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GEOHERITAGE PRELIMINARY EVALUATION AND ITS IMPLICATION ON GEOTOURISM POTENTIAL IN WEST BANDUNG, BANDUNG, INDONESIA

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ABSTRACT

Geoheritage is a term of geological sites that fulfill certain values and criterias which can impact the local community. The unique tectono-volcanic History of Bandung has produced several impressive geodiversity. This research aims to evaluate six geological sites (Bugbrug Waterfall Lava Ramp, Cimahi Waterfall Columnar Joint, Panganten Waterfall Columnar Joint, gunung Batu Fault Scarp, Cihanjuang Ignimbrite, and Tangkuban Parahu Ratu Crater) which are potential as Geoheritage in West Bandung District, Bandung, West Java. Quantitative evaluation was done through several parameters which include values that are important for geoheritage such as: Intrinsic and Scientific Value, Education Value, Economic Value, Conservation Value, and Added Value. This evaluation method will produce scores that will further be analyzed through qualitative means by using SWOT (Strength, Weak-ness, Opportunity, and Weakness) method and its implication on geotourism potential. Quantitative analysis shows that Geodiver-sity of West Bandung shows a good potential as Geoheritage with the final score ranges between 50.83 – 74.17%. The SWOT analysis was applied through strengths of geoheritage potential in this area, especially from Scientific, Economic, and Aesthetic Parameters. The uniqueness of West Bandung Geoheritage Potetial is currently slightly diminished due to the lack of public educa-tion aspects, the lack of significant cultural and ecologic value in several sites.

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1. INTRODUCTION

Geoheritage focuses on the diversity of minerals, rocks, and fossils, and petrogenetic features that indicate the origin and/or alteration of minerals, rocks and fssils. It also includes landforms and other geomorphological features that illustrate the effects of present and past effects of climate and Earth forces (McBriar, 1995). As the concept of geoheritage and geoconservation developed, various parameters have been made in order to assess and identify geological diversity that can be deemed as goeheritage due to their significant meaning based on predetermined parameters.

In other words, Geoheritage can be described as a term of geological sites/diversity that fulfill certain values and criterias which can impact and/or has significant value to the local community.

Geoheritage records features that represent the unique geological history from where it originated and Bandung is one of places with unique geological history in the world.

Bandung is one of places that has the unique geological history, especially its tectono-volcanic history and geological setting (Figure 1) that record the land subsidence of Bandung Basin and the eruption of Tangkuban Parahu Volcano.

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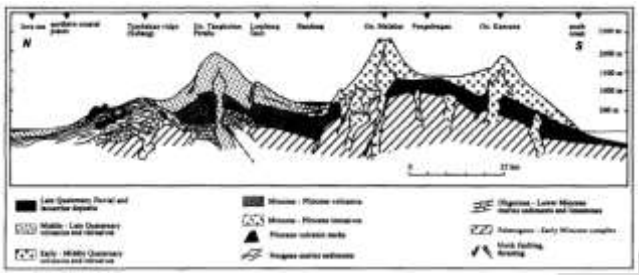

Figure 1. Bandung Quadrangle Geological Map (Silitonga, 1973), research location is situated as indicated in the red square

Geological Setting

Bandung is a great intra-mountain basin area surrounded by adjacent highland volcanoes (Dam, et al., 1996) this area extent along latitude $7^0$19' – $6^0$24' S and longitude $106^0$51' – $107^0$5' E with a total area of 2.340,9 m^2. This basin area is still a plateau with elevation around 700 – 750 meters above sea level, bandung basin mainly surrounded by two big volcanoes that formed the depression, Mt. Malabar in the south and Mt. Sunda-Tangkuban Parahu complex that forms a larger WNW – ESE mountain range in the north (Figure 2) (Dam, et al., 1996).

