Geotourism in west bandung regency to promote citatah-saguling aspiring geopark

S R P Wulung¹*, Y Adriani², B Brahmantyo³, A Rosyidie⁴

¹Faculty of Social Studies Education, Universitas Pendidikan Indonesia, Bandung, Indonesia.
²Centre for Tourism Planning and Development, Institut Teknologi Bandung, Bandung, Indonesia
³Faculty of Earth Sciences and Mineral Technology, Institut Teknologi Bandung, Bandung, Indonesia
⁴Department of Regional and Urban Planning, Institut Teknologi Bandung, Bandung, Indonesia
* wulung@upi.edu

Abstract. Citatah-Saguling is part of the Bandung Basin region, which has geodiversity as a tourist attraction. Biodiversity and cultural diversity in the Citatah-Saguling area are related to geodiversity processes and forms that can support the development of geotourism in the Citatah-Saguling area. This study introduces geotourism development to promote aspiring geopark. Using cases in Citatah and Saguling Region, West Bandung Regency, this study identifies tourist attractions based on geodiversity, biodiversity, dan cultural diversity aspects. Furthermore, mapping and grouping of geotourism in the Citatah-Saguling area are based on integrates physical conditions with local government policies, destination systems, and transportation networks. The approach used is based on primary and secondary data. Data analysis method using qualitative analysis, content analysis, and map analysis, and equipped with a qualitative descriptive analysis method. The study found that the spatial model in Citatah-Saguling geotourism development is divided into two tourism areas with Karst Citatah and Ancient Citarum themes. The distribution of tourist attractions in Citatah-Saguling includes 19 geodiversity-based, 2 biodiversity-based, and 9 based on cultural diversity. This paper ends with a destination mapping and practical implications of the findings.

1. Introduction
The Citatah-Saguling region is part of the administration of West Bandung Regency and Greater Bandung Metropolitan. Referring to the policy of the West Java provincial government, Citatah-Saguling tourism development is part of the Bandung Basin Strategic Tourism Region with the theme of developing nature-based education tourism. Furthermore, the West Bandung regency government through the West Bandung Regency Tourism Development Master Plan (Ripparkab) policy made geotourism is the theme and direction of tourism development in Citatah-Saguling. The theme of tourism development through geotourism in Citatah-Saguling refers to the geological history of the Bandung Basin. Based on the geological process, the formation of the Bandung Basin began in the Eocene era (56 million-25 million years ago) through the presence of the river and delta deposits in the Citatah area (Bayah Formation) [1]. Initially, the Bandung Basin was a shallow sea and a place of coral life, now it has been raised to the surface so that the formation of limestone hills in the Citatah Area [2–4], known as the Citatah Karst area [5,6]. Another geological phenomenon in the Bandung
Basin area is the formation of a prehistoric lake. The process of capping the Citarum River by Mount Sunda eruption material around 55,000 years ago triggered the formation of the Ancient Bandung Lake [7–9], which eventually collapsed in the Cukangrahong area (western part of the lake) and Jompong Waterfall (eastern part of the lake) [2,10]. The collapse of Ancient Lake Bandung in Cukangrahong resulted in the ebb and flow of lake water resulting in changes in land use [11]. Currently, land use in the area is used as a Saguling reservoir surrounded by settlements and activities in the fishing, agriculture, and tourism industries [4,12–14].

There is evidence of cultural diversity in the Citatah-Saguling area, one of which is the first human in the Bandung Basin area found in Goa Pawon, Citatah Karst Region. The existence of Goa Pawon, about 55,000 years ago, became a place of residence and shelter for prehistoric humans. This is supported by anthropological findings such as hunting tools, pottery, and human fossils [15]. Also, fragments of vertebrates’ bone and shells of freshwater mollusks were found, indicating that there was biodiversity around the Citatah Karst. Furthermore, the land conditions of the area are very fertile, thus supporting human survival to come and settle [16].

Some recent studies, especially related to tourism, show that in the Citatah-Saguling area, human resources are shifting from the mining industry to tend to support conservation ideas through tourism in the Citatah mining area [17], development of environmental carrying capacity in the Mount Masigit tourist attraction through the concept of a geopark [18], geotourism reinterpretation on nature-based tourist attractions in the Bandung Basin area [19], Citatah Karst potential as a geotourism attraction [5], and community-based tourism development as a strategy for alleviating poverty in the communities around the Saguling Reservoir [20].

