

Aspiring Pangandaran Geopark to Promote Sustainable Tourism Development

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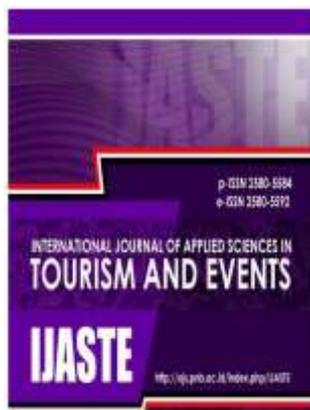
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Abstract

Purpose: The main purpose of this research is to identify and map geological and non-geological potentials based on three main pillars in the development of Aspiring Pangandaran Geopark, namely geodiversity, biodiversity and cultural diversity.

Research methods: Primary data were obtained through field observations and semi-structured interviews with actors directly involved in the tourism development of the Aspiring Pangandaran Geopark. Meanwhile secondary data collection through desk study. This qualitative study uses interactive analysis model and map analysis (using ArcGIS 10.3 software).

Results and discussions: There are 18 geological sites based on geodiversity, 2 sites which has biodiversity in the form of rare bird ecosystems, and also around 14 sites based on cultural diversity identified through desk study and field survey.

Conclusion: Each district in Pangandaran has enormous potential which is the basis for the formation of the Aspiring Pangandaran Geopark. In addition to geological sites, many non-geological sites can be developed into geotourism attractions with high cultural and biodiversity values.

Keywords: *aspiring geopark, geotourism, geopark, Pangandaran Regency, sustainable tourism*

INTRODUCTION

Pangandaran Regency is one of the regencies in West Java which is a new autonomous region resulting from the division of Ciamis Regency on October 25, 2012. In accordance with its vision of "Pangandaran Regency as a World Class Tourism Destination", making Pangandaran Regency one of the regencies that determine the sector tourism as the main economic driver. As also stated in the Tourism Development Master Plan (*RIPPARDA*) of West Java Province in 2016-2025 that Pangandaran Regency is one of the centers of Tourism Destinations in the southern part of West Java Province.

Contrary to this vision, according to the Big Plan of West Java Province World Tourism Destination Development document, published by the West Java Province Regional

Development Planning Board (*BAPPEDA*) in 2017, developing coastal tourism in the Pangandaran area tends to lead to mass beach recreation which is feared to cause potential problems if the development is left. For this reason, proper planning and policy direction is needed to develop the Pangandaran area in a sustainable manner.

Since 2015, the government, both at the central and regional levels, began to talk about tourism development priorities in Pangandaran Regency to become a world-class tourist destination that began with the initiation of the proposal for Pangandaran Regency as a *Kawasan Ekonomi Khusus (KEK)* and global geopark (Fitriani, et al. 2018). In addition to being a globally competitive destination, if these efforts (in particular the global geopark proposal) can be realized, it is hoped that the Pangandaran tourism area can further develop based on the principles of conservation, education, and sustainable economic development of the community. In accordance with the main objectives of the development of geopark.

According to Oktariadi (2015) three main pillars in the development of earth parks, namely geological diversity, biodiversity, and cultural diversity. The three pillars constitute an ecosystem order in geopark where there is a reciprocal system of abiotic elements (geodiversity) which affects the life order of biotic elements (biodiversity) and the culture of the surrounding community (cultural diversity). This is in line with research conducted by Pásková & Hradecký (2014) regarding Aspiring Rio Coco Geopark in Nicaragua where they argue that other geological and natural heritage as well as local indigenous cultures are basic capital drawings for aspiring geoparks to become part of the UNESCO Global Geopark Network for sustainable tourism destinations. Based on Republic of Indonesia Presidential Regulation (Perpres) number 9 of 2019 on geopark is:

“A single or combined geographic area, which has valuable geosites and landscapes, related to geoheritage, geodiversity, biodiversity, and cultural diversity aspects, and is managed for conservation, education and sustainable economic development of the community with the active involvement of the community and government so that they can be used separately to foster understanding and awareness of the community towards the earth and the environment” (Perpres number 9 of 2019).

Holistic concept of geopark is include conservation, education and sustainable development. All UNESCO Geopark have to promote educational activities for people all ages in order to raise awareness of geological heritage and its relationships with other aspects of natural, cultural, and intangible heritage. Nowadays based on Global Geopark Network created to education and to sustainable Development Goals for significantly contribute Sustainable Tourism development (Catana & Brilha, 2020).

