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To cite this article: N Ginting *et al* 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **452** 012156

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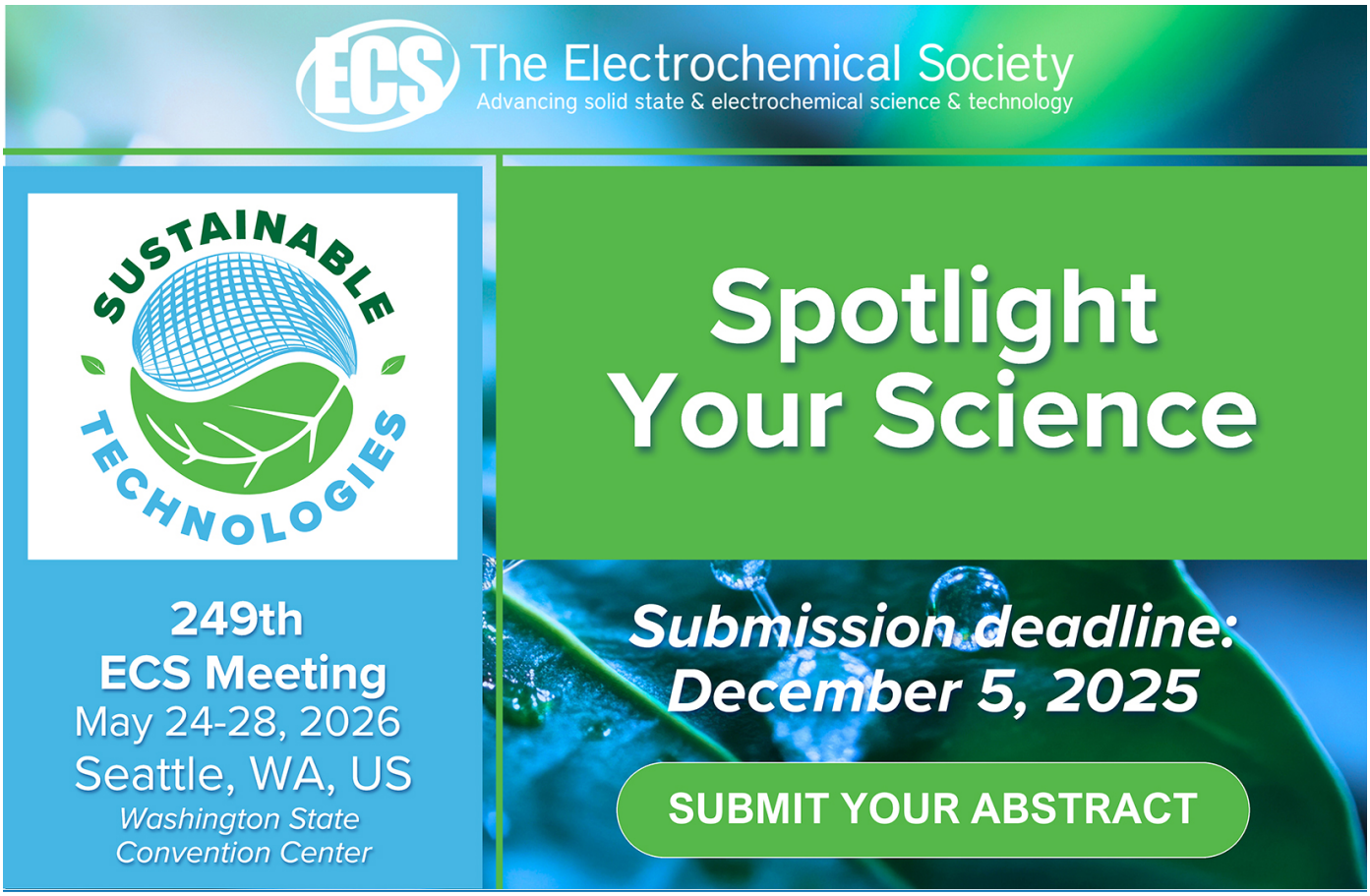

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Geotourism and stakeholders: An approach to enhance geoconservation

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Abstract. Tourism is a strategic sector in escalating the economy and improving the life quality of the community. This industry provides advantages in economic and social fields, which is essential in developing a region. In the Lake Toba Geopark of Indonesia, geotourism applies as a development strategy to increase visitors as well as to conserve the environment. Located at two separated geoareas of the geopark, Tongging and Bakkara have substantial prospects to enhance geotourism, given the wealth of natural and cultural elements in both destinations. Conservation is one of the geotourism aspects that maintain environmental sustainability while simultaneously fosters benefits for tourists and local communities. The purpose of this study is to explore the roles of conservation in geotourism through stakeholders approach. It focuses on youth visitors in Tongging and the local community in Bakkara. By using a qualitative method, observations and interviews were conducted in the two locations. The study finds that environmental and cultural conservation contributes to the enhancement of geotourism in Tongging and Bakkara.