The phenomenon of the process and form of geodiversity and supported by biodiversity and cultural diversity is the main capital in sustainable development through the development of geotourism and realizing an area as an Aspiring Geopark. Geotourism is a manifestation of tourism in natural areas that focuses on geological and landscape aspects [21], and biodiversity and cultural diversity aspects [22]. The geotourism attraction must be supported by management, interpretation, facilities, and infrastructure for meeting tourist needs [23,24], it aims to promote geological features and encourage conservation activities, understanding earth science through appreciation and learning. Geotourism development can be realized through aspiring geopark and its one tool to develop an area through geotourism [25]. The main tools for the geodiversity and geotourism development can be fostered through the Global Geopark Network [26]. Geopark is an innovative concept in an integrated geographical area and has a significant geological landscape for conservation, education activities, and socio-economic sustainable development [27,28]. Geopark also inspires cultural pride, engages local communities, and preserves environmental and cultural assets [29,30]. There are three levels of geopark [31], the first was the Aspiring Geopark as an initial attempt to build a geopark. The second stage is National Geopark and joins a fellow national geopark network. The final stage is joining the global geopark network through the UNESCO Global Geopark.

Recent research suggests that Aspiring Geopark can help protect natural heritage, local culture for regional development based on geotourism potential in Rio Coco, Nicaragua [32–34]; protect the heritage of paleontological and archaeological and improve the quality of life of local communities through geotourism in Yemen [35]; creating sustainable values regarding science, tourism, and education in Figueira da Foz, Portugal [36]; help promote mutual knowledge and peace between communities and as a sustainable development strategy in The Majella National Park, Italy [37]; and as a tool for sustainable socio-economic development through geotrail planning in Doukkala-Abda, Morocco [38].

This study aims to identify tourist attractions based on geodiversity classification, biodiversity, and cultural diversity so that the opportunity can be assessed as an attraction for geotourism in supporting the development of the Citatah-Saguling area as an Aspiring Geopark. Also, mapping and grouping of geotourism were carried out in the Citatah-Saguling area.

2. Methods
This study uses a qualitative research approach with descriptive qualitative research methods that aim to obtain actual data about social phenomena and identify and evaluate problems. Secondary data used literature studies on previous research and local government policies, while primary data was obtained through field observation and semi-structured interviews with tourism attraction managers in the Citatah-Saguling area. Field observation aims to obtain data and information about conditions of tourist attraction in terms of geodiversity, biodiversity, and cultural diversity.

An assessment of tourist attraction refers to six variable units of the geotourism box concept (Figure 1). Geotourism box includes component: 1) process, observable geological and geomorphological activities; 2) form, present landscapes, the face of the earth, and rock outcrops; 3) tourism, a supporting component for the realization of geotourism activities which include indicators of attractions, accessibility, amenities, activities, and planning and management; 4) geobasic, basic knowledge of earth science which has an important role in understanding geological forms and processes; 5) geohistory, the story of an event related to figures especially geologists who have studied a region; and dan 6) geo +, the relationship between geological sites to the history, social, and culture of the local community.

![Figure 1. Geotourism box concept and its main components, adaptation from (a) and (b) [39]](image)

There are four fundamental variables in designing a map of the Citatah-Saguling Aspiring Geopark area, covering indicators: 1) regional characteristics, including accessibility availability, distance and travel time, and route conditions between tourist attractions; 2) functional and normative, integration between policies and field conditions related to spatial use; 3) explanatory and predictive, explaining the actual field conditions and can predict future market development of tourists; and 4) integration between spatial elements, including tourist origin areas, tourism destinations, tourist service centers, tourism areas, circulation routes, tourist attractions, and tourist entrances [40–42]. The analytical method used in this study includes qualitative, descriptive, and map analysis through a series of processes which include the process of input, management, plotting, and data conversion.

3. Results and Discussion
The coverage of the Aspiring study area Geopark Citatah-Saguling is located in three sub-districts in West Bandung Regency, including Cipatat, Padalarang, and Saguling. The area was once the edge of Ancient Lake Bandung which is rich in geodiversity and is the main resource for tourism activities in Citatah-Saguling. At present, the area is used for conservation areas and community economic development through the tourism sector. Citatah area is one of the protected areas that makes tourism as one of its uses and has a policy by the local government of West Bandung Regency and West Java Province. Meanwhile, the Saguling area through Indonesia Power and Perhutani supported by the local community has made tourism as one of the sectors to increase the economic level of the region through the development of tourist attractions.

Tourist attractions in Citatah-Saguling are identified into three classifications based on geodiversity, biodiversity, and cultural diversity. The tourist attraction classification aims to support the development of the Citatah-Saguling region as an aspiring geopark through geotourism development. There are 19 geological-based tourist attractions scattered in the study area supported by biodiversity and cultural diversity classification (Table 1).

