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## VISUAL LANDSCAPE ANALYSIS OF COASTAL TOURISM POTENTIAL IN GEOPARK CILETUH-PALABUHANRATU INDONESIA

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Abstract. The coastal area is one of the strategic resources, since it is a transitional area between the ocean and land ecosystem. As a region having high potential of natural resources and environmental services, a variety of interests rests on it, so that many parties are interested in managing and regulating its use, one of which is as an area which attracts tourists. At present, Indonesia has the UNESCO Global Geopark in Ciletuh-Palabuhanratu. The area has potential which must be utilized properly for the welfare of the community. Thus, it is necessary to evaluate the feasibility of the land which would potentially be developed. This study aims to (1) analyze the land suitability in terms of tourism; (2) assess the scenery of the coastal tourism landscape in the area of Geopark Ciletuh-Palabuhanratu. The method used was the Geographic Information System (GIS) method using survey technique. The GIS method has two main functions: the ability to identify data (query) and analysis. Data query can connect between spatial data and attribute data. The query function on spatial data is in terms of data/location search and overlay of several maps. The approach in assessing the aesthetic quality of the landscape used the SBE (Scenic Beauty Estimation) method. The result showed that there were 12 objects found in Ciemas Subdistrict which consisted of attraction points, waterfall, and beach. Based on the SBE assessment, each category, namely low, medium and high, had the same number of objects, namely 4 objects. The result of the assessment of the beauty index of the landscape was expected to be a consideration in the development of new tourism objects in the area of UNESCO Global Geopark Ciletuh-Palabuhanratu.

Keywords: Tourism suitability, tourism, Landscape Assessment Index, UNESCO Global Geopark

### AIMS AND BACKGROUND

Indonesia is a country located in a highly strategic geographical area. The position of the Indonesian is in between two continents, namely Asia and Australia, and two oceans, namely the Pacific and the Indian Oceans. Such a geographical situation results in Indonesia having an abundant amount of marine wealth. Furthermore, Indonesia is traversed by the equator, hence the tropical climate with two seasons being the dry and the rainy seasons. Indonesia is also the largest island nation in the world consisting of 13,466 islands, with the second longest coastline in the world, reaching 54,716 km and a coverage area of 1,904,569 km2.<sup>1</sup>

As an archipelago with a long coastline, Indonesia has various types of beaches. The type of beach found along the coastline has many variations, such as sandy, muddy, rocky, and steep thick beaches with a variety and distinctive natural scenery. The coastline of Indonesia, which is on the outside of the archipelago, is directly adjacent to the Indian and the Pacific Oceans.

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Such a fact causes the coastline to be significantly dynamic in terms of changes, in which the area is highly affected by the tides of the sea and the ocean waves.

The well-maintained natural condition of the coast is indeed a unique point for tourism destination. Natural conditions make the dynamics of the coast do not lead to an impact, the processes which occur would run optimally<sup>2</sup>. Coastal areas in the southern part of Indonesia, especially in Java, have mostly been influenced by humans. The involvement of humans in the coastal areas as a tourist destination has resulted in various negative impacts, including the construction of ponds around the coast, the construction of stalls, the use of conservation areas for tourist facilities, the number of fishing boats anchored carelessly, coastal reclamation, and the amount of garbage and unprocessed waste in the sea, which result in the coastal area no longer being highly aesthetic<sup>3</sup>. The impact caused by waves and ocean currents also increases due to lack of knowledge of good coastal management<sup>4</sup>.

The impacts on the coast can be minimized by the presence of conservation areas<sup>5</sup>. One of the conservation areas, Geopark, is a natural area of which authenticity is preserved in accordance with the habitat of flora and fauna found in the coastal areas, involving aspects of geo diversity, biodiversity, and cultural diversity<sup>6</sup>.

