GeoJournal of Tourism and Geosites
ISSN 2065-1198, E-ISSN 2065-0817

Year XVI, vol. 46, no. 1, 2023, p.156-162
DOI 10.30892/gtg.46117-1011

PROSPECT AND CHALLENGES WITH PENTA HELIX MODEL FOR UNESCO GLOBAL GEOPARK AND LOCAL ECONOMIC DEVELOPMENT: A LESSON FROM INDONESIA

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Citation: Insani, N., Narmaditya, B.S., Habibi, M.M., A'Rachman, F.R., & Majid, Z. (2023). PROSPECT AND CHALLENGES WITH PENTA HELIX MODEL FOR UNESCO GLOBAL GEOPARK AND LOCAL ECONOMIC DEVELOPMENT: A LESSON FROM INDONESIA. *GeoJournal of Tourism and Geosites*, 46(1), 156–162. https://doi.org/10.30892/gtg.46117-1011

Abstract: Batur is the first area in Indonesia that is considered worthy of being a geopark by UNESCO. This determination is an acceleration of the progress of the nature and culture-based tourism industry that helps the welfare of the surrounding community with the principle of sustainability. This study aims to examine the role of several parties in enhancing UNESCO global geopark in Batur Bali of Indonesia as well as promoting local economic welfare. The study adopted a qualitative study with case study approach to gain a comprehensive result of the phenomenon. The qualitative content analysis and narrative analysis was used to process various information. This study focuses in UNESCO Global Geopark Batur Bali in Indonesia as the first and most successful in creating a better economic welfare primarily during and post the Covid-19 pandemic. The findings indicate that the Penta helix model can be used to develop Geopark Batur Bali and Indonesia in general in which each party plays their role in this development tourism and local economic development.

Key words: local economic development, geotourism, geosites, Penta helix model, community welfare

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INTRODUCTION

Indonesia has abundant resources in natural, cultural, and human resources that have the potential to promote economic development. However, poverty, household economic fragility, and sustainability have been an Indonesian challenge (Santika et al., 2021). The Indonesian government has responded to these issues by enlarging the tourism sector. Some scholars believe that the tourism sector can drive more job opportunities (Kakoudakis et al., 2017; Adie and Falk, 2021). Additionally, a recent study by Aquino et al. (2018); and Utomo et al. (2020) mentioned a robust correlation between tourism and local community development. The wealth of tourist destinations owned by Indonesia is indeed interesting to visit for local and international tourists. The development of the tourism sector sometimes sacrifices other components primarily related to conservation and sustainability issues (Moneva et al., 2020). Therefore, Geopark being the potential to both manage sustainability concerns and promoting economic wellbeing (Idris and Mansur, 2020; Wadhawan, 2021).

A geopark is a location with exceptional geological features, as well as archaeological, ecological, and cultural qualities, where locals are encouraged to take part in preserving and advancing the role of natural heritage (Ríos et al., 2020). Three components make up the geopark's major components are Geodiversity, Biodiversity, and Cultural-diversity (Catana and Brilha, 2020). The establishment of geopark has two primary purposes: conservation and community enhancement. The creation of the UNESCO Global Geopark (UGG) label at the end of 2015, as part of the UNESCO system, was the outcome of extensive talks between the NGOs Global Geopark Network (GGN), an epistemic group (International Union of Geological Sciences, IUGS) and United Nations Education Science and Culture Organization (UNESCO).

A bottom-up procedure involving all necessary local and regional partners creates geoparks, including local authorities such as community groups, tourism service providers, indigenous peoples, local organizations (Lukáč et al., 2021). Furthermore, Geoparks also need to empower local communities through cohesive partnership activities to promote important geological processes in the area such as features, periods, history related to geology, or extraordinary geological beauty (Dowling and Newsome, 2018). This process requires commitment from the local community, strong

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partnerships, political support, and a plan for showcasing and safeguarding the region's geological heritage that will satisfy all of the community's objectives. The creation of local economic competitiveness can be achieved by optimizing all potential economic resources, including natural, human, artificial, and social resources, to support development financing and local economic independence (Khambule, 2018). For this matter, regional policies are needed that can provide stimulants and encourage the exploration of regional economic potential into a solid form (Sukmawati and Maryanti, 2021). The region will optimize the abundance of resources (resources endowment) as the basis for driving the wheels of regional development. Local economic construction has a strong argument and rationality to be implemented (Rogerson and Rogerson, 2019) various countries that have emerged from adversity, local economic development in practice has succeeded in growing the performance of the national economy (Abrahams, 2018; Fiorentino, 2019; Khambule, 2018; Rogerson and Rogerson, 2019).

