

Analysis of Ecotourism Potential Development in Pohuwato Regency, Gorontalo Province

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Abstract: - Preservation of nature and local culture and local community involvement in tourism site management and taking into consideration their needs and interests are the core values of ecotourism. Pohuwato, one of the regencies in Gorontalo province is endowed with many tourism potentials, and thus, should be mapped to increase appreciation toward local culture by cultivating the traditional values and local wisdom among the society. This study aims at mapping the local ecotourism potential in the Pohuwato Regency. Survey, interview, and Geographic Information System methods are employed in this study. Further, scoring and descriptive methods are utilized to analyse the data obtained from the field. The analysis reveals that several sites and local wisdom are the potential to be further cultivated to attract tourists to Pohuwato such as Pohon Cinta Beach, Torosiaje the Bajajunese Village, Lahe Island, and Libuo Beach. This mapping will benefit the public and government in providing information and making it easier for visitors to get to know the ecotourism sites in Pohuwato regency and assist the development of Geopark Gorontalo.

Key-Words: - Ecotourism Potential, Geographic Information System, Pohuwato Regency

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1 Introduction

Sustainable tourism development aims at providing attractions that are environmentally, legally, economically, and culturally responsible. There are various ways to ensure this sustainable tourism, one way is by utilizing the available tourism potential. One way to uncover the potential of a site is by understanding what the market/tourist wants. There are three at least three main things that attract a tourist to visit a site: its nature, culture, and the human itself. These things need to be uncovered in order to increase the visits of both local and foreign tourists. Meanwhile, there are many aspects, both its nature, and culture, that are waiting to be discovered and explored.

Further, tourism development is needed to boost equal business opportunities and obtain benefits and the ability to thrive and persevere in the fast-changing local, national, and global economy. Various modalities such as nature, culture, and the human itself can be utilized for tourism development. Culture in general, influences tourists to visit an attraction, [1], [2]. Cultural tourism inspires people by educating visitors to face the future by taking into reference the cultures provided in a tourism site. The tourism business provides an opportunity to explore the history and culture of a

site. Cultural tourism integrates various concepts of tourism study and promotes a holistic, flexible, and reflective view on tourism, [3]. Describe that selection of tourism purposes is largely influenced by the nature of the culture. Therefore, cultural tourism needs to be sustainably developed. Further argue that one of the most critical factors for the sustainability of tourism is community-based tourism development, which ultimately leads to the achievement of sustainable tourism, [4], [5].

Ecotourism has been on a new raise as opposed to the massive tourism both nationally and internationally. It has become a new alternative for tourists who travel not only to enjoy nature but also to conserve the existence of tourist attractions for sustainable use. It is widely known that ecotourism is a leisure travel to natural attractions intended to conserve the environment and life as well as to preserve the livelihood of the local community, [6], [7], [8], [9]. Ideally, ecotourism has to meet several criteria such as the conservation of biodiversity and culture through protection of the ecosystem and promoting the sustainable usage of biodiversity with minimum impact to the environment, [10]. Ecotourism is also said to be the most precious form of sustainable tourism development, [11]. It actively provides solutions for problems that may arise due

to tourism site development. According to [12], noted that ecotourism offers a holistic value of tourism that balances the beauty of enjoying nature with the efforts to preserve it. It ensures ecologically friendly development that based on community, prevents and overcomes the impact of tourists' activities toward nature and culture; its prevention and solution is based on the nature and characters of the environment and the local culture, [6]. Ecotourism development benefits the community, economy, and environment, [13], appropriate utilization of natural resources, [14], and has a direct impact on the local community, [15].

Meanwhile, Pohuwato Regency has plenty of natural endowments such as its unique beaches and coastal area, and its diverse and beautiful culture. It is also complemented by its terrestrial resources and rich biodiversity to potentially attract more visitors to this place and increase the welfare of its people. Pohuwato is also given an advantage in its morphological and geological condition, through its distribution of limestones and geological structure, [16], [17], [18], [19], [20]. This has made Pohuwato a unique site for studying its ecotourism potential and identifying its local wisdom values. These are critical for sustainable tourism development. In addition, local wisdom-based tourism is one of the core values for sustainable tourism development and community participation in sustainable tourism infrastructure and facilities development, [21]. A well-developed tourism object, which signifies the influx of visitors and an increase of income generated from this tourism object will ultimately bring positive advantages for the economic development of the community, and in turn, will lead to the increase of welfare and improvement of life quality of the local people, [22]. Thus, it is important to map the Pohuwato Regency's potential to increase community participation toward local culture and local wisdom as well as increase their appreciation toward nature through the increase of businesses near the tourist destinations.

