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DESIGN OF DISASTER MITIGATION INFOGRAPHIC FOR ECOTOURISM IN KALITALANG, BALERANTE VILLAGE

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Abstract

Indonesia is a country with high ecotourism potential, supported by its natural wealth and cultural diversity. However, its geographical location in the *Pacific Ring of Fire* makes it highly vulnerable to geological disasters, particularly volcanic activity. This phenomenon demands the integration of tourism development with adaptive and sustainable *disaster mitigation* efforts. One area that represents a model of mitigation-based ecotourism is Kali Talang, located on the slopes of Mount Merapi, Klaten Regency. Despite being in a disaster-prone zone, this area continues to function as a tourist destination as well as an educational space that provides understanding of volcanic hazards and risk reduction efforts. This work aims to convey information about volcanic disaster mitigation through a visual approach based on infographics, as an effective medium of public communication. By raising issues of risk and preparedness within the context of managing natural tourism areas, this work is expected to strengthen collective awareness and encourage the development of more resilient and sustainability-oriented tourism practices.

Keywords: Infographic, Disaster Mitigation, Volcano, Ecotourism, Kali Talang

INTRODUCTION

The development of the tourism sector in Indonesia has experienced rapid growth and is not a new phenomenon. The increasing number of tourist destinations and the rise in investment in the tourism sector have made this industry one of the key sources of regional income. The tourism sector holds great potential for driving economic growth, creating jobs for local communities, and accelerating the development of promising tourist destinations across various regions (Chaniago, 2024). The range of tourist attractions offered is very diverse, from *religious tourism*, *cultural tourism*, and *culinary tourism* to *nature-based tourism*, which is now more commonly known as "*ecotourism*" (Musadad et al., 2020). Indonesia possesses extraordinary natural wealth, from towering mountains to beautiful sandy beaches, making every corner of the country a strong candidate for development into a top tourist destination. According to Deputy Minister of Tourism and Creative Economy Angela Tanoesoedibjo, Indonesia's abundant natural and cultural resources can serve as a key asset in the development of *ecotourism* (Hendriyani, 2022). Utilizing this tourism potential not only plays a role in attracting both local and international tourists, but also in promoting economic

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growth and supporting *environmental conservation*. This is reinforced by data from the Ministry of Tourism of the Republic of Indonesia, which shows a significant increase in foreign exchange earnings from the tourism sector. Therefore, the vast economic potential of this sector must continue to be developed as a driver of regional and national development (Suwika & Kasih, 2020).

Figure 1. Grafik Devisa Sektor Pariwisata
Source: Kementerian Pariwisata, 2025

Nature-based tourism specifically contributes significantly to national revenue while also empowering human and natural resources in local areas (Saepudin et al., 2017). In addition, tourist visits have a positive impact on increasing the income of local communities through accommodations, restaurants, and other supporting services. The core principle of *ecotourism*, which emphasizes active community participation in tourism planning and management (Ridlwan et al., 2017), demonstrates that this sector plays an important role in supporting both local and national economies, including through taxes and levies that contribute to state revenue.

Despite the significant potential of the *nature-based tourism* sector, there are critical challenges that must be addressed—particularly regarding the location of tourist destinations in *disaster-prone areas* such as volcanic slopes. Indonesia's position within the *Pacific Ring of Fire* (Hammada & Sampean, 2024), faces high *geological risks* due to its significant number of *active volcanoes*. According to data from the Ministry of Energy and Mineral Resources (ESDM), there are 127 *active volcanoes* across Indonesia (Adri et al., 202), each capable of triggering *natural hazards* such as *eruptions*, *volcanic tremors*, and *pyroclastic* or *cold lahar flows*. Furthermore, the National Disaster Management Agency (BNPB) reported that as of January 2025, three volcanoes were placed under *emergency alert status*, one of which was Mount Merapi.

Figure 2. Infographic of Volcanic Activity
Source: Times Indonesia , 2025

The development of ecotourism in mountainous areas must be accompanied by the implementation of comprehensive *disaster mitigation strategies*. Necessary actions include the establishment of *early warning systems*, evacuation training for local communities and tourists, and the construction of *adequate emergency response infrastructure*. These *mitigation efforts* are crucial to ensure that tourism activities not only support *economic sustainability* and *environmental conservation*, but also guarantee the safety of all parties involved, including managers, local communities, and tourists.