Indonesian Geopark is an area with a beautiful landscape that has an essential role in education with science value and comprises rare features (Ardiansyah et al., 2019). The main component of Geopark covers three elements, including geological heritage, biological diversity, and cultural expression. To present, Indonesia has six areas that include to Indonesian geopark: Toba Lake in North Sumatera, Merangin in Jambi, Batur in Bali, Rinjani in West Nusa Tenggara, and Ciletuh in West Java. Indonesia has great potential in developing Geoparks but Indonesia is still lagging behind in terms of numbers compared to other countries. Indonesia already has five UNESCO Global Geoparks/UGG 15 National Geoparks/GN which are being sought to become UNESCO Global Geoparks and approximately 110 locations that have the potential to be developed into Geoparks and the number continues to increase. A new geopark will be built when the area in question has a sustainable development plan for the people who live in it.

Since the important role of Geopark, whether for sustainability, geology, and economy, the study on this theme is on the rise. For Instance, (Cai et al., 2019) noted a correlation between sustainability issues and Geopark in Yimengshan. Another study by (Herrera et al., 2018) showed geotourism potential in the context of Geopark in Educator. However, there is a lack of study in the Indonesian context and its acquaintance with economic welfare. Most studies in the tourism sector are concerned with village-based tourism (Hawkins, 2022; UTOMO et al., 2020). A recent study by Ginting et al. (2017) concerned geotourism development in Toba Caldera Geopark by maximizing public facilities. In other side, large flow of tourism in Rinjani Lombok UGGp cause environmental damage (Hawkins et al., 2022).

Research by (Kastuti and Sulistyadi, 2021), joint management of the Ciletuh UGGp area is the key in achieving world-class tourism in a sustainable manner. Therefore, there is a need for a better understanding on how the role of global geotourism and local economic welfare. This study provides several contributions. First, this research provides a contribution and insight into the field of Geopark and geotourism by providing a collaboration model of Penta Helix as an enhancement model. The study in Indonesia is unique as it has a great potential for geotourism, but it has faced community economic vulnerability. Third, the successful enhancement model can be used to develop geotourism and Geopark in other areas in Indonesia and perhaps in other countries with indifferent geographical conditions.

MATERIALS AND METHODS

Methodology

The study adopted a descriptive qualitative study approach to gain a comprehensive result of the phenomenon. The main procedure uses purposeful sampling (to select cases that are considered essential), followed by a holistic analysis of the case through a detailed description of the patterns, context, and settings in which the case occurred. Qualitative data analysis that we use are qualitative content analysis and narrative analysis. Qualitative content analysis is used to analyze various kinds of secondary data, ranging from literature studies, maps, footage, to agency records. Narrative analysis is used to learn how research participants construct stories and narratives from their own points of view. This means that narrative analysis has a dual layer of interpretation. First, the research participants use narrative to interpret their own experiences. The researcher then interprets the narrative's construction. Journals, letters, conversations, autobiographies, transcripts of in-depth interviews, focus groups discussion, and other sources can all be used to create narratives analysis.

Data collection

In this research, the authors collect data from informants who come from elements of Penta Helix stakeholders, namely, Academics, Government, Business, Community, and Media. The author collects data from these five stakeholders (Figure 1). The feedback that the researchers want to know from these stakeholders is, first, how is their understanding and perception of the Batur Bali Geopark. Second, what roles and efforts have they made for Geotourism. Third, what are the supporting aspects and the obstacles they face in implementing tourism in the Batur Bali Geopark, and fourth, Cooperation in what fields have been carried out between stakeholders. Primary data and secondary data are the two types of data used in this study. Primary data is information that has come directly from a person, such as the findings of an interview done by a researcher, giving questionnaires, and direct observations. To see the map of geopark development, researchers