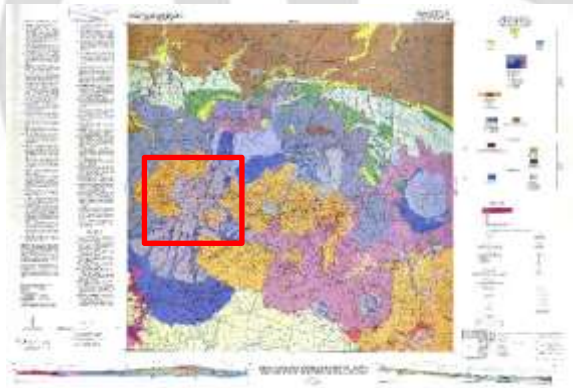

Figure 2. Structure of Bandung Intra-mountain basin (Dam, 1994).

Bandung Zone was formed due to the land subsidence and volcanic eruption, notably the explosive Sunda Mountain eruption which developed a caldera and new volcano that now known as Tangkuban Parahu Mountain. This heavy volcanic activities from two volcano which are Mt. Malabar and Sunda Complex during late tertiary to early quarternary period also induce the development of structural aspects of the Basin especially lembang fault (Dam, et al., 1996). This complex tectono-volcanic history produced older (late pliocene to early quarternary) and younger (quarternary) volcanic deposits which then enclosed by lacustrine sediments in the late quarternary period (Dam, et al., 1996). Especially around Cimahi area and around north-western part of West Bandung District, geological record selected in this research recorded this past occurrence.

Study Area

Figure 3. Study Area located in West Bandung District and a Portion of Subang District

This study is focused in the West Bandung District of West Java Province (Figure 3), one geological site is located at the border of West Bandung and Subang District so, we also include a portion of southern most part of Subang District to our study area. The field study and location were done and decided in collaboration with IAGI - MAGI (Ikatan Ahli Geologi Indonesia – Masyarakat Geowisata Indonesia) Sunda Geodiversity Investigation team, 2020.

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2. DATA AND METHOD

This research involves primary data acquisition through field observation on six geological sites of West Bandung Area that includes: Bugbrug Waterfall Lava Ramp, Cimahi waterfall Columnar Joint, Panganten Waterfall Columnar Joint, Gunung Batu Lembang Fault Scarp, Cihanjuang Ignimrite, and Tangkuban Parahu Ratu Crater. This qualitative observation then used to identify the quantitative analysis of each geological sites using Geomorphosite Assessment for Geotourism Potential based on Kubalikova, 2013

Analysis method can be divided into 4 part (Based on Nazarudin, 2017) which involve their respective analysis. Inventory involves preliminary study of each geological site location in the study area.
Characterization involves the inventory of observatory result derived from field work in collaboration with IAGI-MAGI on each geological site.

Classification involves qualitative identification and classification of each geological sites based on Nazarudin, 2017 (Table 3 and Table 4) and quantitative analysis based on Kubalikova, 2013 (Table 1, see attachment) also classification of quantative score using total score mean to classify the geoheritage potential of each site (Table 2).
Lastly, Evaluation. This part involves our final analysis using SWOT (Strength, Weakness, Opportunity, and Weakness) method and Proposal for Geoconservation type for each geological site (based on Brocx and Semeniuk, 2011 and ProGEO, 2011).

Table 2. Tentative final classification based on Geomorphosite assessment for geotourism purposes

Score interval (Mean Total %)	Class
0 – 25	Poor
26 – 50	Fair
51 - 100	Good

It should be noted that these groups of evaluation work under several principles or emphasizes (Kubalikova, 2013):

- Scientific and Intrinsic values is based on the principles of: geologically based, integrity of place, and oriented definitions of geotourism.
- Educational values consider that geosite should be environmentally educative, appealing by protection and enhancement of destination means, interactive interpretation and evaluation.
- Economic values must consider the principles of tourist satisfaction, locally beneficial, market selectivity and diversity, community involvement and benefit.
- Conservation value considers the principle of sustainable, land use and planning, and conservation of resources.
- Added value considers mainly cultural and and aesthetic aspects of the site.

3. RESULT AND DISCUSSION

Inventory

Study area involves mainly the north-eastern part of Bandung District and a fraction of southern part of Subang District due to the location of one site being exactly in the border between West Bandung and Subang District. This study involves 6 selected geological sites of West Bandung Area (Figure 4) based on collaboration with IAGI-MAGI Team as previously mentioned: Bugbrug Waterfall Lava Ramp, Cimahi Waterfall Columnar Joint, Panganten Waterfall Columnar Joint, Gunung Batu Fault Scarp, Cihanjuang Ignimbrite, and Tangkuban Parahu Ratu Crater.