Through the principles of conservation, education, and economic development for local community, geopark concept can make Pangandaran Tourism Destinasion more sustainable. Later, Aspiring Pangandaran Geopark can be determined as a national geopark, aspiring UNESCO Global Geopark, until it is determined as UNESCO Global Geopark.

Geopark involve locals in conservation's activities, and community believe that conservation the geopark improve the local economy. It can related According to the UNESCO's recommendations, the criteria for a geopark include size and setting, management and local involvement, economic development, education, protection and conservation, and global network (Farsani et al., 2011). Tavares et al., (2020) in “The Inventory of the Geological and Paleontological Sites in the Area of the Aspirant Geopark Bodoquena-Pantanal in Brazil” explained that the importance of geopark, beyond the social and economic benefit is the ability to tell geological history. To promote geopark to become sustainable tourism is considered story about geological site such as early metazoans etc.

This research is to seek and identification potential geotourism in Pangandaran to promote as sustainable tourism. In other hand, result previous research considering the presence 12 geosite among 51 inventoried with international scientific relevant to proposed to a geopark. In fact, there is no further research related to the identification of the potential of Aspiring Pangandaran Geopark based on three pillars of diversity. Previous research related to the Pangandaran Geopark aspiring was only enriched by the identification of the potential

diversity of rare bird species in prospective geopark areas to support biodiversity (Muladi et al., 2018) and the development of tourism models based on local wisdom tourism (Bakti et al., 2018).

To support the acceleration of the realization of Pangandaran Regency to become a UNESCO Global Geopark as envisioned by the local government, various initial activities must begin to uncover the potential of Pangandaran Regency to be proposed to become a geopark. In line with what was revealed by Oktariadi (2015), the Republic of Indonesia Presidential Regulation Number 9 of 2019 concerning the Development of Geoparks explained that, to make an area a geopark, adequate data and information are needed and meet the established criteria of having a geological heritage related to geodiversity, biodiversity, and cultural diversity. So this study aims to identify the potential of Pangandaran as an aspiring geopark and mapping the potential distribution based on geodiversity, biodiversity, and cultural diversity. Later it can be a reference in planning the development of geopark areas in the future Pangandaran Regency.

RESEARCH METHODS

This type of research is survey-based research. The approach used in this research is qualitative research, with an analysis unit of geodiversity, biodiversity, and cultural diversity potential (which refers to theories from Oktariadi, 2015 about the 'dimensions of geopark forming') at 10 districts in Pangandaran Regency (Cijulang Sub-district, Cimerak, Cigugur, Kalipucang, Langkaplancar, Mangunjaya, Padaherang, Pangandaran, Parigi, and Sidamulih Sub-district). This research was conducted from June 2019 to October 2019. The data used consisted of primary and the secondary data.

Primary data were obtained through field observations at Pangandaran Regency and semi-structured interviews. Secondary data collection through desk study in the form of spatial information, policy documents (*BAPPEDA*, the Department of Tourism and Culture of Pangandaran Regency, and etc), and previous studies related geoparks.

Observation activities aim to determine the position of geodiversity, biodiversity, and cultural diversity potential on satellites using some software like Global Positioning System (GPS) technology through Timestamp Camera Basic software (Version 1.101 for iOS 8.0 or later). The results of observational data are processed through data collection (coordinate transformation, digitization, and editing), data plotting, and data conversion using Geographic Information System (GIS) software (ArcGIS 10.3 for Windows 10).

Interviews were conducted with actors directly involved in the tourism development of the Pangandaran Regency, including managers of each geotourism attraction and the Tourism and Culture Office of Pangandaran Regency. The determination of data sources on the interviewee is done purposively (purposive sampling), which is chosen with specific considerations (Sugiyono, 2010). The scope of the questions in the interview related to the 'general description of tourism', 'the direction of tourism development', and 'tourism management' in the Pangandaran Regency.

This study uses interactive analysis model and map analysis. All of interview data were analyzed by applying content analysis in order to systematically exploring the content of information from the collected data (Robson, 2002; Hsieh & Shannon, 2005). The steps or stages in the interactive analysis model are divided into three concurrent flows of activity (Miles et al., 2014): (1) Data condensation (refers to the process of selecting, focusing, simplifying, abstracting, and/ or transforming the data that appear in the full corpus or body of written-up field notes, interview transcripts, documents, and other empirical materials), (2) Data display (display is an organized compressed assembly of information that allows conclusion drawing and action), and (3) Conclusion drawing. While the map analysis is done to design the Pangandaran Geopark Distribution Potential Map of Aspiring with the Steps previously described above.