3.1. Geotourism Attraction in Citatah-Saguling

Geodiversity is the main aspect of identifying the geotourism attraction supported by biodiversity and cultural diversity in the development of geotourism in the Aspiring Geopark Citatah-Saguling. These three aspects are identified based on the geotourism box, which includes process elements, form, tourism, geobasic, geohistory, and geo +. The explanation of geotourism box elements in each tourist attraction in Citatah-Saguling is explained in the following sub-section.

3.1.1. Process. Geodiversity at Citatah-Saguling begins with the process of lifting shallow seas to the collapse of Ancient Lake Bandung. The elevation of the shallow sea surface, until now it has become a limestone hill (Citatah Karst), beginning with a tectonic process that causes limestone to undergo several reactions known as the karstification process. The geological process began 56 million-25 million years ago in the Bayah Formation, now forming a limestone hill known as the Citatah Karst region [1–6]. Limestone in the Citatah Hills is one of the natural proofs of the natural karstification process known as the Rajamandala Formation. Geodiversity based on the process can be found in Area Pasir Pawon tourist attraction (Pawon Cave, Stone Garden), Mount Masigit, Mount Hawu, Mount Manik (Cliffs 48), Mount Pabeasan (Cliffs 90), Mount Singgalang (Cliffs 125), and Sanghyang Poek Cave. Besides, there is also Lake Ciburuy which has a unique limestone and has an island in the middle.

The process of geodiversity formation in Citatah-Saguling is also influenced by the history of quarter volcanic development from Mount Sunda to Mount Tangkubanparahu and includes the collapse of Ancient Lake Bandung. The stemming of the Citarum River by the eruption of the Sunda Mountain in 55,000 years ago triggered the formation of the Ancient Lake Bandung [7,8]. Briefly, the formation of Ancient Lake Bandung originated from the eruption of Mount Sunda and the curving of the Citarum River in the Bandung Basin. The process of breaking down Ancient Lake Bandung in the western wall (Kiara-Larang Hills Area) and producing a new segment of Citarum River in the form of a narrow valley (Cukangrahong area) currently produces geodiversity which is used as a tourist attraction which includes Halimun Waterfall, Hawu Waterfall, Pangulaan Waterfall, Cikahuripan Waterfall, Sanghyang Heuleut, Sanghyang Poek Cave, Sanghyang Kenit Cave, and Sanghyang Tikoro. Besides that, there is a phenomenon of crack expression near the Saguling Hydroelectric Power Plant which emits surface hot water which is currently used as a tourist attraction, namely Saguling Hot Spring.
Table 1. Classification of tourist attractions on Citatah-Saguling

| Classification | Tourism Attraction               | Code | Location                      | Owner/ Manager                        |
|----------------|----------------------------------|------|-------------------------------|---------------------------------------|
| Geodiversity   | Pawon Cave                        | A1   | Gunungmasigit, Cipatat        | West Bandung                          |
|                | Stone Garden                      | A2   | Cipatat                       | Regency Government                   |
|                | Mount Masigit                     | A3   | & Pokdarwis Pasir              | Pawon                                 |
|                | Cliffs 48                         | A4   |                               |                                       |
|                | Cliffs 90                         | A5   | Citatah, Cipatat               | West Bandung                          |
|                | Cliffs 125                        | A6   | Padalarang                    | Regency Government                   |
|                | Mount Hawu                        | A7   |                               |                                       |
|                | Ciburuy Lake                      | A8   |                               |                                       |
|                | Sanghyang Kenit Cave              | A9   | Ciburuy, Padalarang           |                                       |
|                | Sanghyang Tikoro                  | A10  | Rajamandala Kulon, Cipatat    | Indonesia Power                       |
|                | Sanghyang Poek Cave               | A11  | Cipatat                       | Qurotu A’Yun                          |
|                | Bedil Waterfall                   | A12  |                               |                                       |
|                | Saguling Hot Spring               | A13  |                               |                                       |
|                | Sanghyang Heuleut                 | A14  |                               | Perhutani & LMDH                      |
|                | Kiara-Laran Hills                 | A15  |                               | Qurotu A’Yun                          |
|                | Halimun Waterfall                 | A16  |                               |                                       |
|                | Hawu Waterfall                    | A17  | Saguling                      |                                       |
|                | Pangulaan Waterfall               | A18  |                               |                                       |
|                | Cikahuripan Waterfall             | A19  |                               |                                       |
| Biodiversity   | Wana Mandalala Cengkrong          | B1   | Rajamandala Kulon, Cipatat    | Perhutani                             |
|                | Kebun Buah Alam Seger             | B2   | Ciptaharja, Cipatat           | PT. Purnawangi Majujaya               |
| Cultural       | Prehistoric human fossils         | C1   | Gunungmasigit, Cipatat        | West Bandung                          |
| Diversity      | Pawon Cave Cultural Village       | C2   | Cipatat                       | Regency Government & Pokdarwis Pasir  |
|                | Pawon Cave Museum                 | C3   |                               | Pawon                                 |
|                | Indiana Camp                      | C4   |                               |                                       |
|                | Pawon Hill Ancestral Stone        | C5   |                               |                                       |
|                | Pawon Hill Site                   | C6   |                               |                                       |
|                | Rahengan Ceremony                 | C7   |                               |                                       |
|                | Saguling Dam                      | C8   | Saguling                      | Indonesia Power                      |
|                | DCC Monument                      | C9   |                               |                                       |