Infographics, or *information graphics*, are a form of visual data presentation that has rapidly developed in the field of *mass media* and *public communication* (Isla & Hunowu, 2022). This progress cannot be separated from the role of graphic designers who are able to integrate factual data with modern *design software technology*. Through a *visual approach*, *infographics* can convey complex messages in a concise, engaging, and easy to understand manner. Their ability to summarize complicated information, which might feel tedious if delivered only in text or incomplete if presented only through *static images* makes *infographics* a highly effective medium. As a result, *infographics* are now widely used in various forms of communication, such as *presentations*, *annual reports*, *scientific articles*, *blogs*, and public *education tools*. The advantage of *infographics* lies in their *efficiency* in delivering information *quickly*, *clearly*, and in a *targeted manner*.

Based on the various data presented, the author contends that *infographics* serve as an ideal medium for conveying information related to *volcanic disaster mitigation*, particularly

within the context of managing *ecotourism areas* located in *disaster prone regions*. This *infographic work* is designed as an *educational* and *visual tool* to enhance public awareness of *disaster risks* and to outline *mitigation measures* that can be undertaken by both local residents and tourists in the area.

The tourism sector remains a key area of investment for increasing national foreign exchange earnings. Indonesia possesses distinct advantages in terms of its natural landscapes, cultural diversity, historical heritage, and social richness assets that hold strong potential for ongoing development. In recent years, *nature-based tourism*, such as *mountain hiking*, has gained growing popularity among the public (Lutfiyana et al., 2025). The public's tendency to visit *natural destinations* is related to the need for relaxation and mental refreshment from the routines of urban life. In fact, many tourists are willing to travel long distances just to experience tourism that offers peace and a close connection with nature. Besides providing *psychological benefits* to visitors, *nature tourism* also has a positive effect on *local economic growth* in tourist areas. Therefore, many *natural destinations* are now labeling themselves as *ecotourism* spots—types of travel aimed at enjoying and learning about *nature*, *local culture*, and *history*, while also contributing to *environmental conservation* and the *empowerment of local communities* (Purwanto et al., 2020).

A concrete example of the implementation of this concept is the Kali Talang ecotourism site, located in Balerante Village, Kemalang District, Klaten Regency. Positioned on the slopes of Mount Merapi and directly adjacent to Mount Merapi National Park, this destination offers breathtaking volcanic landscapes while being situated within *Disaster-Prone Area III*. Despite its location, the site remains safe for visitation, as it lies approximately four kilometers from the summit of Mount Merapi, allowing tourists to enjoy unobstructed views of the volcano without compromising safety. The site has been actively managed since February 27, 2017, and currently provides a variety of tourism experiences, including *camping grounds*, *trekking trails*, and *volcanic observation activities*. These experiences are offered in the form of *guided tour packages*, allowing visitors to witness the sunrise over the *volcanic landscape* firsthand.

The *ecotourism concept* implemented in Kali Talang serves not only as a *recreational destination* but also as a *community-based conservation area*. The site adopts an approach that harmonizes the *preservation of natural resources* with the *socio-economic empowerment* of the surrounding community. In line with Fandelli's perspective as cited in Purwanto et al. (2020), the successful management of *conservation areas* requires integration between *biodiversity* and *ecosystem preservation* and the *active participation* of local people. Kali Talang is also considered to meet the *ecotourism criteria* described by Dagri in Muhammad & Widarjono (2023), which include: (1) s*ustainable environmental conservation*, (2) *delivering positive economic impacts for the local population*, and (3) *avoiding negative social consequences*. These attributes position Kali Talang as a concrete example of an *ecotourism destination* that not only offers a meaningful *travel experience* but also supports *disaster mitigation efforts* and strengthens *local involvement* in maintaining *ecological balance*.

IMPLEMENTATION METHOD

The *methodology* for developing this *infographic project* comprises three main stages: *pre-production*, *production*, and *post-production*. These stages are systematically structured to support the effective and communicative *visual delivery of information*. The *pre-production phase* involves the *collection*, *selection*, and *analysis of data* relevant to the infographic's theme namely, *volcanic disaster mitigation* within the context of ecotourism *development*. The analyzed data is then formulated into a coherent *visual narrative structure*, accompanied by the planning of key *design elements* such as *layout*, *illustrations*, *color schemes*, *iconography*, and *typography*. This stage is intended to establish a *logical* and *accessible flow of information* that aligns with the visual character of the *infographic* and reinforces its *educational purpose*.