RESULTS AND DISCUSSIONS

General Conditions of Pangandaran Regency

Pangandaran Regency is geographically located at coordinates 108° 41-109° E and 07° 41-07 50 S. Pangandaran Regency has 10 districts and 93 villages. In 2017, the population reached 406,898 people with an area of 168,509 Ha. Pangandaran Regency boundaries are Ciamis Regency and Banjarsari City on the north side, Parigi District on the west side, Cilacap Regency on the east side, and Indian Ocean on the southern side. Map of Pangandaran Regency administration can be seen on Figure 1.

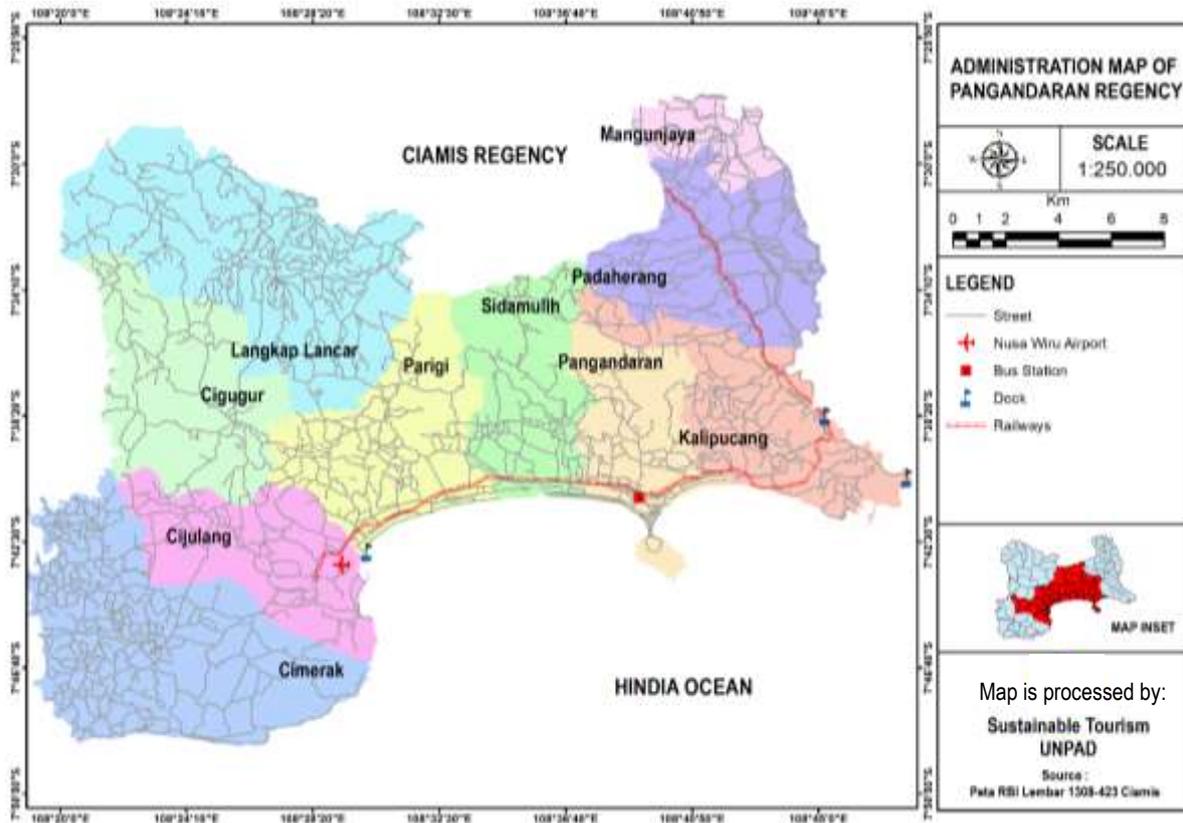


Figure 1. Map of Pangandaran Regency Administration
(Source: Processed by researchers, 2019)

From the perspective of geology, Aspiring Pangandaran Geopark and surrounding areas have 6 (six) rock formations namely jampang formation rock, pamutuan, calcutite members of Pamutuan formation, members of tuff marathon pamutuan formation, kalipucang formation, and alluvial deposits. In terms of disasters, Pangandaran's tsunami potential is at the highest position compared to other tsunami potentials in other coastal areas in West Java. The strong earthquake on July 16, 2006 provided strong evidence of environmental changes from the pre-tsunami lagoon to the mainland after the tsunami sand was deposited showing the magnitude of the earthquake that occurred at that time until a tsunami wave occurred and accompanied by land elevation. Aspiring Pangandaran Geopark itself is a tourism destination that has the main theme of coastal tourism. Seen from the beach line that has a variety of configurations ranging from white sandy beaches, rocky, with calm waters to high waves. There is also a karst area which is a diversity of geological heritage owned by Pangandaran Regency.