3.1.2. Form. The karstification process developed and eventually formed the morphology of karst hills along Citatah-Saguling such as Pawon Hill (Stone Garden), Mount Masigit, Mount Manik, Mount Pabeasan, and Mount Singgalang. Besides, the karstification process forms morphology in the form of caves such as Pawon Cave, Mount Hawu, Sanghyang Kenit Cave, and Sanghyang Poek Cave. The Morphology of Mount Hawu is unique to the cave forming a ring (natural bridge) (Figure 2). While the process of breaking down Ancient Lake Bandung, in Kiara-Laran Hill, forming a waterfall (Halimun Waterfall, Hawu Waterfall, Pangulaan Waterfall, and Cikahuripan Waterfall) and a narrow valley where the Citarum River flows. The Citarum River is used as a tourist attraction such as Sanghyang Heuleut and Sanghyang Tikoro.
3.1.3. Tourism. The tourism element has a role in identifying tourist linkages and geotourism attractiveness. This element includes five fundamental indicators in assessing the opportunity for geodiversity to become a geotourism attraction. The first indicator is an attraction, the indicator is related to the classification that is nature-based tourist attraction (geodiversity and biodiversity) and man-made based (cultural diversity). This indicator further outlines the attractions and events (both natural and man-made) found in tourist attractions. Natural attractions in Citatah-Saguling cover the overall tourist attraction in the geodiversity classification, namely in the form of mountains, hills, karst, cave, waterfall, and lake. There are no natural events that are attractions in Citatah-Saguling, examples of natural events or phenomena that are attractions such as seeing the small eruption on Gunung Anak Krakatau and the Lapindo Mud phenomenon. While artificial attractions such as Saguling Dam, Pawon Cave Museum, Wana Mandala Cengkron, Kebun Buah Alam Segar, and Traditional Village and prehistoric human fossils in Goa Pawon are designed to attract tourists. Except Saguling reservoir does not aim to bring in tourists, but it becomes an attraction that can bring tourists. Meanwhile, for the artificial event at Citatah-Saguling there is a Rahengan traditional ceremony.

Accessibility, as the second indicator, towards Citatah-Saguling can only be done by land and can be taken using public transportation (bus, shuttle, taxi, online transportation) or private modes. The mode of transportation uses airplanes that land in the city of Bandung, Majalengka Regency, and Jakarta. The distance from the east (Bandung) ranges from 30 minutes and 2 hours from Majalengka, while from the west (Jakarta) to Citatah-Saguling it ranges from 4 hours. The third indicator is amenities, the main facility in supporting geotourism activities in Citatah-Saguling which includes 1) service facilities for tourists such as banking services, tourist information centers, communication networks, guides, interpretations, and tourism services; 2) accommodation in the Saguling area; 3) food and beverages services, found in every tourist attraction in Citatah-Saguling; and 4) public services such as health services (health center in each sub-district), worship facilities in every tourist attraction, and gas stations available at Citatah and Padalarang.

The fourth indicator is activities that tourists can do while in a tourist destination or attraction. There are several activities that tourists can do while in the Citatah-Saguling area, these activities are classified based on land, water, and air activities. In Citatah-Saguling there are land and water-based activities, land activities such as geotrek/ trekking, hiking, rock climbing, and cycling. Three mountains in the Citatah Karst region have become the main destination for tourists, especially rock climbers. Each mountain has different heights, so it is known as Cliffs 48 (Mount Manik), Cliffs 90 (Mount Pabeasan), and Cliffs 125 (Mount Singgalang). Geotrek or geotrail has become a new phenomenon, especially in Indonesia, in exploring, appreciating, and studying geodiversity. There are several communities including matabumi and geotrek.id which routinely conduct geotrek activities, in the Bandung Basin region the favorite geotrek destinations are in the Karst Citatah and Citarum Purba.
areas on Saguling. Water activities that can be done include swimming in Sangule, Heuleut and Cukangrahong Area, boating in Situ Ciburuy, bathing in hot water at Saguling Hot Spring, and Arum in the area of the Saguling Hydroelectric Power Plant (Sanghyang Kenit and Sanghyang Poek).

