

# Developing an educational tourism model for disaster-prone areas

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**Abstract.** The government has made an effort to develop tourism for disaster-prone areas to assist sustainable development, but due to the limited nature of disaster education, it has focused especially on doing so. The purpose of this study is to design the best educational tourism model for disaster-prone areas. The Tangkubanparahu Volcano disaster-prone areas served as the site of this qualitative study. While secondary data was gathered from literature, policy papers, and prior studies, primary data came from interviews and field observations. The study's findings indicate that the educational tourism model for disaster-prone areas is built on a framework that supports disaster literacy and involves the supply and demand of educational tourism. Because its scope is so closely tied to disaster-related features, geotourism is the perfect type of educational tourism for disaster-prone areas. For tourists and destination management, the contribution of educational tourism has the potential to mitigate the risk of disaster. Through disaster interpretation and tourist literacy, geotourism, can help disaster-prone areas realize sustainable tourism. Both nationally and internationally, this study may have repercussions for areas that are prone to disasters.

## 1 Introduction

Scholarly and popular media have long highlighted the connection between tourism and disaster education [1]. Tourism education during disaster-prone areas can be effectively achieved through disaster-educational tourism, as demonstrated by a number of earlier research [2]. Pre- and post-disaster education packaged by local communities through captivating tales catered to the tourism market niche can be the form of educational tourism in disaster-prone locations [3-5]. In addition, as it discusses the origins and effects of the disaster, post-disaster educational travel is also referred to as dark tourism [6-7]. After various disasters struck Indonesia, such as the Yogyakarta and Lombok earthquakes, the Aceh Tsunami, the Pangandaran earthquake, the Sunda Strait earthquake, and others, disaster educational tourism evolved. [8-11].

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Tourists' susceptibility to disasters are associated with tourism activities in the North Bandung area. Tourist attractions with higher disaster risk are more appealing, which contributes to an increase in both the quantity and activity of visitors [12-13]. The aim of educational tourism is to ensure that visitors, tourism management, and local residents know and practice the things that will help lower the risk of disaster in the North Bandung area. Identifying suitable tourism products is the first step in designing an educational tourism model for disaster-prone regions.

## **2 Methods**

The research's focus is on the earthquake- and disaster-prone Lembang Fault and Tangkubanparahu Volcano regions in North Bandung. Experts in geology, tourism, and disaster preparedness participated in semi-structured interviews and provided observational data for this qualitative study. Checklists for observations and interview instruments are used in data collection. The goal of primary data collection is to acquire an impartial, all-encompassing image of the educational tourism development model in the research area's disaster-prone locations. Using a desk study, secondary research data were gathered about educational tourism development models in disaster-prone areas and their implications for sustainable development. The data came from policy papers, literature, and prior research.

The information required is from an educational tourism offering system, specifically the educational tourism supplying side in disaster-prone areas, which is determined by combining the findings from element 6A, the tourism product system, and the classification of tourist attractions [1, 14, 15, 16]. Data on disaster risk reduction literacy and the function of educational tourism in disasters must be incorporated in order to build models of educational tourism in disaster-prone locations [17-19]. In order to support the establishment of educational tourism models in disaster-prone areas, this data was acquired as a reference for identifying acceptable educational tourism product.

Content analysis and qualitative descriptive analysis of data from observations, interviews, and examinations of literature, policy papers, and prior research are the methods of data analysis that were employed. After gathering the data and information, it is compared and tested against a range of accepted ideas and theories. It is then presented utilizing qualitative analysis techniques, such as data reduction, data presentation, data analysis prior to fieldwork, and conclusion. To prevent ambiguities, data is provided as images and tables with narrative descriptions to prevent different interpretations.