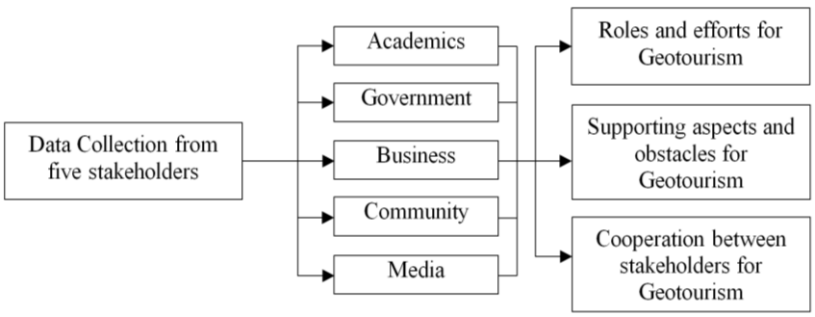
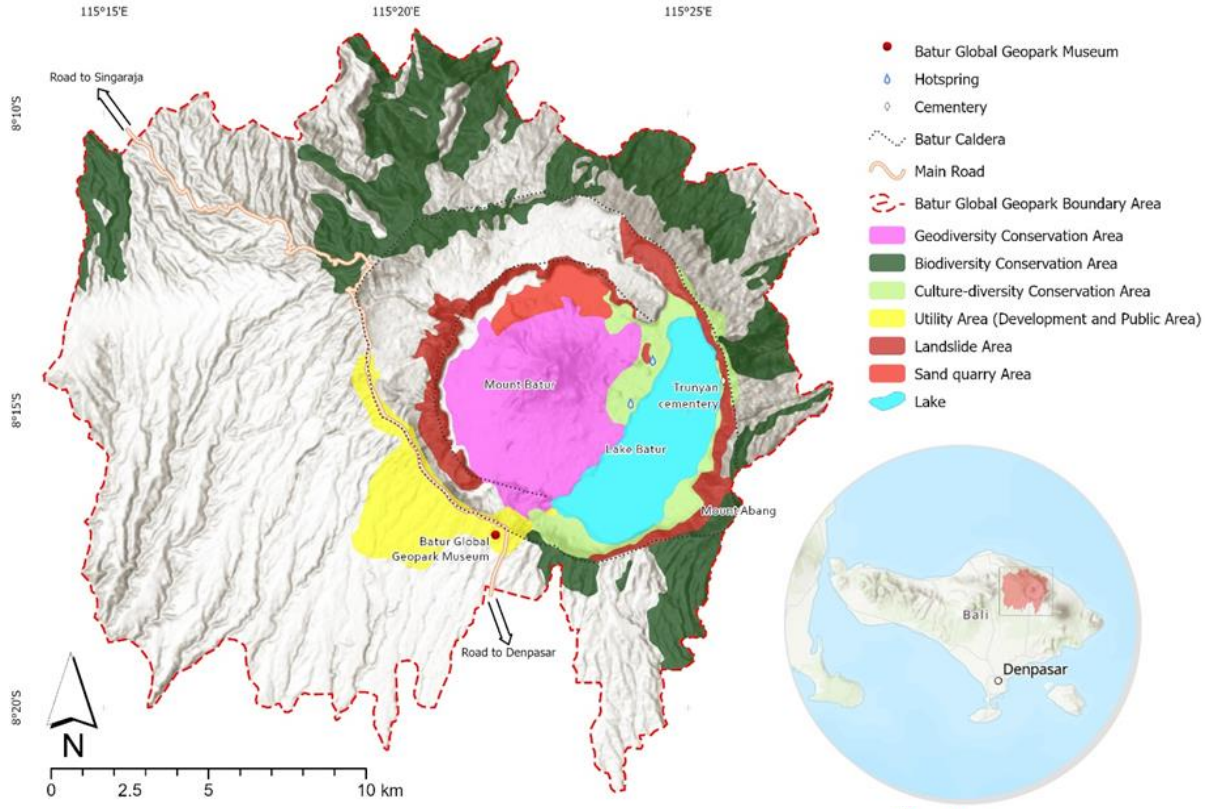


Figure 1. Data collection flow and analytics

made direct observations of the Batur geopark as a basis for understanding the potential and problems faced in geopark development. The interview in question is an in-depth interview with structured questions to understand the object of research.

