Analysis of ecotourism potentials of Botutonuo Beach in Bone Bolango Regency, Gorontalo Province

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Abstract. The ecotourism potential of the beach area in Bone Bolango regency, if developed optimally, is very high. Ecotourism development is a tourism activity that incorporates the principles of environment-friendly attitudes. It emphasizes the aspects of nature conservation, empowerment of the local community’s economic, social, and cultural competence, as well as education. Botutonuo beach is among the coastal areas in Bone Bolango regency with high ecotourism potential. The present study aimed to analyze the ecotourism potential of Botutonuo beach based on the physical, sociocultural, economic, and institutional parameters. It employed an ecological-spatial approach by involving the Geographic Information System (GIS). The research method comprised field observation; the data were retrieved by field measurement, interview, and questionnaire. The data were analyzed in a quantitative manner with descriptive statistical analysis, scoring analysis, and qualitative descriptive analysis to result in the final evaluation score of the site’s ecotourism potentials. The analysis result on the site’s physical parameters (vegetation, environmental hygiene, materials, and water brightness) indicated that the Botutonuo beach has high potential. The same criteria were also given in other physical parameters that consisted of distance, facilities, accessibility, and site attractiveness. Moreover, high ecotourism potential was also shown by the site’s other parameters (institutional, sociocultural, economic, and environmental parameters). The site’s high ecotourism potential was due to the beach’s characteristics. The site is a sandy beach that is naturally formed. On top of that, the community’s contribution to constructing tourism facilities was influential in boosting the ecotourism potentials.

1. Introduction
The Bone Bolango Regency is one of the regency in Gorontalo province, which has many tourism potentials. Its natural and cultural diversity are the capital for development of tourism attraction, source of local revenue and economic growth. Currently, only small part of these natural and cultural potentials are explored to attract local and foreign tourists [1]. Locally, Gorontalo tourism potentials are supported with its morphological and geological structures, such as natural resources potentials, limestone distribution, and geological structure [2–6].

The coastal area of Bone Bolango regency is potential to be developed as eco-tourism sites. The Domestic Affair Ministry’s regulation No. 33 of 2009 on Ecotourism states that ecotourism is a responsible natural tourism in the local area, which takes into account environmental education, environmental awareness, and supports natural conservation efforts, and increases local income. In addition, the main target of this ecotourism is to integrate conservation efforts, community, and
sustainable development [7]. These are things that should be considered in planning and development of ecotourism industry [8]. Ecotourism offers the balance of integrated tourism values between enjoying the nature and preserving it. It is an important element of sustainable tourism [8,9]. This ecotourism provides solution for tourism development problems. Ecotourism development brings social, economic, and environmental benefits of natural resources utilization and has direct impact on the increase of local revenue [10-12].

Botutonuo beach is a highly potential site for ecotourism in Gorontalo and its surrounding area. This beach has a long white sandy beach and a beautiful mountain view as its backdrop. These natural resources advantages are potentials to be developed as an ecotourism site. Through ecotourism, community is expected to be able to utilize this natural, cultural, and historical potential without having to destroy or sell them. This carrying capacity concept is developed to minimize the destruction or degradation of natural resources, hence, the preservation, the existence, and the function of the nature can be achieved, and at the same time community, as user of this natural resources also gain benefits [13]. This tourism destination is developed synergically with amenities, public facilities, accessibilities, and community empowerment in sustainable and integrated ways [1]. Therefore, an analysis of ecotourism potentials is important to be carried out as currently there is no research on ecotourism potentials in Botutonuo Beach site. Hence, this research aims at analyzing the ecotourism potentials of the Botutonuo beach based on its physical parameters of socio-cultural, economic, and institutional parameters.

2. Research methods
This research employs spatial ecological approach with Geographical Information System (GIS). Data collected in this study are primary and secondary data, where primary data are collected through observation method (directly taken from the field), interview, and distribution of questionnaire. Whereas, secondary data are obtained from interview with related stakeholders and literature review. Quantitative analysis is also employed in this study, in which descriptive statist method is used to interpret the feedback of the questionnaires, and scoring analysis for physical parameters, and descriptive qualitative analysis for final appraisal of ecotourism potentials of Botutonuo Beach.