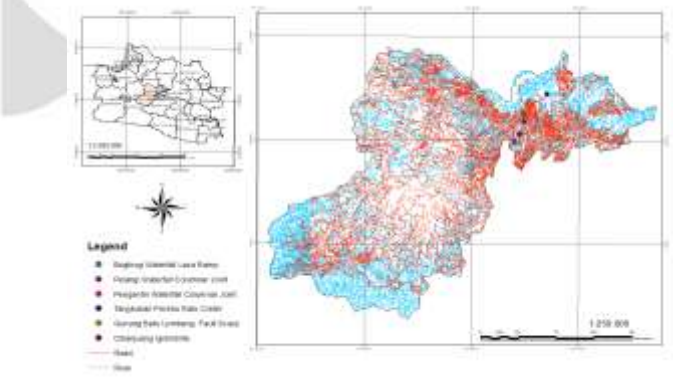

Figure 4. Location Index of Study Area in West Java Province (left picture, orange shaded area) and Geological Site Locations of West Bandung Area.

Characterization

This part includes the detailed description from field observation of each site. Many of these sites were chosen based on their scientific significance despite them being not too-well recognized. Tangkuban Parahu Ratu Crater is especially different in this aspect due to the fact that it has a good tourism aspect and already recognized even by international tourists, but there is a need for its promotion as a part of geotourism spot for its tremendous scientific significance being the biggest evidence of Sunda volcanic history in west Bandung.

Lembang Fault Scarp at Gunung Batu

This eological site (Figure 5) is located in Pagerwangi Village, Lembang, West bandung, Indonesia at latitude -6° 49' 48"S and longitude 107° 38' 9.6"E with elevation of 1.228 meters above sea level. The cliff of this fault scarp characterized by igneous lithology of porphyry-andesitic origin and predicted to be outcropped by Lembang Fault. Dam (1994), explained that Lembang Fault is included in volcano-tectonic activities that occurred due to gravitational force thus, formed a Normal Fault. Several previous researches above shown that Lembang Fault activity is highly affected by volcanic activity of Mt. Tangkuban Parahu. There is an earthquake observatory station situated at the top of the Mountain to observe tectonic activities of Lembang Fault. Subsidence rate of 3 – 3,5 mm/year.

A pair of sacred graves is situated in here which believed by the local community to be a legend. A text is carved to these graves which reads “Makam Kramat Gunung Batu Embah Jamrong dan Embah Mangkunagara” (Gunung Batu Sacred Grave of Embah Jamrong and Embah Mangkunagara). According to Cronin and Cashman (2007), this legend exists because of a natural phenomenon such as volcanic eruption which traumatized the general publics.

The attractive history, local culture, and geological records is a very strong reason to conserve the existence and wholeness of Gunung Batu, in addition this place is often used as a good tourism spot for hiking and sunset-viewing.

Figure 5. Gunung Batu view, site, and sacred graves of Embah Jamrong and Embah Mangkunagara (IAGI-MAGI, 2021)

Columnar Joint Lava at Curug Panganten

This geological site, administratively, located at Padaasih Village, Cisarua, West Bandung, West Java Province with latitude 6°50’9.71”S and longitude 107°33’56.66”E and elevation of 1.050 meter above sea level.

This waterfall has the height of 24 meters and located along the Cimahi River. The lower part of the waterfall is constructed of Volcanic Mudflow Breccia while the upper part is constructed of andesitic lava with columnar joint structure. Lava is expected to be originated from Mt. Tangkuban Parahu volcanic deposit. This geological site is included in the Qyl formation which consisted of younger lava flow from Mt. Tangkuban Parahu of basaltic characteristic with a lot of scouring from gas. Younger volcanic Deposit (P.H. Silitonga, 1973).

Aside from the geological aspects, Panganten Waterfall has a myth which is widespread among the local community. Panganten Waterfall originally named ‘Manglayang’ Waterfall, but according to the myth, there used to be a bride and bridegroom who committed suicide by falling or in other version, drifted by the turbulent flow of the waterfall hence the name Penganten Waterfall (‘Panganten’ means Bride in sundanese) (Wikipedia.org).