Planning and management are the last indicators in the element of tourism. This indicator identifies the role of stakeholders in providing all facilities for meeting tourist needs and preserving nature and culture as tourism resources. Planning and management can be in the form of tourist route design/geotrek, visitor management strategies, tourism-related regulations/policies. Stakeholders related to the development of geotourism in Citatah-Saguling include the Government (Central Government, West Java Province, and West Bandung Regency), State-owned enterprises (Indonesia Power and Perhutani), local communities (Pokdarwis and LMDH Qurotu A’Yun), and Private Sector (PT. Purnawangi Majujaya).

3.1.4. Geobasic. Basic knowledge of earth science plays an important role in understanding the processes and forms of geodiversity. Such knowledge can be in the form of geology, geography, meteorology, hydrology, and so on. Also, science that has relevance to the processes and forms of geodiversity needs to be understood. Such basic scientific understanding can be communicated through active interpretations (interpreters or tour guides) and passive interpretations (guidebooks, brochures, social media, and other indirect media). Pawon Cave and Stone Garden are tourist attractions that have active interpretation facilities through scouting by the local community. While other tourist attractions that do not have active interpretation facilities, tourists can get basic knowledge through passive interpretation, namely through guide books to find information on the internet.

3.1.5. Geohistory. Previous studies on a region conducted by a geologist related to geological events became an important element in understanding geotourism. At Citatah-Saguling there are several geologists who have recorded and reviewed each geological event, including Stehn and Koenigswald have examined the existence of Ancient Lake Bandung deposits and the distribution of ancient tools in the Bandung Basin [43,44]; Bemmelen examined the geological conditions of Indonesia, especially the Bandung Basin area [45]; Klompe gave the history of the Bandung Basin to lecture material [2]; Katili examined the process of the occurrence of the Bandung highlands and the eruption of Mount Tangkubanparahu [46]; Kusumadinata (1959) examined more deeply about the place of the fall of Ancient Lake Bandung [1]; and Dam deepening the study of Ancient Lake Bandung and its climatological conditions [7,8].

3.1.6. Geo+. In addition to geology, Citatah-Saguling must be able to understand the basic knowledge of biology, paleontology, and archeology. The existence of prehistoric human fossils and fossil mollusks makes a basic understanding of archeology very necessary. Also, the presence of flora and fauna makes basic knowledge related to biology a supporting role that needs to be understood, such as bats that inhabit caves in the hills of Citatah Karst. On the other hand, the Bandung Basin area has legendary folklore, namely Sangkuriang. Legend of Sangkuriang tells about the creation of Ancient Lake Bandung, Mount Tangkubanparahu (upside-down boat), to Goa Pawon (kitchen).

Based on the explanation of the sub-section above regarding the geotourism box assessment of tourist attractions in Citatah-Saguling, 12 tourist attractions have the potential to be geotourism attraction (GA). While 7 tourist attractions that are not supported by tourism elements make it a geotourism resource (GR) that has the opportunity to be developed as geotourism (Table 2).
Table 2. Assessment of the Citatah-Saguling geotourism attraction

| No | Geodiversity | Geotourism box element | Status |
|----|--------------|------------------------|--------|
|    | Process      | Form | Tourism | Geobasic | Geohistory | Geo+ |    |
| 1  | Pawon Cave   | v    | v       | v        | v          | v    | GA  |
| 2  | Stone Garden | v    | v       | v        | v          | v    | GA  |
| 3  | Mount Masigit| v    | v       | -        | v          | v    | GR  |
| 4  | Cliffs 48    | v    | v       | v        | v          | v    | GR  |
| 5  | Cliffs 90    | v    | v       | -        | -          | v    | GR  |
| 6  | Cliffs 125   | v    | -       |         | -          | v    | GR  |
| 7  | Mount Hawu   | v    | v       | -        | v          | -    | GR  |
| 8  | Ciburuy Lake | v    | v       | v        | v          | v    | GA  |
| 9  | Sanghyang Kenit Cave | v | v | v | v | v | GA |
| 10 | Sanghyang Tikoro | v | v | v | v | v | GA |
| 11 | Sanghyang Poek Cave | v | v | v | v | v | GA |
| 12 | Bedil Waterfall | v | v | - | - | - | GR |
| 13 | Saguling Hot Spring | v | v | v | v | v | GA |
| 14 | Sanghyang Heuleut | v | v | v | v | v | GA |
| 15 | Kiara-Larang Hills | v | v | - | - | v | GR |
| 16 | Halimun Waterfall | v | v | v | v | v | GA |
| 17 | Hawu Waterfall | v | v | v | v | v | GA |
| 18 | Pangulaan Waterfall | v | v | v | v | v | GA |
| 19 | Cikahuripan Waterfall | v | v | v | v | v | GA |