Potential of Geodiversity, Biodiversity, and Cultural Diversity of Pangandaran Regency

Based on the results of data verification, most of them were agreed to be inventory into three forms of diversity (geodiversity, biodiversity, and cultural diversity), so below is a mapping of potential in each district in the Pangandaran Regency (Table 1).

Table 1. Three Pillars of Aspiring Pangandaran Geopark

DISTRICTS	PILLARS		
	GEODIVERSITY	BIODIVERSITY	CULTURAL DIVERSITY
Cijulang	<ol style="list-style-type: none"> 1. Cijulang River 2. Muarabengang Cave 3. Cisamping Lake 4. Green Canyon 5. Batu Karas Beach 6. Bau Cave 7. Palatar Dermaga 2 Cukang Taneuh 	<ol style="list-style-type: none"> 1. Kertayasa Village 	<ol style="list-style-type: none"> 1. Sagati Cultural Park 2. Saung Angklung Mang Koko 3. Gurame Cultivation
Cimerak	<ol style="list-style-type: none"> 1. Hutan Pagar Bumi Beach 2. Muara Getah Beach 3. Keusik Luhur Beach 4. Cikaracak Beach 5. Legokjawa Beach 6. Bagong Cave 7. Kolor Cave 8. Madasari Beach 9. Karang Seugeuh Beach 10. Sawer Waterfall 11. Jojongor Beach 12. Pacuan Kuda Legok Jawa 	-	<ol style="list-style-type: none"> 1. Salt Mine
Cigugur	<ol style="list-style-type: none"> 1. Panorama Pasir Bentang 2. Muara Cijalu River 3. Leuwi Kerti River 4. Leuwi Leutak Waterfall 5. Deng-Deng Waterfall 6. Pagar Bumi Forest 7. Ciwayang River 8. Cipatahunan River 	-	-
Kalipucang	<ol style="list-style-type: none"> 1. Haur Mountain 2. Karang Nini Beach 3. Karapyak Beach 4. Solok Timun Beach 5. Donan Cave 6. Majingklak 7. Tpi Palatar agung 8. Nusa Werek Cave 9. Batu Kasur Beach 	-	-
Langkaplancar	<ol style="list-style-type: none"> 1. Parang Mountain 2. Langkob Cave 3. Bilik Waterfall 4. Tanjung Waterfall 5. Luhur Waterfall 	-	<ol style="list-style-type: none"> 1. KH Abdul Hamid Cultural Reserve
Mangunjaya	-	-	<ol style="list-style-type: none"> 1. Majapahit Heritage Site
Padaherang	<ol style="list-style-type: none"> 1. Pemandian Air Panas 2. Cileutik Tonjong Waterfall 3. Bunton Waterfall 4. Cipalungpung Cave 		<ol style="list-style-type: none"> 1. Dayang Sumbi Cultural Reserve 2. Syekh Muhtar Cultural Reserve 3. Jagapati Cultural Reserve 4. Gedeng Mataram Cultural Reserve

			5. Syekh Abdullah Ciayam Cultural Reserve 6. Lingga Kencana Cultural Reserve 7. Eyang KH Santarudin Cultural Reserve 8. Astana Budha Cultural Reserve
Pangandaran	1. Barat Pangandaran Beach 2. Timur Pangandaran Beach 3. Bojong Waterfall 4. Badak Paeh Cave 5. Bojong Lekor Cave 6. Pingit River 7. Jembe Enum Waterfall	1. Natural Reserve & Nature Tourism Park Pananjung	-
Parigi	1. Citumang River 2. Santirah River 3. Lanang Cave 4. Sutra Regregan Cave 5. Jogjogan 6. Batu Hiu Beach 7. Batu Lumpang 8. Pepedan Hill	-	-
Sidamulih	1. Pule Waterfall 2. Komplek Sodong Panjang 3. Karang Tirta 4. Kurung Waterfall	-	-

(Source: processed by researchers, 2019)

1. Geodiversity Potential of Pangandaran Regency

According to Presidential Regulation Number 9 of 2019 Concerning Geopark Development, geological diversity is a description of the uniqueness of geological components such as minerals, rocks, fossils, geological structures, and landscapes that form the intrinsic richness of an area and the existence of a wealth of distribution, and conditions that can represent the geological evolutionary process of the area. Following are a few examples of the diversity of geological resources owned by Pangandaran Regency:

1.1 Green Canyon

Based on the Java-Bali Spatial Planning in Republic of Indonesia Presidential Regulation Number 28 of 2012, there is a geological protection area in Pangandaran based on special interest tourism. One of the objects identified as geodiversity is Cukang Taneuh or Green Canyon (Figure 2). This Cijulang karst area may not be well known by the public at large. However, the name Green Canyon or Cukang Taneuh, has been widely known as a natural tourist attraction located about 28 kilometers west of Pangandaran precisely in the Village of Kertayasa in Cijulang District, Pangandaran Regency. In terms of hydrogeology or the study of groundwater, not many people know that Green Canyon is a karst hydrogeology, the Cijulang Karst. The name Cijulang also comes from the name of the river that divides this karst region.



Figure 2. Green Canyon
(Source: Researcher documentation, 2019)

The groundwater flow system in the karst region is unique. This is due to the fact that water becomes a media to form its own flow area by dissolving rocks that pass under the surface of the soil. If the cavities formed from the dissolution result are interconnected, then a channel will form an underground river. At ground level, a karst area may not show water flow. However, just below it, in the caves, there may be a flow of water, both in the form of channels or rivers. These waterways beneath the surface are all formed by the dissolution process. With a wealth of scientific geological heritage, has a beautiful view and has a supporting function for the environment while contributing to the civilization of the local community, especially for tourism, the Green Canyon is considered to be appointed as Geoheritage Pangandaran Regency.

1.2 Lanang Cave

Lanang Cave is located in the village of Selasari, Parigi District, Pangandaran Regency and can be reached from the Pangandaran Coastal area for approximately 1.5 hours. The nickname of Lanang Cave is because there are sedimentary rocks shaped like male genitalia (in Sundanese, its called 'lanang'). This cave is a complex cave that has 9 (nine) caves, namely Petapan Cave, Adu Stone, Karaton, Tiger, Gugurah, Petir, Bagong, Apu and, Kaharti Kabawa. Lanang Cave is a karst cave complex in which many stalactites are found - stalactites with unique shapes (Figure 3). In terms of geology, related to the unique process of stone formation, it can be a source of interpretation to educate tourists. Because Interpretation is an important component in the development of geotourism (Wulung et al., 2019b).



Figure 3. Lanang Cave
(Source: Researcher documentation, 2019)

1.3 Bojong Waterfall

Bojong waterfall is located on the river Ciputrapinggan at coordinates 108° 40 '43.3" E and 7° 38 "46" S. This waterfall has a height of 5.5 m and is arranged by the Volcanic Breccia unit of the Jampang Formation, with the Monomic Components of Andesite Frozen Rock (Figure 4). In general, geologically the waterfall does not show any layers, the breccias that are exposed have a matrix of fresh gray tuff and weathered grayish black, hard, there is a Vesicular structure, large grains of medium-coarse, medium disaggregated, closed container, and there are Kuarssa, Biotite, and Feldspar Minerals. The Volcanic Breccia Unit is estimated to be in early Oligocene-Miocene age.



Figure 4. Bojong Waterfall
(Source: Researcher documentation, 2019)

2. Biodiversity Potentials of Pangandaran Regency

According to Oktariadi (2015), biodiversity is a term to express the level of biodiversity of natural resources which covers their availability and distribution of ecosystem diversity, species diversity, and genetic diversity. Biodiversity is part of the ecosystem which is very important not only for the sustainability of the ecosystem itself, but also is important for human life now and in the future (Withaningsih, 2017). The following below is an example of the biodiversity owned by Pangandaran Regency:

2.1 Bird Species Diversity in the Pananjung Nature Reserve and Cijulang Karst Areas

Based on the study of literature from the results of research conducted Mulaidi et. al, (2018) related to bird species diversity REEPS (Rare, Endangered, Endemic, Protected Species) in the Pangandaran Geopark Area candidate, West Java, the total number of bird species found in 45 species from 24 families with 14 species of birds found in both locations namely Pananjung Pangandaran Nature Reserve and Kertayasa Village. Then the diversity of bird species and the number of birds with protected status based on Government Regulation (PP) Number 7 of 1999 and CITES Appendix I and II in the Pananjung Nature Reserve and Nature Tourism Areas are higher than those in the Cijulang non-conservation karst area.