1. Introduction

Tourism grows by the rise of income and quality of life in the global society, in which traveling has become a basic need [1]. The tourism industry can bring many social and economic benefits, especially in developing countries where one of its primary motivations is the expected economic improvement and regional development [2]. Promoting a destination with a concept that matches with its identity and characteristic is important to achieve the maximum benefit from tourism. It is due to the strong impact of place identity that indicates uniqueness, notably in nature-based tourism, distinguishing a place from others [3].

Geotourism is on the rise worldwide [4]. To develop recreational activities and induce economic effects, geosites may become tourism resources because of their scenic, scientific, cultural, and economic interests [5]. These interests are the primary attraction in geotourism [6][7][8]. In Sumatra, Indonesia, the Toba Caldera was formed by a geological phenomenon [9][10], creating a uniqueness that is very potential to be developed into a geopark, as it geological heritage give birth to a harmonious

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community living with nature and local wisdom [11]. Two rural villages representing those exciting features are settled at two geosites in the area, namely Tongging and Bakkara.

In rural areas with the unique geological landscape, geotourism is a way for implementing sustainable principals and geoconservation methods [12]. Conservation aspect is crucial in geotourism [13], and in the perspective of sustainable development, all geoheritage values must be used proportionately to maintain their level of interest so that their current and future conservation can be guaranteed [5]. As a tourism development concept, geotourism utilizes geodiversity where the people are involved in managing and conserving environmental sustainability [13][14][15]. Accordingly, geoconservation is highly dependent on its stakeholders. In this study, the referred stakeholders are youth travelers who intensively support the promotion of the relatively new concept of geotourism [16] as well as the local community who strongly influence the success of its implementation [14], aiming at exploring the roles of conservation through stakeholders' participation in geotourism.

2. Literature Review

2.1. Geotourism Stakeholders

Geological heritage offers numerous tourist attractions, natural resources, and landscapes to visitors [12]. Such attractions combine nature, science, and tourism activities through geotourism. As a tourism development strategy, geotourism fosters natural richness, in which geodiversity plays the leading role in educating about nature and providing pleasant experiences for visitors [13][14]; it promotes conservation of geoheritage, appreciation of geosites, and interpretation of geoscience [8][14][17]. Geotourism is also described as a form of natural area tourism that focuses on geology and landscape, endorsing visits to geosites, conservation of geodiversity, and an understanding of earth sciences through appreciation and learning [18]. Central to geotourism development is the inclusion of a range of stakeholders [19]. However, due to a lack of recognition on the interests and vulnerability of geodiversity, it is necessary that all the stakeholders involved in geotourism be aware of the emerging issues [5]. In this context, conservation is the concern because of its importance and relevance to geosites, geoheritage, and geodiversity as the core object of geotourism.

Geotourism is a new niche in tourism that needs vast promotions. The promotions of tourism products and services are encouraged by the strong presence of young people in social media [16]. However, though young travelers tend to look for new experiences [20], they are the fastest-growing group of travelers with low environmental awareness [21][22]. Geoconservation involves various parties, including geotourist [23]. Therefore, youth travelers have a unique position among the stakeholders in geotourism. On the other hand, for community-based tourism development, perception of the community is an important factor [24]. Identifying their opinion is required because environmental and social aspects are entangled [25]. Moreover, one of the critical factors for sustainable conservation in geoparks is the level of awareness of stakeholders, particularly local communities [26]. They play an important role because no one knows the territory better than them [27].

2.2. Geoconservation

The goal of geotourism is to foster tourism development opportunities while ensuring the conservation of geoheritage attributes [28]. Finding, introducing, and establishing geosites is the initial step to conserve geological heritage [27]. Various strategies for geoconservation efforts, including educational programs in geoscience [27][29], establishment of geoparks [27][30], sustainable management [19][30][31], and infrastructure improvement [31].