The existence of a conservation zone, such as Geopark, can be used as natural tourism in the coastal area. Natural conservation areas also have high aesthetic and good suitability without any negative impacts. However, if the conservation area is not well management, degradation is most likely to occur, since the conservation area not maintained according to its designation. Therefore, an appropriate approach is needed. Management considerations and recommendations are made to support the tourist area to be sustainable and can be enjoyed by tourists and visitors.

To improve the standard of living of the local community, tourism potential based on the area was developed. Tourism potential in the area of Unesco Global Geopark Ciletuh-Palabuhanratu is currently developed. The existing potential tourism, as a matter of fact, cannot attract many tourists. One of the aspects which must be studied is the potential object in the area for tourism activities in order to add value to the benefits of the establishment of the Geopark Ciletuh-Palabuhanratu as part of the UNESCO Global Geopark Network.

Natural tourist destinations should have high aesthetic value. Based on the high potential of the Geopark area, it is necessary to identify potential tourism objects which have not been managed efficiently by the management or the local community. Therefore, a number of research questions are formulated: (1) How is the distribution of potential tourism objects in the area of Geopark Ciletuh-Palabuhanratu?; (2) How is the aesthetic condition of the landscape for tourism in the area of Geopark Ciletuh-Palabuhanratu? This study aims to identify the object distribution of tourism potential, and to assess the beauty of the potential tourism landscape in the area of Geopark Ciletuh-Palabuhanratu, Indonesia.

#### **EXPERIMENTAL**

The method used in this study was the Geographic Information System (GIS), of which implementation used the survey technique. Survey can be used for descriptive purposes, using sampling technique from the population through field observation technique, interview, questionnaire, literature study, and documentation study.

The research location was in the area of Geopark Ciletuh-Palabuhanratu which consisted of 8 Subdistricts, including Cisolok, Cikakak, Pelabuhan Ratu, Simpenan, Waluran, Ciemas, Ciracap, and Surade. This area encompasses 74 villages divided into three geoareas, namely Geoarea Ciletuh, Geoarea Simpenan, and Geoarea Cisolok. The area of Geopark Ciletuh-Palabuhanratu is approximately 205 kilometers from Bandung, Indonesia.

In geology, the Ciletuh area in Ciemas Subdistrict, Sukabumi Regency, West Java Province is known as one of the three places in Java which reveals a group of old-age rocks in Java (Pre-Tertiary to Pre-Middle Eocene). Geomorphologically, the landscape of Ciletuh and its surrounding areas is part of the morphology of the Southern Java Mountains, in the form of undulating mountains of varied heights. One of the Ciletuh morphology that resembles an amphitheatre has its own attraction for tourism<sup>7</sup>.

#### 1. Tourism Potential Mapping

The GIS method has two main functions: the ability to seek for data (query) and analysis. Data query can connect between spatial and attribute data. The query function in spatial data is to seek for data/location and overlay of several maps. Location search is based on established criteria, such as buffer and information contained in the buffer area. Map overlay can use objects (feature) on two or more maps (layer). In this study, the overlay was in the form of vector<sup>8</sup>. The overlay function is used to find out areas which have the potential for coastal area tourism. The survey result in the form of points along with documentation is the output in the form of a potential map of Geopark Ciletuh tourism area.

### 2. Aesthetic Assessment Index

The approach in assessing the aesthetic quality of landscapes is a method of estimating the value of beauty. SBE (Scenic Beauty Estimation) is a typical method for assessing the beauty of landscapes<sup>9</sup>. The underlying concept is the beauty of the landscape as a result of the interaction between nature and human beings through the human sense of sight. Each human being has a different perception of the beauty of a panorama. There are those who see it from the number of colors, the proportion of natural formations, weather, to the many phenomena that can be seen in one particular location. However, a beauty must have an order which can be enjoyed by the human senses. Order makes beauty have value. Therefore, beauty is seen as one of the perceptions which can be assessed. Assessment was conducted by capturing photos directly which were expected to represent the condition of the landscape as a whole in one particular appearance. The stages of implementing the SBE analysis are as follows.