3.2. Geotourism Attraction Distribution in supporting Citatah-Saguling Aspiring Geopark

The development of geotourism in the Citatah-Saguling area in support of as an Aspiring Geopark has relevance and must be following the spatial policies of West Bandung Regency, West Java Province, and national. Spatial policies that have relevance to the development of geotourism in Citatah-Saguling, including the Regional Spatial Plan (RTRW) and the Tourism Development Master Plan (Rippar) which are adapted to field conditions based on observations. Policy synthesis with observations supporting in integrating spatial elements, it aims to predict the development of tourism, especially the tourist market.

Table 3. Theme and distribution of Citatah-Saguling geotourism

| Theme          | Geotourism area       | Geotourism attraction                                                                 | Supporting attraction                                                                 |
|----------------|-----------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Karst Citatah  | Pawon Hill            | Pawon Cave, Stone Garden, Mount Masigit, Cliffs 48                                    | Prehistoric human fossils, Pawon Cave Culture Village, Pawon Cave Museum, Pawon Hill Site, Pawon Hill Ancestral Stone, Indiana Camp, Rahengan Ceremony |
|                | Padalarang            | Cliff 90, Cliffs 125, Mount Hawu, Ciburuy Lake                                       | Wana Mandala Cengkron, Kebun Buah Alam Segar, Saguling Dam and DCC Monument           |
| Ancient Citarum| Sanghyang             | Sanghyang Kenit Cave, Sanghyang Tikoro, Sanghyang Poek Cave, Sanghyang Heuleut, Bedil Waterfall, Saguling Hot Spring |                                                                                        |
|                | Cukangrahong          | Kiara-Larang Hills, Halimun Waterfall, Hawu Waterfall, Pangulaan Waterfall, Cikahuripan Waterfall |                                                                                        |
The grouping of geotourism attraction in Citatah-Saguling is divided into two regions, namely the Citatah and Saguling regions, this is based on the characteristics of the region with accessibility and is part of the spatial element in map design. The regional division aims to facilitate the development of geotourism through the determination of themes and geotourism areas. Karst Citatah and Ancient Citarum as the geotourism theme of the Citatah and Saguling areas are divided into four geotourism areas, including Pawon Hill, Padalarang, Sanghyang, and Cukangrahong (Table 3). Overall, the distribution of geotourism attraction and spatial elements in Citatah-Saguling in supporting Aspiring Geopark can be seen in Figure 3.

![Figure 3. Map of the distribution of Citatah-Saguling geotourism attractions](image)

### 4. Conclusion
This study discussed the development of geotourism in support of the Citatah-Saguling area as an Aspiring Geopark. Geodiversity is the main source in supporting the development of geotourism, besides that the existence of biodiversity and cultural diversity provide added value for tourists and help preserve it. The integration of policies and field conditions indicates the need for stakeholder involvement is needed in building Citatah-Saguling Aspiring Geopark. There are several actions that stakeholders can take in the development of geotourism in the Citatah-Saguling area, including (1) socialization of the development of Citatah-Saguling geotourism to local communities, the tourism industry, and other related institutions; (2) establishing Citatah-Saguling Geopark management body/institution; (3) designing a special geotourism development policy; (4) providing training for local communities in supporting the development of geoproducts; (5) development of geotourism routes and their interpretation for each geotourism area; and (6) if possible, expanding the development of geotourism to the Mount Tangkubanparahu area.

### Acknowledgement
This is a special tribute to the late Budi Brahmantyo who supervised my postgraduate work at Institut Teknologi Bandung in 2017-2018. For all his guidance, patience, encouragement, and advice provided throughout my time as his student.
References

[1] Brahmantyo, B.; Damajadi, D.; Kusumawadhani, S.; Bachtar, T. Geowisata Sejarah Bumi Bandung (Bandung Earth History Geotourism); Badan Geologi, Departemen Energi dan Sumber Daya Mineral: Bandung, 2006;

[2] Brahmantyo, B.; Bachtar, T. Wisata Bumi Cekungan Bandung (Bandung Basin Earth Tourism); TrueDec Pustaka Sejati: Bandung, 2009;

[3] Kunto, H. Semerbak Bunga di Bandung Raya (Fragrant Flowers in Greater Bandung); PT. Granesia: Bandung, Indonesia, 1986;

[4] Suhari, S.; Siebenhüner, M. Environmental geology for land use and regional planning in the Bandung Basin, West Java, Indonesia. Journal of Southeast Asian Earth Sciences 1993, 8, 557–566.