Similar to the other forms of sustainable tourism, geotourism is emphasized on conservation and economic benefits for the local community [14][28]. Among the sustainability factors in geotourism are environmental and cultural conservation [32]. While cultural attraction is highly appreciated by youth travelers [33], excessive environmental exposure for tourism purposes leads to damage [34]. As a solution, conservation on both environmental and cultural elements in a youth geotourism destination is

needed to ensure its sustainability. Moreover, by conserving both the environment and the culture, the locals could gain opportunities to improve their economy [35].

Geotourism can be described according to key principles that are similar to other sustainable forms of tourism; one of its characteristics is fostering local community benefits [14]. Geotourism sustainability includes environmental conservation, cultural protection, and community economic improvement [33]. Another significant conservation aspect in geotourism is geosite protection [11][18][36]. The addressed geosites are those that have scientific and historical values [37], enabling visitors' interpretation of the objects. In community-based tourism, the community actively involves and participates in its management [38][39]. Eventually, they will become confident and empowered, leading to a positive impact on their life quality [38]. Geoconservation introduces and empowers the community in the actions taken for geosite protection. In the process, the workforce comes from the community and their knowledge of the territory [27]. It is also no less important to note that as a strategy for economic development, as well as a means for geoconservation, a geopark is a managed territory founded on an exceptional geological heritage that could be used to improve the living conditions of its inhabitants in a sustainable manner [40].

3. Method

3.1. Method

The study purpose is to explore the roles of geoconservation in stakeholder's perspective. It should be based on the observation and perception of the studied objects. Therefore, a qualitative method is used. This method is appropriate in providing broad knowledge from many perspectives regarding the wide tourism phenomena [37]. The research materials were retrieved from reviewing literature, performing field observations, and conducting interviews. The survey was held in May and June 2019 for a total of six days in both locations. At that time, researchers observed, documented, and wrote notes based on the research variables. Information about conservation efforts was collected from four respondents in Tongging and Bakkara. They are tourism practitioners from both the public and private sectors. Similar researches on geotourism development in Indonesia have also adapted this method [8][11][31]. The data received were then interpreted and analyzed with the most recent and relevant theories to be concluded by the end of this study.

Table 1. Research Variables and Indicators.

Location	Variables	Indicators
Tongging: Youth Geotourism	Environmental conservation	- Energy, water, and waste management - The intensity of environmental occupancy - Pollution caused by tourism activities
Bakkara: Community-based Geotourism	Cultural conservation	- Impacts from tourism toward local culture - Cultural protection procedure

3.2 Study Site

The Toba Caldera is the world's biggest quarterly caldera formed by a supervolcano eruption 74.000 years ago [43]. At present, the remaining pieces of evidence from that phenomenon are the geological, biological, and cultural diversities [11], spread out at seven geopolitical areas, including Tongging and Bakkara. In Tongging area, observations were held at six locations that are frequently visited by youth travelers, namely (a) Sipisopiso Waterfall, (b) Sipisopiso Mountain, (c) Gajah Bobok Hill, (d) Sapo Juma, (e) Jabu Ertuah Park, and (f) Tongging Village. In the Bakkara area, the identified geosites are (g) Aek Sitiotio Springs, (h) Parik ni Huta Sarcophagus, (i) Sisingamangaraja Temple, (j) Janji Waterfall, and (k) Hariara Tungkot Tree.

4. Results and Discussions

4.1. Environmental Conservation

4.1.1 Energy, Water, and Waste Management

Despite being a geologically based tourism, the purpose of geotourism is similar to other forms of tourism in terms of environmental conservation and community empowerment [14]. In Tongging, six locations where youth spend their travels were observed. Among them, (d) Sapo Juma manages its energy and water consumption efficiently, implementing a fixed electricity hour (7–10 am and 5–11 pm) for daily operations.

"We are strict in narrowing energy consumption because of its scarcity in this area. We also have a designated water system with an expert working on it so that we can guarantee the availability of freshwater without interrupting the lake ecosystem." (Key respondent: Site Manager of Sapo Juma)

Figure 1. The environmental situation at the study sites in Tongging.