The next stage is *production*, which involves the implementation of the design concept into a *visual format* using *Adobe Illustrator* software. This tool was selected due to its capability to produce *high-quality vector illustrations* and its flexibility in handling *complex graphic elements*. During this process, various *visual components*—including *diagrams*, *symbols*, *illustrations*, and *text compositions*—are proportionally integrated to ensure that the infographic is both visually appealing and effective in conveying information.

The final stage, *post-production*, involves the final refinement of the completed *infographic*. This process includes checking for *visual consistency*, *readability*, and the *accuracy of the information* presented. The purpose of this stage is to ensure that the *infographic* is ready to be used as a functional information medium that can effectively convey its message particularly in the context of education on *disaster mitigation* and *sustainable ecotourism* practices.

RESULTS AND DISCUSSION

Following the *design phase* of the *infographic*, the next step focuses on a *comprehensive analysis* of the *visual effectiveness* and *communicative strength* of the message conveyed through the *design elements*. This analysis is conducted through three main approaches. First, the technical aspect, which involves evaluating the quality of graphic composition, readability of visual elements, and the organization of informational structure to ensure that the infographic is accessible and easily understood by the audience. Second, the aesthetic aspect, which examines the use of *color*, *typography*, *iconography*, *illustration*, and *overall layout* to assess how effectively the *infographic* captures attention, facilitates understanding, and creates a cohesive *visual impression*. Third, the message aspect, which centers on the accuracy and clarity of the information conveyed, as well as how successfully the *infographic* represents the issue of *volcanic disaster mitigation* in an educational and communicative manner. Through this analysis, the *infographic* is expected to function not only as an *engaging visual medium* but also as an effective and educational tool for *information dissemination*.

Figure 3. Final Design of Volcanic Disaster Mitigation Infographic
Source: Author's Documentation

From a technical point of view, this *infographic* was created digitally using *Adobe Illustrator*, with a *canvas* size of 21 x 36 cm. No *traditional techniques* were used in the process, so all *visual elements* were fully developed through a digital approach. *Adobe Illustrator* was used to arrange the main *illustration layout*, *organize supporting elements*, and build the overall *visual composition*. The design process began with making a *rough sketch* as the foundation, then continued with *layout* arrangement until the final form was achieved.

From an aesthetic *perspective*, the *infographic* employs a *warm-toned color palette*, featuring dominant combinations of green, yellow, orange, and red, with additional accents of blue to enhance the overall *visual appeal*. Dark gray is used to represent the form of the volcano, while orange *symbolically illustrates* the flow of hot lava. All *textual elements* are *rendered* in black to ensure optimal readability and to maintain visual clarity for the audience.

From the perspective of messaging, the *infographic* is visually designed to deliver a warning and guidance regarding the mitigation of active *volcanic disasters*. This is conveyed through the central illustration of a volcano emitting plumes of smoke, serving as the primary

visual element. Below the illustration, essential information on *mitigation* measures is presented, accompanied by supporting icons to facilitate audience understanding of the message. This visual approach is intended to communicate the information effectively while also maintaining *aesthetic* appeal.

CONCLUSION

Indonesia has great potential in developing *nature-based tourism*, especially *ecotourism*, which not only offers recreational experiences but also supports *environmental conservation* and the *empowerment of local communities*. However, Indonesia's geographic location along the *Pacific Ring of Fire* makes it vulnerable to geological disasters such as *volcanic eruptions*. Therefore, managing tourist areas in *disaster-prone regions* requires a well-planned and *sustainable mitigation* approach. The Kali Talang *ecotourism* area on the slopes of Mount Merapi is a clear example of the integration between tourism potential and *disaster mitigation strategies*, emphasizing visitor safety and community involvement in area management. As an effort to support the effective dissemination of *disaster mitigation* information, the *infographic* was developed as a *visual communication* medium capable of delivering complex information in a concise, engaging, and easily understandable manner.

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