[5] Sungkar, A.; Ichwani, S.N.; Pratiwi, F.D.; Utari A. V.; Astuti, I.W. Conserving Cultural and Biological Resources of Pasir Pawon as Sacred Natural Site. In Proceedings of the Asian Trans-Disciplinary Karst Conference; Karst Research Group, Faculty of Geography, Gadjah Mada University: Yogyakarta, Indonesia, 2011; pp. 333–338.

[6] Brahmantyo, B. Sebuah Dokumen Tua yang Rapuh Bernama Karst Citatah (A Fragile Old Document Named Karst Citatah). In Amanat Goa Pawon; Kelompok Riset Cekungan Bandung: Bandung, Indonesia, 2004.

[7] Dam, M.A.C. The late Quaternary evolution of the Bandung Basin, West Java, Indonesia. Ph.D Thesis, Vrije Universiteit Amsterdam, 1994.

[8] Dam, M.A.C.; Suparan, P. Geology of The Bandung Basin; 1st Edition.; Republic of Indonesia, Dept. of Mines and Energy, Directorate General of Geology and Mineral Resources, Geological Research and Development Centre: Bandung, Indonesia, 1992;

[9] Dam, M.A.C.; Suparan, P.; Nossin, J.J.; Voskuil, R.P.G.A. A chronology for geomorphological developments in the greater Bandung area, West-Java, Indonesia. Journal of Southeast Asian Earth Sciences 1996, 14, 101–115.

[10] Brahmantyo, B.; Bandono; Sampurno Majalah Geologi Indonesia. December 2002, pp. 104–112.

[11] van der Kaars, W.A.; Dam, M.A.C. A 135,000-year record of vegetational and climatic change from the Bandung area, West-Java, Indonesia. Palaeogeography, Palaeoclimatology, Palaeoecology 1995, 117, 55–72.

[12] Nakayama, M. Post-project Review of Environmental Impact Assessmentfor Saguling Dam for Involuntary Resettlement. International Journal of Water Resources Development 1998, 14, 217–229.

[13] Gunawan, B.; Takeuchi, K.; Abdollah, O.S. Challenges to community participation in watershed management: an analysis of fish farming activities at Saguling Reservoir, West Java - Indonesia. Water Policy 2004, 6, 319–334.

[14] Sunardi; Gunawan, B.; Manatun, J.; Pratiwi, F.D. Livelihood status of resettlers affected by the Saguling Dam project, 25 years after inundation. International Journal of Water Resources Development 2013, 29, 25–34.

[15] Brahmantyo, B.; Yulianto, E.; Sudjatmiko, E. On The Geomorphological Development of Pawon Cave, West of Bandung, and The Evidence Finding of Prehistoric Dwelling Cave. Jurnal Teknologi Mineral 2001, 8, 239.

[16] Tarigan, A.K.M.; Sagala, S.; Samsurah, D.A.A.; Fisabiiilllah, D.F.; Simarmata, H.A.; Nababan, M. Bandung City, Indonesia. Cities 2016, 50, 100–110.

[17] Haerani, E.; Muslim, F.N.; Muslim, G.O.; Muslim, D. Human Resources in the Urban Environment of Citatah Mining Area, West Bandung Regency, Indonesia. IOP Conference Series: Earth and Environmental Science 2019, 248, 012042.

[18] Giovanni, B.C.; Ab, P.; Rahardjo, P. Development of Mount Masigit area with geopark concept. IOP Conference Series: Materials Science and Engineering 2019, 508, 012051.
[19] Wulung, S.R.P.; Brahmanyo, B. Geotourism Reinterpretation towards Natural Tourist Attractions in Bandung Basin, West Java, Indonesia. In Proceedings of the 3rd International Seminar on Tourism (ISOT 2018); Atlantis Press: Bandung, Indonesia, 2019; Vol. 259, pp. 278–282.

[20] Kartasasmita, P.S.; Falconer, J. Sustainable and Community-Based Tourism Models for Alleviating Poverty in Citarum Basin. In Proceedings of the Proceedings of the International Conference on Public Policy, Social Computing and Development 2017 (ICOPOSDev 2017); Atlantis Press: Medan, Indonesia, 2018.