Two locations, respectively (d) Sapo Juma and (e) Jabu Ertuah Park, are owned by private sectors, making it more organized and representative for tourism activities. Although explicitly visible, both are potential to promote biodiversity conservation for their abundant amount of flowers planted and grown on the sites, adding to the employment of the locals to carry out gardening, providing economic benefits for the local community through conservation efforts [14][28].

Figure 2. Biodiversity conservation at (d) Sapo Juma and (e) Jabu Ertuah Park.

Meanwhile, in Bakkara, the community is involved in the geoconservation efforts. The researchers observed that the community plays an active role in conservation initiatives, such as (1) community participation for no littering program and (2) tree-planting activities. The unusual position of Bakkara in a steep valley facing up to the caldera makes it a landslides prone area. This situation leads to awareness among community members on the importance of sustainability. Their actions include (1) taking care of the hygiene of (g) Sitiotio Springs as a source for natural freshwater with drinking quality, (2) preserving numerous ancient trees around the area, and (3) repainting (i) Sisingamangaraja Temple

as a means of heritage preservation. These initiatives indicate that environmental conservation through community participation [18][27] is happening, affirmed by the interview below.
"Conservation activities in Bakkara have been going for quite some time, involving local communities. We are committed to keep the cleanliness in tourism sites and avoid careless littering." (Key respondent: Local Tourism Agency)

However, no location in Tongging is identified to have a decent waste management system. It is unfortunate because environmental conservation is among the key elements in geotourism [32]. It is also observed that natural sites, such as (b) Sipisopiso Mountain and (c) Gajah Bobok Hill, have no transparent management system, resulting in the inadequacy of sanitation. Though located at an exceptional geological heritage, in terms of geoconservation, a sustainably-managed area [40] have not been achieved. Contradictory, in Bakkara, most of the sites are managed by the cooperation between the local tourism government and the local community. For example, the (j) Janji Waterfall management is in the responsibility of the Banjarnahor clan from the community, and the (i) Sisingamangaraja Temple is managed by the descendants from the king's clan. The locations observed in Bakkara is cleaner than those in Tongging. The synergy among the stakeholders involved creates a better managerial system for a geotourism destination. As a result, the involvement of the local community in managing a geotourism destination is essential from the environmental protection perspective.

Figure 3. (j) Janji Waterfall and (i) Sisingamangaraja Temple in Bakkara.

4.1.2 Intensity of Environmental Occupancy

The occupancy of youth travelers in Tongging at the six locations observed is varied, depending on the day of the week. Weekends are typically crowded, while weekdays are relatively quiet. Researchers found that among all locations, youth travelers movements were intense at (b) Sipisopiso Mountain and (c) Gajah Bobok Hill, dominated by hiking and camping activities. Sightseeing was present at (a) Sipisopiso Waterfall and (d) Sapo Juma, while in (e) Jabu Ertuah Park and (f) Tongging Village, youth travelers did taking selfies. It is on the researchers' note that youth travelers are comparatively considerate to the environmental intensity during their visit to the tourism locations, supporting the theory that they are the group of travelers who tend to look for new experiences [20].

Figure 4. Campsites situation at (b) Sipisopiso Mountain and (c) Gajah Bobok Hill.

Figure 5. Youth travellers at (a) Sipisopiso Waterfall, (b) Sipisopiso Mountain, and (c) Gajah Bobok Hill.

Figure 6. Youth travellers at (d) Sapo Juma, (e) Jabu Ertuah Park, and (f) Tongging Village.

Meanwhile, in Bakkara, (i) Sisingamangaraja Temple is the most crowded site among the others. Due to the long historical background of the sacred places in Bakkara, visitors remain considerate by taking off their shoes and not making noises as an act of respect during their visit. Therefore, in the perspective of environmental occupancy, both youth and geotourism and community-based geotourism perform similar good practices, as long as the visitors aware that the sites are sacred and need to be treated respectfully.

4.1.3 Pollution

Youth travelers are identified as having low environmental awareness [20][21]. It is evident by the abundant amount of garbage, specifically in the locations with unclear management authority. The observation shows that camping activity leaves a great deal of plastic waste in both locations. On the other hand, privately-owned sites such as (d) Sapo Juma and (e) Jabu Ertuah Park, as well as bathing places in (f) Tongging Village are cleaner than others, due to a clearer management system. However, although the other locations have no stated ownership, the concept of community participation in managing the destination [38][39] could be implemented to achieve geoconservation purposes [37] and sustainable management [40].