- Capturing photos

Photo capturing was conducted parallel to the human eye (observer) who stood in a normal position. The photos were randomly captured according to the appearance that represented the landscape. The lighting in capturing the photos was also considered to maximize the quality of the photos.

- Photo selection and assessment by respondents

Photo selection was conducted by selecting photos captured in the field which were considered to represent the landscape condition followed by editing to match the lighting, so that the respondents focus on the landscape image. The assessment by respondents could be conducted directly on the spot, using presentation slides, or online media. The photos were rated on a scale of 1 (not aesthetic) to 10 (highly aesthetic).

- Calculation and analysis

The result of the assessment was recapitulated by a number of samples and was calculated statistically using the SBE formula<sup>9</sup>.

SBEx = (ZLx-ZLs) x 100 Description: SBEx: SBE value to x ZLx: average value of z to x ZLs: standardized average value of z

# **RESULTS AND DISCUSSION**

After the field survey, it was found that there were 12 points of tourism potential, in which the 12 points had different types of attraction, ranging from waterfalls, amphitheater, and beaches. The diversity of the tourism attractions is inseparable from the Geopark being unique and exotic. Most of the objects identified had not been found on the map of tourism objects in the Geopark Ciletuh-Palabuhanratu, but there were a number of tourism objects which have entered the map of tourism objects despite the potential not being optimal seen in terms of accessibility and facilities. Fig 1 shows the geopark location and distribution of tourism potential location.



Fig 1. Ciletuh Geopark Tourism Potential Map

The collected data were processed using the SBE (Scenic Beauty Estimation) technique. The analysis was based on the average z value (normal distribution) for each landscape. The result of the SBE calculation was in the form of aesthetic quality value from low to high, and was divided into 3 classes (low, medium, and high). Twelve points of landscape were sampled in Ciemas Subdistrict.

For the landscape assessment based on the Scenic Beauty Estimation (SBE) method, the calculation result showed mixed result. There was a landscape which looked highly aesthetic, and also a landscape which looked less aesthetic, with a range of values from -108.1 to 94.8. The SBE method proved to be an efficient and objective method in estimating the beauty of a landscape<sup>9</sup>. In this study, the landscape photos focused on the natural scenery. Based on the respondents, the most interesting photo landscape was found in object 3, Curug Badak (Badak Waterfall). Of the 30 respondents, as many as 12 respondents rated Curug Badak with 7. Visually, Curug Badak looks refreshing, since if seen from the surrounding area, the waterfall is close to a rice field.

The result of the SBE in terms of the beauty of the landscape was divided into 3 groups, namely high quality, medium quality, and low quality. The classification was made using a simplified rating, proposed by Khakhim<sup>10-11</sup>.

$$I = \frac{\text{High Value-Low Value}}{\text{Total Class}}$$
$$I = \frac{94,8-(-108,1)}{3}$$
$$I = 67,64$$

Description: I = Class Interval

Based on the calculation, there are 3 groups of landscape assessment indices, namely high, medium, and low. The objects included in the category of high quality landscape are Curug Badak, Curug Panganten, Karang Daeu Beach, and Puncak Tugu. Based on the 4 tourism objects, there is a similarity, namely green scenery. Fig 2 show the value of Scenic Beauty Estimation (SBE) of the Geopark tourism potential. In this study the classification of scenic beauty estimation (SBE) value shown at table 1.