Research sites and location

The research location in this study is conducted in Batur Geopark in Bali of Indonesia. The fundamental rationale is that Batur Bali in Indonesia is the first Geopark that Global Geopark Unesco in Indonesia has acknowledged. In figure 2, we can see the distribution of the area in the Batur Global Geopark which consists of various uses such as conservation areas (geodiversity, culture-diversity, and biodiversity), other utilization areas (utility area and sand quarry area), and hazard risk areas (landslide area). The geodiversity in Batur is unique because it is a strato mountain with two calderas and a freshwater lake. Moreover, the Batur volcano is still active and has several pyroclastic cones due to the past displacement of the eruption point. In addition, Batur has its uniqueness in cultural diversity, especially in Trunyan village, where access to get there can only be by walking or using a boat across the lake for 30 minutes. Trunyan Village is one of the Original Balinese Villages (Bali Aga), so-called because the residents there are Hindus and live side by side with nature on the slopes of the Batur Caldera. In terms of biodiversity, Batur is located in the tropics with an altitude above 1000 meters above sea level, making Batur has not only a beautiful landscape but also biological diversity. One of the most superior Batur biodiversity is the organic civet coffee and the Kintamani dog. Additionally, the community in the close research location has a unique culture and a robust social capital. Bali is also known as a tourism Island that has enormous potential and representative of Indonesia. Furthermore, Bali is a tourism destination, both local and international.



Geological Sites	Number	Geological Sites	Number
Crater 1	1	1888 Lava	10
Crater 2	2	1904 Lava	11
Crater 3	3	1905 Lava	12
Mount Abang	4	1921 Lava	13
Bukit Dalam Cinder Cones	5	1926 Lava	14
Bunbulan Cinder Cones	6	1963 Lava	15
Payang Cinder Cones	7	1968 Lava	16
Puraknya Cinder Cones	8	1974 Lava	17
Yehmampeh Cinder Cones	9	Batur Lake	18

Figure 2. Map of Batur UNESCO Global Geopark Area, and Geological sites location. This map is made from field observations and a review of supporting data from (Sutawidjadja et al., 2012) and (Rosyidie et al., 2018)

Data Analysis

This study followed the criteria from Miles and Huberman (1984). Data reduction, display data, and conclusion drawing/verification were used to collect qualitative data. The process of choosing, concentrating on simplification, abstracting from, and altering rough data that results from field notes on paper is known as data reduction. Even before data is collected, this procedure continues throughout the whole research project, as can be seen from the research framework, study issues, and the data collection approach adopted by the researcher. Reducing data undergoing a strict selection of data, summaries, or brief data descriptions and classifying them in a broader pattern.

RESULTS AND DISCUSSION

Strategic Issues in Batur Geopark

Geoparks with various kinds of potential have a very important role in the stability of the development of a region. Environmental factors are the main consideration in ensuring the balance of economic and social development of the community. In addition, Geopark also aims to develop the local economy, develop education, especially knowledge about geology, and protect the environment. However, several issues are generally faced in the development of geoparks, including the limited understanding of various parties about Geoparks. Accessibility to and within the Geopark area is still low. The low quantity and quality of tourism amenities (public infrastructure, public facilities, and services, tourism facilities). Management institutions that have not played an optimal role. There is no clear management system for almost all geosites (Figure 2). The lack of synergy between policies and programs for Geopark development. This is in agreement with some prior studies by (Aquino et al., 2018b; Sulistyadi et al., 2019), which mentioned those issues in managing Geopark.

A preliminary interview showed that the coordination that has been established is still person to person and has been institutionalized due to there being no leading sector regarding the concept of geopark development. Each agency tends to go its own way regarding the implementation of the geopark development plan. At this time, collaboration is an essential part of building mutual understanding and commitment and having a sense of responsibility in the continuity of regional development (Arintoko et al., 2020). Through attempts to incorporate the entire community, the inclusive development paradigm can promote the realization of forms of cooperation in the development process. Community economic development offers a role to build the strength of local communities through alternative economic activities so that the community has greater control over the process of social and economic activities in their area (Utomo et al., 2020).