In the prospective geopark area there are 45 species of birds from 24 families, 40 of them were found in the Pananjung Pangandaran Nature Reserve, 19 species were found in Kertayasa Village, Cijulang District, and 14 species of birds were found in both locations. Recorded species of birds that dominate in both places are from the family Pycnonotidae with five species observed, namely Cucak Kuning (*Pycnonotus melanicterus*), Cucak Kutilang (*Pycnonotus aurigaster*), Merbah Belukar (*Pycnonotus plumosus*), Merbah Cerukcuk (*Pycnonotus plumosus*), and Merbah Corok-corok (*Pycnonotus simplex*).

2.2 Abiotic environment that supports biotic ecosystems in nature reserves and Pananjung Nature Tourism Parks

The Nature Tourism Park (NTP) and Nature Reserve (NR) Pananjung are located in one Pangandaran peninsula area with coordinates of -7.703608 S - 108.659184 E. Taman Wisata Alam occupies a small portion of the outer portion of the Pangandaran peninsula

(North, West and East) covering an area of 34,321 Ha, while the Nature Reserve covers an area of 454,615 Ha.

In the NTP and NR Panananjung areas there are diverse geological, biological and archaeological sites (Figure 5). Geological diversity that is there are Panggung Cave, Pangandaran Waterfall, and Layar Stone. While biodiversity in NR there are Cikamal Savana, fauna of monkeys, deer and buffalo, as well as flora such as Rafflesia Arnoldi (Bangkai Flower). While, then the existing archaeological site is the Kalde Stone Site and patilasan, one of the prominent figures who spread Islam in Pangandaran.

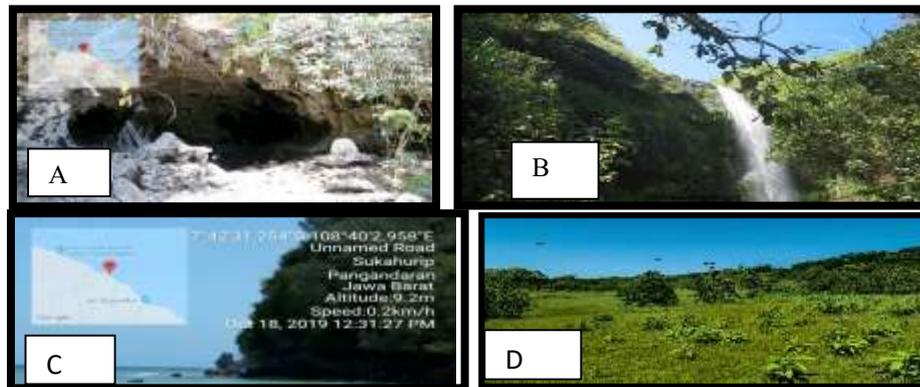


Figure 5. A) Panggung Cave; B) Pangandaran Waterfall;
C) Layar Stone; D) Cikamal Savana
(Source: Researcher documentation, 2019)

3. Potential Cultural Diversity of Pangandaran Regency

Cultural diversity is the work of art and culture of the surrounding community which is the result of human interaction with the natural surroundings. Cultural diversity is related to the understanding of local communities in responding to existing natural conditions (Oktariadai, 2015). According to Bakti et al., (2018), Tourism potential in Pangandaran is not only beach tourism, but also cultural tourism, because in the region there are many sites of 'Sunda Buhun' relics, both in the form of sacred tombs and the appearance of ancient figures, as well as various ritual inheritance of the elders in ancient times. The following below is an example of the cultural diversity of Pangandaran Regency:

3.1 Badud Art

Badud traditional art is an art that was born in Kampung Badud, Margacinta Village, Cijulang District, Pangandaran Regency (Maulana et al., 2019) (Figure 6). Where this art has been around for a long time and the exact number of years is not known. In the beginning, the performance of Badud art became part of the ritual when the harvest arrived, namely at the accompaniment session where the community brought the harvest to the granary in the village. The session had recorded the year number, which was 1928.

According to the narrative of Aki Ardasim and Aki Ijot which are karuhun in Kampung Badud, Badud Art is estimated to have existed since 1880 in Margajaya Hamlet. The role material is then added by wearing animal mask attributes such as langurs, monkeys, coyotes, tigers and boars made with makeshift materials. With dance movements mimicking the movements of animals in accordance with the masks they wear.