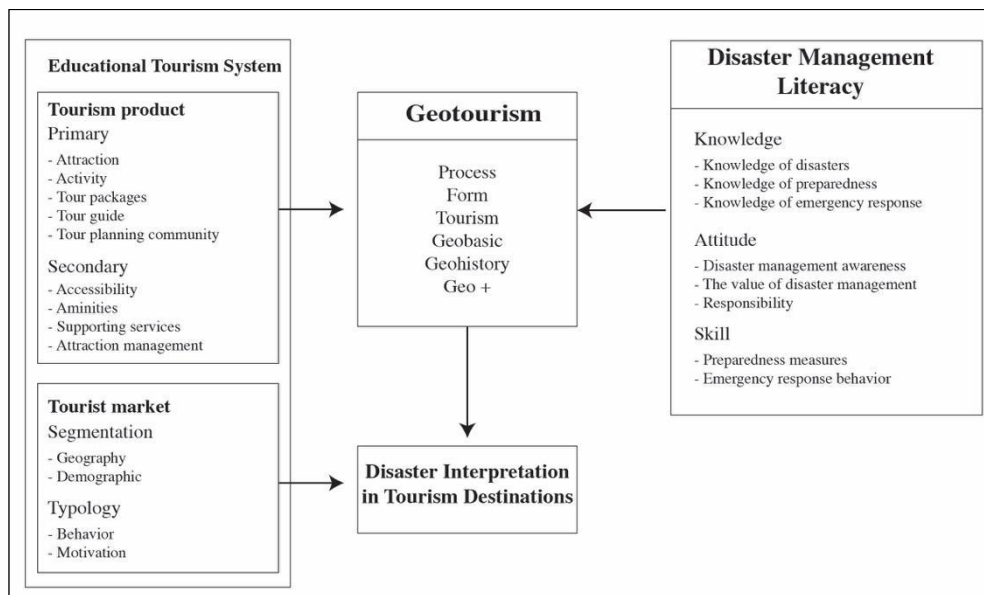
## **3 Results and discussion**

### **3.1 Model of Geotourism development as educational tourism in disaster-prone areas**

Due to the convergence of three tectonic plates, Indonesia's tourist spots are frequently found in disaster-prone areas. One of the most crucial things that tourism site managers can do to promote sustainable tourism is to educate visitors about disasters. In regions where disasters are common, geotourism, a type of instructional tourism, has the potential to grow into a profitable industry. The nature of geotourism, which is founded on aspects of geological phenomena, processes, and forms, indicates this. A paradigm for developing tourism in areas vulnerable to disasters is offered by the combination of geotourism, disaster literacy, and educational tourism.

Synthesising multiple multidisciplinary concepts and theories, the geotourism development model serves as educational tourism for tourist sites in disaster-prone locations.

This synthesis makes reference to the geotourism box concept, disaster management literacy, and the educational tourism system. The perspectives of the tourism supply, or products, and the tourism demand, or the tourist market, are included in the educational tourism system [1, 14, 20]. The development of geology-based tourism products revolves around the geotourism box, which encompasses indicators of process, form, tourism, basic geo, geo history, and geo + [15]. Moreover, knowledge, attitude, and competence indicators are used to determine disaster literacy [17-19].



**Fig. 1.** Model of Geotourism Development as Educational Tourism for Disaster Prone Tourism Destinations.

Figure 1 shows the model for promoting geotourism as educational travel to locations in disaster-prone areas. Disaster management literacy and educational tourism systems can be identified in order to complete this model's process. The outcomes of this identification serve as material for the growth of geotourism, enabling the interpretation of disasters in tourist areas in accordance with the previously established tourist market.

### 3.2 Educational tourism product in disaster-prone areas

An analysis of basic and secondary educational tourism product is provided in North Bandung's disaster-prone areas in order to help choose the best types of educational tourism for these types of locations. The North Bandung area's educational tourism products are formed by primary indicators of educational tourism products. These sub-indicators comprise tourist activities conducted at tourist destinations as well as attractions themselves.

Due to a location or object's attractiveness and uniqueness, tourism appeal serves as the primary reason for tourists to visit. The Tangkubanparahu volcano disaster-prone area and the Lembang Fault disaster-prone area are the study location's primary emphasis for tourist attractions. The two disaster-prone areas' tourism attraction inventory is divided into three categories: geological diversity, biodiversity, and cultural diversity. Two disaster-prone locations in North Bandung are home to a variety of tourist attractions, including biological, cultural, and geological ones. The Tankubanparahu Volcano is split into the Ci Mahi Area and the Tangkubanparahu Area inside the disaster-prone area. In the meantime, the Lembang

Fault is split into the Lembang Fault Area and the Ci Kapundung Area in earthquake-prone locations.

Out of the thirty tourist sites, sixteen have been classified as geologically diverse tourist attractions. The tourism destinations evaluated are those categorized as having a variety of geological features. Because geotourism is intimately tied to geological processes and shapes, which provide a tourist draw, it was selected as a type of instructional tourism in disaster-prone locations. Interpretation can be used to help tourists comprehend geotourism sites [21-24]. By enhancing visitor fulfillment, an interpretation that emphasizes geological features can help preserve geotourism destinations [25]. To qualify as geotourism attractions, tourist destinations in North Bandung's disaster-prone area must be reinterpreted [15-26]. The idea of reinterpreting geotourism pertains to the geotourism box, which encompasses the following concepts: process, form, tourism, geohistory, geobasic, and geo+.