2.1. Data collection
The potential appraisal for a tourism object is carried out based on its physical parameters by quantifying the value of each parameters with its quality. The results of each parameters then combined to form a total result for physical parameters of ecotourism potentials. The parameters are made up of distance, amenities, accessibility, and attraction see Table 1.

\[
\text{PF Scoring Method} = (\text{value} \times J) + (\text{value} \times SP) + (\text{value} \times A) + (\text{value} \times DT) + (\text{value} \times KAB)
\]

Information:
- PF : Physical Parameter
- J : Distance
- SP : Amenities
- A : Attraction
- DT : Attractiveness
- KAB : Availability of Clean Water
Table 1. Tourism criteria based on physical parameters.

| No | Parameter          | Potential Value            | Very Weak (1) | Weak (2) | Moderate (3) | Strong (4) | Very Strong (5) |
|----|--------------------|----------------------------|---------------|----------|--------------|------------|-----------------|
| 1  | Distance           |                            | 60 km         | 44.01-60 km | 30.01-45 km  | 15.01-30 km | > 15 km         |
| 2  | Amenities          |                            | No amenities within the radius of 1 km | Amenities available within the radius of 1 km | There are 2 – 3 amenities available within the radius of 1 km | There are 4 types of amenities available within the radius of 1 km | There are >4 types of amenities available within the radius of 1 km |
| 3  | Accessibility      |                            | > 1000 m from the main road | 500-1000 m from the main road | < 500 m from the main road | < 500 m from the main street | < 500 m from the main avenue |
| 4  | Attractions        |                            | There are >3 similar attractions within the radius of 1 km | There are 3 similar attractions within the radius of 1 km | There are 2 similar attractions within the radius of 1 km | There is 1 similar attraction within the radius of 1 km | There is no similar attraction within the radius of 1 km |
| 5  | Availability of Clean Water | The distance between the water source and the site is >4 km | The distance between the water source and the site is > 3.1 - 4 km | The distance between the water source and the site is 2.1 – 3 km | The distance between the water source and the site is 1.1-2 km | The distance between the water source and the site is 0-1 km |

Source: [14]

The natural and cultural tourism potential assessment is based on institutional parameter, socio-cultural parameter, and economic and environment parameter. The method to determine the scoring value for PKSEL parameter is similar to those of physical parameter (PF), where each institutional parameter, social parameter, cultural parameter, and environmental parameter (PKSEL) are multiplied with the quality of the parameter, and totaled using the scoring formula listed below see Table 2.

Scoring method

$$\text{PKSEL} = (v \times P) + (\text{value} \times A) + (\text{value} \times K) + (\text{value} \times \text{PCM})$$

Notes:
- P: Management
- A: Attraction
- K: Security
- PCM: Food and Souvenir Stalls
- TR: Spatial arrangement

Table 2. Tourism criteria based on institutional, social, cultural, and environment parameter.

| No | Parameter                        | Potential Value                              | Very Weak (1) | Moderate (2) | Very Strong (3) |
|----|----------------------------------|---------------------------------------------|---------------|--------------|-----------------|
| 1  | Management (P)                   | Management unavailable                       | Management unavailable | Management available |
| 2  | Attraction (AH)                  | No tourism attraction available              | Attraction available 1 – 2 months | Attraction available > 2 months |
| 3  | Security (K)                     | Security personnel not available             | Security personnel available |
| 4  | Food and Souvenir Stall          | No food and souvenir stalls available        | 1 – 5 food and souvenir stalls available | More than 5 food and souvenir stalls available |
| 5  | Spatial Arrangement              | Not in accordance with spatial planning      | In accordance with spatial planning |

Source: [14]
2.2. Data analysis

Data analysis to assess the potential value of an ecotourism obtained through average score of physical parameters (PF) and socio-cultural, economic and environment institutional (PKSEL) combination.

\[
\text{Tourism Potential Score} = \frac{\sum PF + \sum PKSL}{2}
\]

The obtained score value of the potential then classified into class interval criteria (Walpole 1982) see Table 3.

\[
\text{Class Interval} = \frac{\max \text{score} - \min \text{score}}{\sum \text{Criteria}}.
\]

Table 3. Classification of ecotourism potential’s assessment.

| No | Total Score | Remarks         |
|----|-------------|-----------------|
| 1  | 1 - 2       | Low Potential   |
| 2  | 2.01 - 3    | Moderate Potential |
| 3  | 3.01 - 4    | High Potential  |
| 4  | 4.01 - 5    | Very High Potential |

3. Results and discussion

3.1. Geographical condition of Botutonuo Beach

Botutonuo is a coastal village in Bone Bolango Regency, which has beach tourism potential. It is located in Kabila Bone district of Bone Bolango regency. Based on the village potential data, it is noted that the village stretch in an area of ± 3100 Km² see Figure 1. It is situated in the northern hill side of Bone Bolango Regency. In the north, the border is the Suwawa district; in the south, the border is Tomini Bay; whereas in the east, the border is Bone Pantai District; and the west border is Botupingge district. Morphologically, large proportion of this village consists of hill side and low land area. Botutonuo village consists of four hamlets: Botutonuo Timur, Botutonuo Barat, Pancuran and Bunga hamlet. Below is the ecotourism map of Botutonuo beach of Bone Bolango Regency.