Figure 6. Badud Art
(Source: Researcher documentation, 2019)

3.2 Angklung Mang Koko

Angklung Mang Koko is from Margacinta Village, Cijulang District, Pangandaran Regency (Figure 7). In Angklung Mang Koko there are various types of angklung sizes ranging from normal to measuring 2-7 meters, then the shape is different from the angklung that we usually know. This can be seen from the amount of bamboo used consisting of 3 bamboo pieces. Locals used to call him by the name of Roel. The number 3 bamboo means father, mother and child. This Angklung is a development from angklung which is commonly used on Badud musical instruments. Along with the development era Mang Koko also modified the Badud angklung into a modern angklung. Angklung which is usually played is usually moved sideways, but Mang Koko now also creates an angklung that can be moved like we play the piano, which is then called 'Angklung Toel'. But the sound or sound that comes out does not change the original sound of an angklung, it's just that Mang Koko changes the way he plays the angklung. Tourists can enjoy and learn to play angklung instruments and can also shop for souvenirs for sale.



Figure 7. Angklung Mang Koko
(Source: researcher documentation, 2019)

Mapping the potential distribution of Pangandaran Regency as an Aspiring Geopark

The points observed in this study were focused into two zones, namely the western zone (Cijulang District and Parigi District) and the eastern zone (Pangandaran District). Of the ten districts, the two zones have their respective characters (themes) that can be raised in the development of the geosite. The eastern zone is identical to the coastal area (with a length reaching 91 Km), while the western zone is identical to the karst area (15 km to the west of the eastern zone).

Based on the results of interviews with the Tourism Destination Management Sector, the Tourism and Culture Office of Pangandaran confirmed the direction of developing the Aspiring Pangandaran Geopark by taking up the theme:

"For the Aspiring Pangandaran Geopark, we push it not for the coast if we can, but for other unique things, such as our geological potential, we have karst and outcrops of breccias formed in the Jampang formation about 18 million years ago to the west" (Dudung Cahyadi. Interview results, 2020 October 17)

From the potential geodiversity and biodiversity that have been identified in the previous chapter, geological sites whether mountains, jungles, oceans, mountains, or rivers are all in Pangandaran. While cultural diversity will be a supporter or added value for the Aspiring Pangandaran Geopark. The development of special interest destinations such as geopark also requires a management system (Siti 2001; in Suarta et al., 2017) and appropriate market targets or segmentation (Utama et al, 2019).

Adopting these two quotations, product differentiation from each geosite can be a future development program after it has been determined which geological sites will be geoheritage and which geological sites will be used as primary geotourism attractions. Based on the existing conditions, the differentiation pattern planned by the Head of Tourism and Culture of the Pangandaran Regency refers to the spatial pattern of the base camp (Putra et al., 2020). This pattern makes the Pangandaran Beach Area a gateway complex (main entrance) and staging area (staging areas that keep tourists staying with adequate safety and accessibility), then tourist attractions outside the area can be attractive options to visit afterward. This is in line with what the Head of Tourism and Culture of Pangandaran said:

"... to make tourists feel at ease ... the food is spoiled, the setting is also ... hotels, restaurants, travel agents, guide services of all kinds to the money exchange there (in Pangandaran Beach Area) ... so one day in Pangandaran which is the core ... then it can go to power Another tourist attraction ... " (Undang Sohbarudin. Interview results, 2020 October 17)

This pattern can certainly support the differentiation of geotourism attraction products that are scattered in Pangandaran by grouping them into several geosites. This is consistent with previous research related to geotourism route planning on Natuna Island, which says that the distribution of geodiversity can be a potential for geopark development with thematic geotourism (Wulung et al., 2019).

Following below are the results of mapping the potential points and tourist attractions in the two regions (Figure 8). At least in the western region found 11 potential geodiversity-based tourist attractions (5 sites in Cijulang District, 5 sites in Parigi District and 1 site in Sidamulih District). Then in the eastern region or in Pangandaran District, 4 geodiversity-based tourist attractions are found, as well as 1 biodiversity, geodiversity and cultural diversity-based tourist attraction.

Based on the results of the field observations, the region of Pangandaran Regency as a geopark candidate can be delineated based on the abundance of existing geological features. Those are three geosites which have great opportunities to be developed into geopark, namely Pangandaran Coastal Geosite, Parigi Geosite, and Cijulang Karst Geosite (Figure 8).