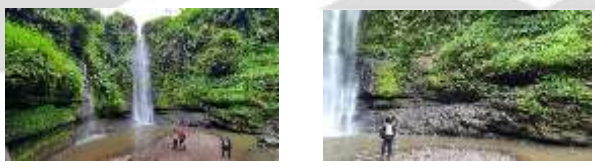

Figure 6. Panganten Waterfall (IAGI-MAGI, 2021)

Tangkuban Parahu Columnar Joint Lava at Curug Cimahi

Cimahi waterfall or also known as Pelangi Waterfall (Figure 7) is located at Jl. Kolonel Matsuri Kertawangi Village, Cisarua, West Bandung District with latitude 6°48’17,1”S, longitude 107°34’46,4”E, and elevation of 1.050 meters above sea level. The outcrop is 70 meters in height constructed of Andesitic/Basaltic Lava that shown Columnar Joint structure. Cimahi waterfall is formed as a fault-fracturing process on a rock mass that was affected by tectonic activity. This waterfall has two levels that is clearly visible as a product of intense flow and splash erosion. This geological site is included in the Qyl formation which is the product of younger lava flow of Mt. Tangkuban Parahu (P.H. Silitonga, 1973).

This geological site has been promoted as an official recreational facility since 2014 by the Chairman of PERUM PERHUTANI West Java and Banten Division. The infrastructure has been developed to facilitate access. The light facility of this site has been arranged so that it would illuminate the waterfall in rainbow ('Pelangi' in Bahasa Indonesia) color at night which is another appeal of this geological site.

Figure 7. Cimahi Waterfall (IAGI-MAGI, 2021)

Sunda Ignimbrite at Cihanjuang Village

This geological site is located at Cihanjuang Village, Parongpong, West Bandung District with latitude 6°49'24,4"S and longitude 107°34'24,2"E (Figure 8). This site is one of the explosive eruption products of Sunda Volcano, Ignimbrite (pyroclastic flow). The existence of this volcanic product is the proof of a wide and massive volume of volcanic materials that correlate with Caldera forming of Tangkuban Parahu.

Megascopically, this ignimbrite has a fresh color of white, weathered color of brownish orange, with grain size of lapilli (2 – 64 mm), moderately sorted, with grain-supported fabric, ignimbrite consisted of andesitic and basaltic fragment with vesicular/scoria structure that made the rock lightweight. Bedding thickness is about 15 meters. Cihanjuang ignimbrite is an evidence of a very vast Sunda Caldera forming. This site has been used as recreational spot for fishing which has a tranquil and fresh atmosphere.

Figure 8. Sunda Ignimbrite at Cihanjuang (IAGI-MAGI, 2021)

Lava Sheeting Joint and Ramp at Curug Bugbrug

Sheeting Joint Lava of Bugbrug Waterfall (Figure 9) is located at Kertawagi Village, Cisarua, West Bandung District, West Java with latitude 6°47'31.64"S and longitude 107°34'48.02"E.

This waterfall has the height of around 40 meters, with the lithology of Igneous Porphyry-Andesitic lava that shows a sheeting joint, lava ramp, and blocky structure. This lava is estimated to be a lava-flow products of effusive pre-Sunda eruption in Sunda Volcano Complex sheet (Soetoyo and Hadisantono, 1992). The geoemetry and viewpoint of this site makes a good recreational site and is included in CIC (Ciwangun Indah Camp) Area.

Figure 9. Bugbrug Waterfall (IAGI-MAGI, 2021)

Ratu Crater at Mt. Tangkuban Parahu

Tangkuban Parahu (Figure 10) is administratively located at Jl. Gn. Tangkuban Parahu, Cicadas, Sagalaherang, Subang, West Java with latitude 6°45'32,6"S, longitude 107°36'54,9"E, and elevation of 1.300 meter above sea level. The Ratu Crater which is located above the other crater is located at 2.087 meter above sea level.