“Young people visiting this place usually leave plastics. I think this is the only drawback of youth activities in this area.” (Key respondent: Business Owner at Sipisopiso)

Figure 7. Left garbage and solid waste at (a) Sipisopiso Waterfall and (b) Sipisopiso Mountain.

At two natural attractions in Bakkara, namely (j) Janji Waterfall and (k) Hariara Tungkot Tree, interpretative panels are present. Garbage bins, changing rooms, and lightings are available as well. However, for tourism intensification, these facilities need to be styled and tidied up to make the sites more presentable.

4.2 Cultural Conservation

4.2.1 Impacts on Local Culture

Youth travelers enjoy finding and gaining new experiences throughout their journey; they see the culture of the community in the destination as an attractiveness [44]. On our collective perception, it is challenging to invite youth travelers in environmental or cultural conservation efforts. Instead, youth travelers are those who are willing to participate in conservation if only they are given the correct instruction to do so [21]. Based on observation and interviews, youth travelers in the study area of Tongging have no cultural friction with the locals. Meanwhile, in Bakkara, the community is eager to welcome visitors as several new homestays are established.

Figure 8. Homestay in Bakkara Village.

4.2.2 Cultural Protection Procedure

Cultural assets are typically sensitive and need to be treated with considerable care. Therefore, it is important to keep a balance between cultural protection and tourism activities [45]. Among the observed locations, the (a) Sipisopiso Waterfall has an open stage facility, performing traditional shows every Sunday. This facility is a good initiative in protecting cultural assets. The regular performers are local youths, encouraging community participation in the tourism activities [15] while at the same time adding to travelers' appreciation on cultural diversity.

In addition to that, Bakkara's local government is consistent in digging their cultural richness to be developed as tourism products. The community actively participates in providing information about unnoticeable cultural sites. For example, the existence of the ancient sarcophagus, known as (h) Parik ni Huta in the local language, was informed by the local community. Furthermore, though recognized as a cultural site managed by the local government, the repainting activities at (i) Sisingamangaraja Temple is exceptional because it can only be carried out by those coming from the locals who remain in the family-line of the afore-mentioned king. These observation results support the theory that the local community is the most compliance party to work on geoconservation because of their knowledge about the territory [27].

Figure 9. Sarcophagus geosite in Bakkara.

"The sarcophagus in Bakkara is called 'parik'; it means a fortress. The area of Tippang in Bakkara is a megalithic village, according to Sir Ketut from the Archeological Center who researched on history some time ago. Tippang was an ancient settlement. Bakkara is the heritage of Toba's civilization." (Key respondent: Local Tourism Agency)
"Cultural preservation programs are carried out by the government. We visited each household in this village, promoting tourism awareness and offering rewards for those who have information about hidden geosites in this area." (Key respondent: Local Tourism Agency)

In the perspective of cultural conservation, both youth geotourism and community-based geotourism show positive efforts in conserving the local culture. The difference lays in the actor of the conservation itself, as the local community plays a more significant role than the youth travelers since youth travelers are the consumer of the cultural conservation activities. Thus, cultural conservation adds to their understanding of the cultural diversities of the sites they visit.

5. Conclusions

The explained literature, observations, and interviews found that the youth travelers in Tongging and the local community in Bakkara are the stakeholders for geotourism development in each location. From the stakeholders' perspective, environmental conservation and cultural conservation contribute to the enhancement of geotourism in Tongging and Bakkara. Moreover, geotourism sustainability has a strong correlation with the involvement of the local community, where they could gain opportunities and increase their welfare from conservation activities. Therefore, community-based geotourism shows more prominent impacts on geoconservation. In addition to that, tourism should bring economic benefits; otherwise, it would not be sustainable. With that being said, the efforts made by the stakeholders are supporting geoconservation efforts in the study locations. The more conservation efforts made, the more benefits obtained by the people.

As a recommendation, to achieve a successful geoconservation program, a reliable management system is needed in each location, to ensure that the destination is managed and organized sustainably. The involvement of the local community is crucial in this context because they are the active player as well as the receiver of the benefits provided by tourism activities in the area. Besides, it is suggested to strengthen environmental protection in Tongging by creating initiatives to raise youth awareness in environmental sustainability.

Acknowledgment

Authors sincerely express gratitude as this research is funded by DRPM Kemristekdikti RI 2019.

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