Figure 1. Ecotourism map of Botutonuo Beach of Bone Bolango Regency (Source: Quickbird Image SAS Planet, 2020).
3.2. Analysis of ecotourism for Botutonuo Beach

Botutonuo beach is located in Kabila Bone District of Bone Bolango regency. Beach vegetation is a vegetative group that grow in intertidal area up to the land area that still receive influence form the sea. The vegetation in Botutonuo beach area are mainly coconut trees. There are also well-preserved white sandy beach filled with sand, pebbles, and medium size stones. The strong wind and sea waves bring small particles of corals and other materials to the beach. The water in this area is very clear. Thus, it is suitable for swimming and other water activities. This beach area is also clean and the local community maintains the cleanliness in this area. Based on the analysis of physical parameters of the beach, which consists of vegetation, environmental hygiene, beach materials and water brightness, the Botutonuo beach is highly potential to be developed. The Botutonuo beach ecotourism area in Bone Bolango Regency is shown in Figure 2 below.

![Figure 2. White Sandy Beach in Botutonuo.](image)

Botutonuo beach located about 22.83 km from the capital city of Bone Bolango regency and can be reached in about 30 minutes using two and four-wheeled vehicles. The distance is measured by using the length of the road from the capital city of the regency to a tourism site in each regency. This measurement is carried out using the shortest route tool within the Quantum GIS software. This tool requires the coordinate point of the initial location and the destination measured from the capital of the regency to the coordinate point of the ecotourism site. The accessibility to this tourism site is also quite good due to the availability of the paved road. The Botutonuo beach has been managed by the local community as a tourism site since early 2000s. The local community have cooperated to build several gazebos for the tourists to sit and place their belongings. From its initial establishment in 2000 to 2002, the gazebos’ roofs were made of thatch roofs. In 2003, the local community collectively changes the roofs to tin roofs. Within the radius of one km, the available amenities are cottages, mosque, and health care center. In addition, within the area, the amenities are tire floaters, small boats for rent, and gazebos.

Based on the attraction parameter, the tourism site assessment is carried out by creating a buffer of one km for each tourism object and tourism site type within this buffer area is identified. Based on the assessment result of the ecotourism potentials of the Botutonuo beach, it is categorized as high potential due to various ecotourism activities that can be done within this site. Those activities are: swimming, boating, snorkeling, diving, fishing, and other beach sports and fun activities. The availability of clean fresh water in this area is also important for rinsing and other cleaning purposes. The clean and fresh water source is available within the radius of one km of the tourism site, thus it strongly supports the development of beach ecotourism.

Most of the tourists in Botutonuo beach are local visitors from Bone Bolango regency, Gorontalo municipality, and Gorontalo regency. They come in groups, either family groups, school groups, government institution groups, and youth groups. The assessment based on the institutional, socio-
cultural, economic, and environment parameters are strongly supportive. This is due to the natural development of this tourism site as the community themselves initiate the development of this site by building the tourism facilities to support this site attraction as well as for their source of income see Figure 3. Therefore, the management of this site tend to be collectively managed by the community. Administratively, Botutonuo beach is under the management of the Tourism and Creative Economy Department of Bone Bolango regency. Local community’s involvement in the management of this tourism attraction are mostly as merchants, parking lot management, and cottage owners. In addition to natural attraction in this area, the tourists can also enjoy the unique experience of traditional fishermen’s lives. In this area, tourists can see fishermen activities, from fishing, to selling their catch in the fish market, and enjoying the traditional culinary made of local fishermen catch. These can attract tourists to come to Botutonuo. The tourism development activities within this site is beneficial for the community in this area.

![Figure 3. Botutonuo beach and some of its amenities or gazebos.](image)

Based on the final scoring of the physical parameters and institutional, social, economic, and environmental parameters, it is revealed that the Botutonuo beach is highly potential. The community are utilizing the intact natural beauty, cultural, and historical values of the local people. The beautiful natural view, underwater site of snorkeling and diving, handicrafts, local arts, cultural tourism, culinary tourism, and the site attraction have made this site to have abundant tourism potentials to be developed. This tourism site also contributes to the income of local community. Large number of visitors will ensure higher income for local community, and in turn, will have positive impact on their livelihoods.

4. Conclusion
Botutonuo beach is a highly potential site. This is based on the physical parameters analysis of the beach: its vegetation, environmental hygiene, beach materials, and water clarity. Similar result is also obtained from the physical parameters of distance, amenities, accessibilities, and attractiveness of this site. In addition, the institutional, socio-cultural, economic, and environment parameters also yield similar result. This site is highly potential due to its natural white sandy beach. In addition, the community participation in developing the tourism facilities also serve as additional value for the development of ecotourism in Botutonuo beach. The local community utilize the intact and beautiful natural view, its culture and history without having to destroy or to sell them. The natural view potential, underwater attraction for snorkelling and diving, handicrafts, local arts, cultural tourism, culinary tourism, and recreational site have made this site to have diverse tourism resources. This potential can be developed to support the local economy and increase the welfare of the people in this area.
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