This Volcano is a product of past volcanism that has recorded the eruption of Sunda Volcano Complex which include 3 volcaones (one of them being Mt. Tangkuban Parahu) this volcano produced lava, and volcanic sand that lies above neogen sediments (Bemmelen, 1949). The oldest layer of this site is a Miocene intercalation of marl and tufa with coral deposit.

This volcano has long been believed as a part of the folklore 'Sangkuriang' and there is also a plant called 'Manarasa' which is also believed as the secret of Dayang Sumbi's (Sangkuriang's Mother in the folklore 'Sangkuriang') youthful appearance. The name 'Tangkuban Parahu' is also believed to be related to the plot occurred in the

folklore and has long been well-known nationally. This geomorphological site is also a main tourist attraction both for domestic and international tourist due to its well-recognized magnificence.

Figure 10. Ratu Crater and Viewpoint at Mt. Tangkuban Parahu and (IAGI-MAGI, 2021)

Classification

Before using quantitative analysis method, there is a need for us to classify and describe the geological sites first. Classification and description shown in table 2 aims to give a general understanding of each site in the research location and classify them based on their Diversity type based on the geological process and product (Gray, 2005), Scope of geological site based on its diversity type (Brocx and Semeniuk, 2007; Predrag and Mirela 2010) and Scale of Geological Site (Brocx and Semeniuk, 2007).

Table 3 is a general description of each geological site from Qualitative parameter perspective, to give a general idea of how the geological site should assessed in the quantitative analysis which shown in table 4. Qualitative description from table 4 then analyzed using quantitative parameters as shown in table 5 and table 6 (Kubalikova, 2013).

The classification part of analysis is the most crucial part to produce the final score and a comprehensive understanding of each geotourism aspect from each geological site.

Table 3. Classification of Geoheritage Potential in West Bandung, West Java, Indonesia
(Modified from Nazarudin, 2017 after Gray, 2005; Brocx and Semeniuk, 2007; Predrag and Mirela, 2010)

Geological Site	Geodiversity (Gray, 2005)	Scope (Brocx and Semeniuk, 2007; Predrag and Mirela 2010)	Scale (Brocx and Semeniuk, 2007)
Lembang Fault Scarp at Gunung Batu	Landform/Landscape, Process	Gemorphological Site, Petrological Site, Structural Site	Small Scale
Tangkuban Parahu Columnar Joint Lava at Curug Panganten	Landform/Landscape, Process, Rock	Petrological Site, Geomorphological Site	Small Scale
Sunda Ignimbrite at Cihanjuang Village	Rock	Petrological Site	Small Scale
Tangkuban Parahu Columnar Joint Lava at Curug Cimahi	Landform/Landscape, Process, Rock	Petrological Site, Geomorphological Site	Small Scale
Lava Sheeting Joint and Ramp at Curug Bugbrug	Landform/Landscape, Process, Rock	Petrological Site, Geomorphological Site	Small Scale
Ratu Crater at Mt. Tangkuban Parahu	Landform/Landscape, Process, Rock	Petrological Site, Geomorphological Site, Historical-Geological Site	Large Scale

Table 4. Qualitative assessment of potential geoheritage in West Bandung, Bandung, Indonesia
(Modified after Nazarudin, 2017)