The Perspective of Local Economic Development

Geopark management currently requires human resources who have the capability and acceptability of natural and cultural resources in the region. Therefore, community empowerment is needed, such as training in natural tourism management, tour guides, and entrepreneurship training to manage geopark areas and increase local community welfare. From the Geotourism perspective, there is a need for a comprehensive approach in ensuring sustainability, not only focusing on environmental conservation but also community empowerment and regional economic development. Consequently, a defined institutional framework is necessary to enable competent management. Professional management is the practice of managing budgets and revenue, facilities management, technical problem-solving, day-to-day management systems, and the coordination of stakeholders including local governments, academic institutions, corporations, entrepreneurs, and community organizations (Yasir et al., 2021). However, several things need to be considered in the management of Geotourism, including the necessity to strengthen the urgency of environmental conservation and its topographical wealth. The rapid development of Geotourism needs to prepare facilities according to the carrying capacity and capacity of the area. Ensuring sustainability through anticipating negative impacts with careful planning and strategy. Empowerment of local communities needs to be carried out continuously and intensively in supporting these tourism activities. Educational value and increase visitor/tourist satisfaction (Schmidt and Uriely, 2019).

Local economic development is a community-centered development model through various programs aimed at self-reliance (Rogerson and Rogerson, 2019). Communities are actors who determine goals, control resources, and direct the process of resource utilization (Manaf et al., 2018). The emphasis is on the community's authority to manage resources in realizing their interests. This activity is designed based on community initiatives and participation with an orientation to the local community's needs, potential, and capabilities, taking into account the variations and differences within the community (Gurău and Dana, 2018). Community Development is a program that seeks to reach people whose socio-economic conditions are still relatively low, and it is difficult to live a life that meets the eligibility and welfare requirements (Van Rooyen, 2014). The creation of local economic competitiveness can be achieved by optimizing all potential economic resources, including natural, human, artificial, and social resources, to support development financing and local economic independence (Khambule, 2018). For this matter, regional policies are needed to provide stimulants and encourage the exploration of regional economic potential into a solid form (Sukmawati and Maryanti, 2021).

The region will optimize the abundance of resources (resources endowment) as the basis for driving the wheels of regional development. Local economic construction has a strong argument and rationality to be implemented (Rogerson and Rogerson, 2019) various countries that have emerged from adversity, local economic development in practice has succeeded in growing the performance of the national economy (Abrahams, 2018; Fiorentino, 2019; Khambule, 2018; Rogerson and Rogerson, 2019). Natural resources, labor, capital, investment, entrepreneurship, transportation, communication, industrial composition, technology, size, export market, international economic situation, local government capability, federal and state government spending, and development assistance are all included in local economic development (Abrahams, 2018). However, the economic development practitioner is never particular which

factor has tremendous weight in any given situation. Furthermore, Barraket et al. (2019) stated that The hallmark of locally-based economic development is endogenous growth, which emphasizes the use of available human and natural resources to generate new job opportunities and jump-start local economic development activity.

According to Pike et al. (2015), Local economic development (LED) is a process that aims to establish development institutions in the area, improve human resources' ability to produce better products, and promote industry and business activities on a local level. Thus, regional development is viewed as an endeavor by the local community and regional government to create economic opportunities that are consistent with human resources and maximize the utilization of local institutions and natural resources (Saleh et al., 2020). Such is the strategic concept of local economic development (LED) in optimizing the potential of local resources built based on industrial clusters, which are expected to encourage further regional economic growth. From the community side, Local Economic Development is defined as an effort to free the community from all the limitations that hinder their efforts to develop welfare (Maolani, 2019).

Penta Helix Model for Tourism Development

The Penta Helix emphasizes the socio-ecological transitions that societies and economies require in the twenty-first century. Therefore, Penta Helix is ecologically sensitive. The natural environment of society and the economy should be understood within the Penta Helix innovation model framework as a driver for knowledge generation and innovation, hence outlining prospects for the knowledge economy (Putra, 2019). Penta Helix promotes the creation of a condition in which ecological, knowledge, and innovation coexist in harmony while fostering synergies between the economy, society, and democracy (Sumarto et al., 2020). Penta Helix is an innovation paradigm that focuses on social exchange and knowledge exchange inside a certain country or country subsystem, which can be used to address the current concerns of global warming (Yasir et al., 2021). Penta Helix combines knowledge and natural environmental systems into a framework that is interdisciplinary and transdisciplinary and may offer a step-by-step methodology for understanding effective development quality-based management, reestablishing harmony with nature, and letting future generations live a pluralistic and diverse existence on the planet (Chamidah et al., 2021; Yasir et al., 2021). In short, the Penta Helix provides a good theoretical and practical model is provided to society to help it understand the relationship between knowledge and innovation and to help it create sustainable development. The Pentahelix model is the first to introduce orchestration and ensures the quality of activities, facilities, and services as well as promoting experiences and benefits for community and environmental sustainability in tourism. As a result, it's crucial to promote the tourism industry by maximizing the contribution of business, government, community, academics, and the media (Figure 2).