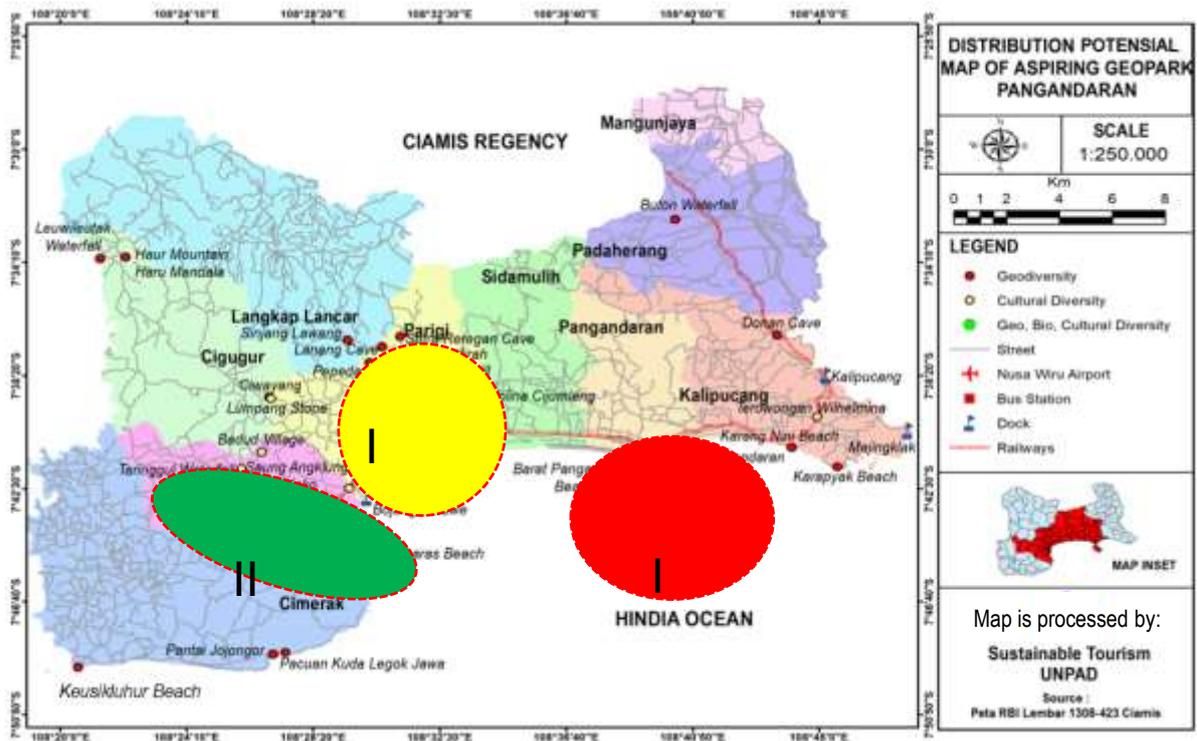


Figure 8. Distribution Potential Map of Aspiring Pangandaran Geopark
(Source: processed by researchers, 2019)

- I. **Pangandaran Coastal Geopark** consists of 3 sites. Geological site-based on geodiversity, namely: Timur Pangandaran Beach and Barat Pangandaran Beach. And then, geological site - based on geo, bio and cultural diversity in the NR and NTP Pananjung;
- II. **Parigi Geopark** consists of 6 sites. Geological site - based on geodiversity, namely: Citumang River, Jojogan Wonder Hill, Batu Hiu Beach, Lanang Cave, Pepedan Hill and Reregan Silk Cave; and
- III. **Cijulang Karst Geopark** consists of 7 sites. Geological site-based on geodiversity, namely: Bau Cave, Green Canyon, Batu Karas Beach, Cisamping Lake. And then, geological site-based on cultural diversity, namely: Sagati Cultural Park, Saung Angklung Mangkoko and Badud Art.

CONCLUSION

In addition to geological sites, there are also many non-geological sites in Aspiring Pangandaran Geopark that can be developed into geotourism attractions and tourist attractions with high cultural diversity and biodiversity values for provision as Aspiring Pangandaran Geopark. There are 18 geological site-based on geodiversity, 2 geological site which has biodiversity in the form of rare bird ecosystems, and also around 14 geological site-based on cultural diversity, identified through literature studies and field verification.

Subdistrict which has three pillars of diversity is Cijulang Subdistrict, where the Subdistrict is a karst area. Referring to the geological and non-geological potential in Pangandaran, the capital of Pangandaran Regency is a geopark area. So that in the future, with information on the potential of the three aspects of diversity pillars, it can be a reference for making development plans to accelerate Pangandaran Regency which aspires to become a national geopark, until being a global geopark or better known as UNESCO Global Geopark (UGG). This geopark concept is expected to make Pangandaran Regency as a sustainable tourism destination.

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