Geological Site	Scientific Value	Education Value	Economical Value	Conservation Value	Added Value	Level of Significance
Lembang Fault Scarp at Gunung Batu	Clear outcrop of Lembang fault scarp; structural control	High Clarity of Geological Features but low amount of actual use and educational infrastructure	Local community generate income by selling foods; ease of access from main tourism infrastructures	No destruction, no actual and potential risk observed of site	Geometrically appealing; local significance due to sacred tomb of Embah Jambrong and Mangkunegara (former local King and Vice Regent, respectively)	Local
Tangkuban Parahu Columnar Joint Lava at Curug Panganten	Andesitic Columnar Joint on an outcrop, stratigraphic evidence of two different volcanic products; Not many research has been conducted in the area	High clarity of Geological Features, low amount of actual use and educational infrastructure	No impact on local community yet; slightly difficult access from main tourism infrastructures	No destruction of site; Site is managed by PERHUTANI	Local myth, the death location of a pair of newlywedded couple; hence the name 'Pengatin' which means bride	Local
Sunda Ignimbrite at Cihanjuang Village	Clear cliff surface of Ignimbrite Deposit from Tangkuban Parahu past explosive eruption; Not many research has been conducted in the area	High clarity of Geological Features, low amount of actual use and educational infrastructure	Local generate income by selling foods, and facilitate fishing spot; ease of access from main tourism infrastructures	No destruction of site; potential threat from weathering due to the direct open location; managed by local community	Evidence of Sunda Caldera forming because of the explosive eruption in this site	Local
Tangkuban Parahu Columnar Joint Lava at Curug Cimahi	Andesitic Columnar Joint; Not many research has been conducted in the area	High clarity of Geological Features, low amount of actual use and educational infrastructure	Local community generate income by selling foods and local products; Ease of access and good infrastructure to facilitate access	No destruction of site; potential landslide risk	Evidence of continuous volcanism from tertiary to quarter period due to the andesite, basalt, and dacite intrusion; local beliefs/myth	Local
Lava Sheeting Joint and Ramp at Curug Bugbrug	Outcrop of Sheeting Joint and Lsava ramp from effusive eruption from pre-sunda lava flow; evidence of two different volcanic activities of Sunda Volcano.	High clarity of Geological Features, low amount of actual use and educational infrastructure	Local Community generate income by selling local products; very accessible from tourism infrastructures; CIC Tourism Spot	No destruction of site; Tourism spot under CIC Local Management	Important evidence of effusive pre-Sunda eruption, vast area for recreational purposes with visually appealing environment	Local
Ratu Crater at Mt. Tangkuban Parahu	Active crater of Stratovolcano, Volcanic Landform, Evidence of past freato-magmatic eruption, internationally-recognized tourism spot	High clarity of Geological Features, existing educational facilities such as pamphlet, infographics	Local generate income by selling foods, and selling merchandise; some locals generate income as local guides; far but ease of access from main tourism infrastructures	No destruction of site; potential threat from crowded tourism and volcanism potential; Site is managed by TWA management team	Part of the Legend of 'Sangkuriang'; a plant called 'Manarasa' is locally believed as a secret of Dayang Sumbi's ageless beauty	State

Based on the field observation and qualitative analysis, we managed to yield a quantitative evaluation of geosites in West Bandung, West Java, Indonesia.

Table 5. Quantitative assessment result for Gunung Batu Fault Scarp, Pengantin Waterfall Columnar Joint, and Cihanjuang Ignimbrite

Parameters	Geosites		
	Gunung Batu Lembang Fault Scarp	Pengantin Waterfall Columnar Joint	Cihanjuang Ignimbrite
Scientific and Intrinsic Value			
Integrity	1	1	1
Rarity	1	0,5	1
Diversity	0,5	0,5	0
Scientific Knowledge	0,5	0,5	0,5
Education Value			
Representativeness	1	0,5	1

Pedagogical Use	0	0	0
Existing educational products	0,5	0,5	0,5
Actual for educational purposes	0,5	0,5	0,5
Economical Value			
Accessibility	1	0,5	1
Presence of Tourist Infrastructure	0,5	1	1
Local Products	0	0	0
Conservation Value			
Actual threats and Risks	0	1	1
Potential threats and risks	1	0,5	1
Legislative protection	1	1	1
Current Status of a Site	0,5	0	0
Added Value			
Cultural Values	0,5	0,5	0
Ecological Values	0	0,5	0
Aesthetic Values	0,25	0,25	0,25
Total Mean (%)	52,50	50,83	52,50

Table 6. Quantitative assessment result for Pelangi Waterfall Columnar Joint, Bugbrug Waterfall Lava Ramp, and Tangkuban Parahu Ratu Crater

