natural disasters. [2]

By implementing these strategies, Gili Mandangin can become an example of an efficient, inclusive, and sustainable smart city, and improve the quality of life for its residents.

C. Local Community Involvement

Active Role of the Community: Involving the community in the planning and management of tourist destinations to ensure sustainability and cultural relevance. **Training Programs:** Providing training in tourism service skills and community-based management to enhance quality and competitiveness, **Economic Empowerment:** Encouraging the development of tourism SMEs and providing access to capital for local initiatives, **Strengthening Cultural Identity:** Exploring and promoting local traditions as tourist attractions through arts and cultural activities and than **Collaboration with Stakeholders:** Building partnerships with the government and private sector to support sustainable tourism development. [3]

With this approach, Gili Mandangin can develop tourism that is economically beneficial while preserving culture and the environment.

The approach of tourism resilience and smart city in the development of sustainable tourism is indicated to be complementary. Tourism resilience aims to strengthen travel adaptation to challenges with a focus on the continuity of the travel experience. This is evident from the data collection techniques that include in-depth interviews with stakeholders to understand their perceptions and constraints, as well as field observations that evaluate the physical conditions and interactions between the local community and tourists.

Meanwhile, the smart city approach involves the integration of technology to enhance the efficiency of destination management. This is reflected in the thematic analysis that identifies the need for the implementation of technology such as information systems and adequate connectivity. The participation of the local community becomes important, with their role as managers of culture and local attractions, which can be supported through training programs and innovative technology.

CONCLUSION

This research highlights the importance of implementing the Smart City concept and enhancing connectivity among stakeholders in efforts to build tourism resilience in Gili Mandangin. The analysis results show that by utilizing digital technology in destination management, Gili Mandangin can enhance the efficiency of public services, expand access to information, and optimize the management of tourism resources. This strategy is also capable of enhancing coordination between the local community, industry players, and the government, thereby creating a more resilient and sustainable tourism ecosystem. [7] The

implementation of the Smart City approach not only serves as a solution to address infrastructure limitations and environmental challenges but also as a strategic effort to enhance the competitiveness of Gili Mandangin as an innovative and adaptive tourist destination in the digital era. [2] Through strengthening connectivity, active participation from various stakeholders becomes key in facing the continuously evolving changes and challenges. Overall, this tourism-based resilience development strategy can make a significant contribution to the sustainability of tourism in Gili Mandangin, and serve as a model that can be applied to other tourist destinations facing similar challenges. [2]

THANK YOU NOTE

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