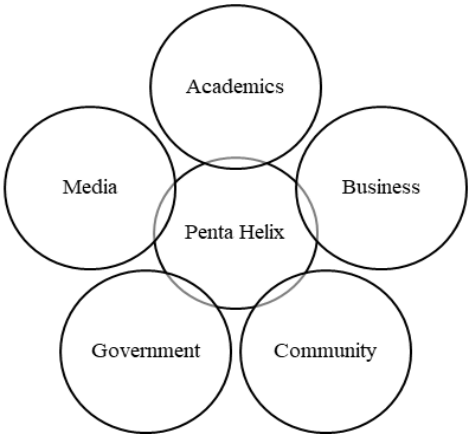


Figure 2. Penta helix Model for Geopark Development

Table 1. The collaboration model for Geotourism Development

Academics	Government	Business	Community	Media
1. Provide tourism directions, policies and regulation 2. Quality Tourism human resources 3. Analysis of tourism concepts, programs and strategies 4. Provider of tourism consulting services for the government, industry and the community. 5. Provide tourism human resources according to societal needs, industrial / business needs and professional needs	1. Designers, planners and guides, policies, strategies and regulations 2. Tourism zoning planner 3. Providers and developers of tourism infrastructure and access 4. Law enforcement, rules and regulations. 5. Creating a conducive climate for tourism business development.	1. Tourism service provider 2. Investors and implementers of tourism investment 3. Create markets, services, and jobs 4. Forming tourism communities and entrepreneurs 5. Enhance and development program	1. Tourism industry operator 2. Keepers of activity conducive tourism industry 3. Social controller in implementation of the tourism industry 4. Engage in planning, management and decision making and evaluation of tourism development 5. Explore and preserve tourism by developing local culture and the environment	1. Accelerate the delivery of tourism information 2. Covering and informing stakeholders 3. Educational facilities for the community 4. Channels for feedback and interaction between stakeholders 5. Providing tourism information and promotion

In this case, the development process can be carried out by the campus, where the campus brings together the other four pillars, namely the government as a tourism regulator and facilitator, tourism business companies, tourism industry associations, and the media. In this case, the campus uses information from business actors, industrial associations, and the government as study material and disseminates the results of the study to the other four pillars.

Meanwhile, the government formulates policies by taking into account the results of campus studies and feedback from the other three pillars. The same applies to business actors and industry associations, where they provide feedback to the government and provide information for campus research, as well as implement policies and study results.

Furthermore, mass media moves to all pillars in absorbing and disseminating information. Thus, it is hoped that the interests of stakeholders can be adequately met, and the tourism industry can move in a positive direction.

Based on the chart above, it can be seen that the types of relationships that exist between stakeholders in the Geopark Tourism development program vary. In accordance with the relationship and role that Academics, Community, Business, Academics as drafters have a coordinating relationship with business and community. This is due to the minimal sharing of resources with a moderate time commitment. In detail, the role of each party is provided in Table 1.

CONCLUSION

This study aims to examine the strategies issues existing in the development of Batur UNESCO Global Geopark in Indonesia and propose a Penta helix model for enhancing Geotourism and improving local economic welfare. The findings indicated that some issues are essential in the development, such as management, coordination, collaboration among parties. For example, the regulatory process that the government has set in its manufacture requires input from the five stakeholders. Once established, it needs to be coordinated effectively with the wider community, and business. Can directly and also use the role of the media. Furthermore, the implementation results in the field need to be followed up periodically by the five stakeholders to be redeveloped.

Therefore, the Penta helix model proposed can be used to develop the Geotourism that can be expected to drive community welfare. In the model, it can collaborate with many parties, including academics, business, government, community, and media. However, this study considers a limitation in one area's geographical location that can further be enlarged to other Geoparks in Indonesia and other countries to fully comprehend the phenomenon.

Acknowledgement

The Universitas Negeri Malang granted this project under the scheme of Indonesia Malaysia Research Consortium (IMRC) Social Humanities.

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Article history: Received: 03.10.2022 Revised: 02.12.2022 Accepted: 17.01.2023 Available online: 20.02.2023