Parameters	**Geosites**		
	Pelangi Waterfall Columnar Joint	**Bugbrug Waterfall Lava Ramp**	**Tangkuban Parahu Ratu Crater**
Scientific and Intrinsic Value			
Integrity	1	1	1
Rarity	0,5	0,5	0,5
Diversity	0,5	0	0,5
Scientific Knowledge	0,5	0,5	1
Education Value			
Representativeness	0,5	0,5	1
Pedagogical Use	0	0	0,5
Existing educational products	0,5	0,5	0,5
Actual for educational purposes	0,5	0,5	1
Economical Value			
Accessibility	0,5	1	1
Presence of Tourist Infrastructure	1	1	0,5
Local Products	0,5	0,5	0
Conservvation Value			
Actual threats and Risks	1	1	1
Potential threats and risks	0,5	1	0,5
Legislative protection	1	1	1
Current Status of a Site	0	0	1
Added Value			
Cultural Values	0,5	0	1
Ecological Values	0,5	0,5	1
Aesthetic Values	0,25	0,25	0,5
Total Mean (%)	54,17	54,17	74,17

Evaluation

This quantitative analysis shows that the geological sites of West Bandung District have a fair potential geoheritage for geotourism purpose with a score ranges from 50,83 – 74,17 % which falls under the Good geotourism potential category. This result shows some promise that need to be evaluated further through SWOT Analysis in order to have a comprehensive understanding of potential and threats that might arise for the geoheritage potential for geotourism development in West Bandung, Bandung, Indonesia.

Table 7. SWOT Analysis of geological tourism potential in west bandung district, west java, Indonesia (Modified after Nazarudin, 2017)

Analysis	Remark
Strength	• Magnificent tourism spots that are still rarely discovered (especially Pengantin Waterfall, Bugbrug Waterfall, and Cihanjuang Ignimbrite) • Potential locations for further geological researches due to the lack of research in most of the locations • High clarity, several with visually appealing geological features • Deliver complete history of tertiary to quarter tectono-volcanic activities of Bandung and Tangkuban Parahu Volcano (Part of Sunda Volcano Complex)
Weakness	• Lack of educational infrastructure and pedagogical use in most of the sites • Lack of cultural aspects in several sites due to the lack of research on local community cultures and beliefs • Lack of supporting infrastructures at the location mainly due to fair development of sites such as Pengantin Waterfall, Cihanjuang Ignimbrite, and Gunung Batu Lembang Fault Scarp • Lack of legislative protection on sites aside from Tangkuban Parahu and Pengantin Waterfall
Opportunity	• Geotourism potential development due to the high clarity of geological features and historical geology evidence on the 6 sites which are correlated to each other • Local economy development potential with local products and food stalls in sites that might be new as a tourism spot especially merchandise related to the local myth or the site itself (Pengantin Waterfall, Bugbrug Waterfall, and Cunung Batu Lembang Fault Scarp)
Threat	• Disaster risk and threat potential (landslide and volcanic activities) • Sites are at opened location, near the city, or is a widely recognized tourism spot that make them susceptible to destruction or contamination to a certain extent • Some sites aren't widely recognized yet, and need more promotion in order to be recognized by local publics to improve protection of the sites

From this research we recognized that geoheritage potential of West Bandung, Bandung, Indonesia has the potential to be promoted as geotourism attraction. Therefore, we propose the geological sites of West Bandung to be conserved as geological sites according to their respective geoheritage conservation types.

Table 8. Proposed geoconservation type of geological sites in West Bandung, Bandung, Indonesia (modified from Nazarudin, 2017 after Brocx and Semeniuk, 2011; ProGEO, 2011)

Geological Sites	**Type of Geoconservation** (Brocx and Semeniuk, 2011; ProGEO, 2011)
Gunung Batu Lembang Fault Scarp	Geosite/Geomorphosite
Pengantin Waterfall Columnar Joint	Geosite/Geomorphosite
Cihanjuang Ignimbrite	Geosite
Pelangi Waterfall Columnar Joint	Geosite/Geomorphosite
Bugbrug Waterfall Lava Ramp	Geosite/Geomorphosite
Tamgkuban Parahu Ratu Crater	Geomorphosite

4. CONCLUSIONS

The geoheritage potentials of West Bandung district have shown a good potential for geotourism development with the score of 50,83 – 74,17%. In this research it is also recognized that most of the geological sites in West Bandung district is in a good condition and with a high potential tourism aspect that can be further developed and better promoted with low potential risks and threats. However, in order to develop these geological sites, there is a need to improve the promotion and awareness of geotourism and conservation to the general publics and to encourage the local community in producing local products and managing tourism spot.

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