By reinterpreting and analyzing geologically based tourist attractions, the attraction's classification as a geotourism attraction is changed. Tourist attractions with a biological and cultural focus are used to assist geotourism zoning, an attempt to facilitate the integration of geotourism attractions. The geotourism area is centered on two disaster-prone regions in the North Bandung Region: the Lembang Fault Earthquake Disaster-Prone Area and the Tangkubanparahu Volcano Disaster-Prone Area. As a result, areas in the North Bandung area have been designated as disaster-prone areas. Each disaster-prone area has a geotourism attraction that is supported by biological and cultural-based tourist attractions. This offers a variety of geotourism activities along with interpretations related to geological phenomena. Table 1 shows the geotourism zoning in the North Bandung area that adjusts to the circumstances of disaster-prone locations.

**Table 1.** Geotourism area in the disaster-prone area of North Bandung.

Disaster-prone areas	Geotourism Attraction	Supporting Tourist Attractions	
		Biodiversity	Cultural
Tangkubanparahu Volcano	1. Cimahi Waterfall 2. Tilu Leuwi Opat 3. Asepun Waterfall 4. Bubrug Waterfall 5. Putri Waterfall 6. Layung Waterfall 7. Mount Tangkubanparahu natural tourist park	1. Layung Pine Forest 2. Kunti Forest 3. Jayagiri Forest	1. Observatorium Bosscha 2. Cikahuripan Dutch Fort 3. Junghuhn Nature Reserve 4. Jayagiri Dutch Fort
Lembang Fault earthquake	1. Dago Waterfall 2. Mount Batu Lembang 3. Lalay Waterfall 4. Kidang Waterfall 5. Batu Batik 6. Koleang Waterfall 7. Omas Waterfall 8. Maribaya Waterfall 9. Tebing Keraton	1. Mount Palasari	1. Dutch Fort Tugu Secapa Lembang 2. Dago Bengkok Hydroelectric power 3. Japanese cave 4. Dutch Cave 5. Lembang Fault Viewing Tower 6. Kabuyutan Batu Loceng site

Designing geotourism routes that have the potential to be packaged as disaster-based educational tourism packages is aided by the geotourism region in North Bandung, which is prone to natural disasters. The Lembang Fault Earthquake Education Tour Package and the

Mount Tangkubanparahu Disaster Education Tour Package are the available educational tour packages.

Land-based activities account for the majority of the variety of activities offered to tourists at the research area. In general, adventure tourism activities including cross-country running, hiking, and river swimming are offered at the study area. Activities along the Cimahi River are categorized as river treks, which include hiking and investigating the river's course. The tourism destinations along the Cimahi River—Curug Cimahi, Curug Tilu Leuwi Opat, Curug Aseupan, Curug Bubrug, Curug Putri, and Curug Layung—are used to illustrate the analysis's findings. Hiking to several craters in the Mount Tangkubanparahu area is a common pastime that allows one to engage in sightseeing activities. In the meantime, visitors can enjoy thrilling pursuits in the Cikahuripan region, like trail running and hiking at the Cikahuripan Dutch Fort.



**Fig. 2.** Tourist activities in the Tangkubanparahu Volcano Disaster Prone Area, Hiking and Sightseeing in Tangkubanparahu (a) and Trekking and Cross-country Running in Cikahuripan and Tangkubanparahu (b).

Trekking is a popular form of tourism in the earthquake-prone Lembang Fault region, both on the Lembang Fault line and in the Djuanda Forest Park area. Because of the numerous waterfalls in the Djuanda Forest Park area, including Curug Lalay, Curug Kidang, Batu Batik, Curug Koleang, Curug Omas, and Curug Maribaya, it can be classified as a rivertrek activity along the Cikapundung River. Lembang Fault route exploration and sightseeing at Tebing Keraton are two other tourism activities that can be done in locations vulnerable to the Lembang Fault earthquake.

## 4 Conclusion

Integrating ideas and theories with physical attributes and the direction of tourism and disaster management policies results in the creation of an educational tourism model for disaster-prone places. As an instructional tourism offering, geotourism contributes by providing tourists with an understanding of geological formations and processes as a source of natural phenomena. Synthesizing the field results with the designated theories and concepts comes next, following the identification of the educational tourism product and the features of the North Bandung disaster-prone area. In order to grow tourism in tourist attractions situated in disaster-prone areas, the synthesis produces a geotourism model. Educational tourism in disaster-prone areas has the potential to be utilized as a reference. Moreover, this model may have effects on tourist locations at the regional, national, and international levels.

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