Fig 2. Graph of SBE Value

| Object | Object Name         | Score    | Description |
|--------|---------------------|----------|-------------|
| 1      | Cekdam I            | -108.126 | Low         |
| 2      | Cekdam II           | -90.15   | Low         |
| 3      | Badak Waterfall     | 94.80    | High        |
| 4      | Larangan Waterfall  | -43.33   | Low         |
| 5      | Numpang Waterfall   | 24.08    | Medium      |
| 6      | Panganten Waterfall | 69.37    | High        |
| 7      | Tengah Waterfall    | -15.98   | Medium      |
| 8      | Puncak Manik        | -100.02  | Low         |
| 9      | Puncak Manik II     | 9.36     | Medium      |
| 10     | Cikeueus Beach      | 21.05    | Medium      |
| 11     | Karang Daeu Beach   | 80.97    | High        |
| 12     | Puncak Tugu         | 57.98    | High        |

Table 2. The Classification of Scenic Beauty Estimation (SBE) Value

In the medium quality, there are 4 tourism objects, namely Numpang Waterfall, Tengah Waterfall, Puncak Manik II, and Cikeueus Beach. The values included in the medium category are between -40.5 to 27.1. Moreover, the low category ranges from -108.1 to -40.4; there are 4 tourism objects included in this category, namely Cekdam I, Cekdam II, Curangan Larangan, and Puncak Manik. In the object with the lowest value, namely Cekdam I, 14 of the 30 respondents rated this tourism object with 4 showing that the landscape is less attractive to the respondents.

#### CONCLUSION

There were 12 points of potential tourism objects with different attractions. Each of the 12 objects has diverse SBE value which was divided into 3 categories, namely high, medium, and low quality. The objects included in the high category are Badak Waterfall, Panganten Waterfall, Karang Daeu Beach, and Puncak Tugu. Tourism objects included in medium quality categories are Numpang Waterfall, Tengah Waterfall, Puncak Manik II, and Cikeueus Beach. Furthermore, the low category consisted of Cekdam, Cekdam II, Curug Larangan, and Puncak Manik. The result of the SBE calculation was an objective result based on the assessment of 30 respondents, in which the result of the calculation can be used as a reference in the development of new tourism objects in the area of Geopark Ciletuh-Palabuhanratu, Indonesia.

#### REFERENCES

- 1. BIG: Geographic and toponymy survey results, Geospatial Information Agency, http://www.bakosurtanal.go.id/ (accessed at 20.12.2018).
- NANDI: Morphodynamics of Coastal Lagoons: An Analysis of Multitemporal Landsat Images of Segara Anakan Lagoon Area, Pertanika J. Sci. & Technol. 26 (1): 409 - 426 (2018)
- 3. NANDI., L. SOMANTRI, G. MEIRINA: Monitoring the land accretion development at coastal area of Blanakan, Subang Indonesia. IOP Conference Series: Earth and Environmental Science, 47, 012017. (2016)
- 4. NANDI: Coastal conservation policies and integrated coastal zone management (ICZM) in Indonesia. Int J Conserv Sci 5, 3: 387-396 (2014)

- NANDI., D.S ROHMAN: Spatial modelling of tsunami inundation zone in the southern coastal area of West Java Indonesia, J of Engineering Science and Technology. Special Issue on AASEC'2016, October, 34 – 41 (2017)
- 6. N, ZOUROS: Global geoparks network and the new unesco global geoparks programme, Bulletin of the Geological Society of Greece, 50, 284-292 (2016)
- 7. M.F. ROSANA: Geology of Ciletuh Region, Sukabumi: Characteristics, Uniqueness and Implications. Universitas Padjajaran (2006).
- 8. M.N. DEMERS: *Fundamentals of Geographic Information Systems*. New Mexico State University. John Wiley & Sons, Inc. (1997).
- 9. T. C. DANIEL, R. S. BOOSTER: Measuring Landscape Esthetics: The Scenic Beauty Estimation Method. USDA Forest Service Research Paper RM-167. U.S. Department of Agriculture. (1976).
- 10. N. KHAKHIM: Study of the Coastal Physical Typology of the Special Region of Yogyakarta to Support the Development and Management of Coastal Areas. Dissertation. Postgraduate School. Bogor: Institut Pertanian Bogor. (2008).
- N. KHAKHIM: Yogyakarta Special Region Coastal Visual Preference Analysis for Coastal Tourism Development towards Management of Sustainable Coastal Areas. J Forum Geografi, 22(1):44 – 59 (2008)