[21] Geotourism; Dowling, R.K., Newsome, D., Eds.; Elsevier Butterworth-Heinemann: Amsterdam; Boston, 2006; ISBN 978-0-7506-6215-4.

[22] Olson, K.; Dowling, R. Geotourism and Cultural Heritage. Journal of Geoconservation Research (GCR) 2018, 1, 37–41.

[23] Newsome, D.; Dowling, R.; Leung, Y.-F. The nature and management of geotourism: A case study of two established iconic geotourism destinations. Tourism Management Perspectives 2012, 2–3, 19–27.

[24] Ölafsdóttir, R. Geotourism. Geosciences 2019, 9, 48.

[25] Dowling, R.K. Geotourism’s Global Growth. Geoheritage 2011, 3, 1–13.

[26] UNESCO Global Geoparks Network; UNESCO Division of Ecological and Earth Sciences Global Earth Observation Section Geoparks Secretariat., 2006;

[27] UNESCO UNESCO Global Geoparks: celebrating earth heritage, sustaining local communities; the United Nations Educational, Scientific and Cultural Organization: France, 2016; p. 20;.

[28] Brilha, J. Geoheritage and Geoparks. In Geoheritage; Elsevier, 2018; pp. 323–335 ISBN 978-0-12-809531-7.

[29] Stueve, A.M.; Cook, S.D.; Drew, D. The geotourism study: Phase I executive summary.; National Geographic Traveler/TIA, 2002;

[30] Center of Sustainable Destination Mission Programs: The Geotourism Charter 2007.

[31] Dowling, R.K.; Newsome, D. Geotourism Destinations – Visitor Impacts and Site Management Considerations. Czech Journal of Tourism 2017, 6, 111–129.

[32] Pásková, M. Local and Indigenous Knowledge Regarding the Land Use and Use of Other Natural Resources in the Aspiring Rio Coco Geopark. IOP Conference Series: Earth and Environmental Science 2017, 95, 052018.

[33] Pásková, M. Can Indigenous Knowledge Contribute to the Sustainability Management of the Aspiring Rio Coco Geopark, Nicaragua? Geosciences 2018, 8, 277.

[34] Pásková, M.; Hradecký, P. Aspiring Geopark Rio Coco (Nicaragua). In Proceedings of the Proceedings of the SGEM Conference Proceedings; Albena, Bulgaria, 2014; pp. 17–26.

[35] Al-Wosabi, M.; Al-Aydrus, A.A. Dinosaur Footprint Sites in Arhab Area: An Aspiring Geopark in Yemen. In From Geoheritage to Geoparks; Errami, E., Brocx, M., Semeniuk, V., Eds.; Springer International Publishing: Cham, 2015; pp. 167–182 ISBN 978-3-319-10707-3.

[36] Trincão, P.; Lopes, E.; de Carvalho, J.; Ataíde, S.; Perrolas, M. Beyond Time and Space—The Aspiring Jurassic Geopark of Figueira da Foz. Geosciences 2018, 8, 190.

[37] Liberatoscioli, E.; Boscaïno, G.; Agostini, S.; Garzarella, A.; Patacca Scandone, E. The Majella National Park: An Aspiring UNESCO Geopark. Geosciences 2018, 8, 256.

[38] E Errami; Ennih, N.; A Choukri; Enniouar, A.; Lagnaoui, A. The first geotrail in the Doukkala-Abda aspiring geopark (Morocco): a tool for local sustainable socio-economic development.; National Park of Cilento, Vallo di Diano e Alburni—Geopark-Italy, 2013.

[39] Wulung, S.R.P. Spatial Model Analysis of Bandung Basin Geotourism Destination, Bandung Institute of Technology: Bandung, 2018.

[40] Dredge, D. Destination place planning and design. Annals of Tourism Research 1999, 26, 772–791.
[41] Gunn, C.A.; Var, T. *Tourism planning: basics, concepts, cases*; 4th ed.; Routledge: New York, 2002; ISBN 978-0-415-93269-1.

[42] Meyer, D. Tourism Routes and Gateways: Key issues for the development of tourism routes and gateways and their potential for Pro-Poor Tourism. 2004.

[43] Stehn, Ch.E. 1929,.

[44] van Koenigswald, G.H.R. Neolithicum der Umgebung von Bandung. *1935*, 75, 394–419.

[45] Bemmelen, R.W.V. *The geology of Indonesia*; The Hague: Netherlands, 1949; Vol. 1A;

[46] Katili, J.A. Geochronology of West Indonesia and its implication on plate tectonics. *Tectonophysics* 1973, 19, 195–212.