Current tourism businesses in Pohuwato Regency are very limited, therefore, there is a need to develop tourism by taking into consideration the interest in nature. Tourism development in Pohuwato Regency needs to be developed into an ecotourism area to cultivate the local wisdom and growth approach as well as economic equality for people's livelihood and sustainable development. Tourism development in Pohuwato should be people's centered and empowering. Tourism potential concentrated in several areas in Pohuwato needs to be followed by the strengthening of

equality and driven by community participation. It also needs to be spread into other areas in Pohuwato that have unique natural and cultural advantages. Hence, this article aims at mapping the tourism potential in the Pohuwato Regency.

2 Methodology

Field survey, interview, and Geographic Information System (GIS) methods are employed to collect the data in this study. The result of the survey are analyzed using descriptive statistics, whereas scoring analysis is used on physical parameters, and qualitative descriptive is used in the final measurement of ecotourism potential in Pohuwato regency. The physical parameter in this study is distance, facilities, attraction, and availability of clean water. Meanwhile, the socio-economic and environmental institution parameter in this study comprises of management, attraction, security, food and souvenir stall, and spatial planning.

Table 1. Tourism criteria based on the physical parameter

| No | Parameter | Potential Criteria | | | | |
|----|-------------------------------|--|---|---|---|--|
| | | Weakest (1) | Weak (2) | Moderate (3) | Strong (4) | Strongest (5) |
| 1 | Distance | > 60 km | 44,01- 60 km | 30,01- 45 km | 15,01-30 km | > 15 km |
| 2 | Facilities and Infrastructure | There is no FI within 1 km | There are Facilities & Infrastructure within a 1 km radius | There are 2-3 types of FI within the 1 km radius | There are 4 types of FI within a 1 km radius | There are more than 4 types of FI within a 1 km radius |
| 3 | Accessibility | > 1000 m from the district road | 500- 1000 m from the district road | < 500 m from the district road | < 500 m from provincial road | < 500 m from national road |
| 4 | Attraction | There are > 3 similar objects within a 1 km radius | There are 3 similar objects within a 1 km radius | There are 2 similar objects within a 1 km radius | There is 1 similar object within a 1 km radius | There are no similar objects within a 1 km radius |
| 5 | Clean water availability | The clean water source is > 4 km from the site | The clean water source is within 3.1 km to 4 km of the site | The clean water source is within 2.1 – 3 km of the site | The clean water source is located between 1.1 to 2 km from the site | The clean water source is located between 0 – 1 km from the site |

Source: (Modification of [22])

2.1 Data Collection

The potential value of a tourism object based on the physical parameter is obtained by: multiplying the value of each parameter with the score weight of a parameter. The results of the score were then combined among those physical parameter values, the distance, the facilities and infrastructure, accessibility, and attraction (Table 1). Scoring method for **Physical Parameter (PF) = (Score x J) + (Score x SP) + (Score x A) + (Score x DT) + (Score x KAB)**

Notes:

- PF : Physical Parameter
- J : Distance
- SP : Facilities and Infrastructure
- A : Accessibility
- DT : Attraction
- KAB : Availability of Clean Water

Criteria for measuring natural tourism and cultural potential are based on institutional parameters, socio-cultural, economic, and environmental parameters. The scoring of the PKSEL is similar to the scoring on Physical Parameters (Table 2). It is formulated as follows:

Scoring Method: **PKSEL = (Score × P) + (Score × A) + (Score × K) + (Score × PCM)**

Notes:

- P : Management
- A : Arts and Entertainment Attraction
- K : Security
- PCM : Souvenir and Food Selling
- TR : Spatial planning

Institutional, social, economic, and environmental parameters consist of 5 indicators, namely management, arts/entertainment attractions, security, sales of souvenirs, food and beverages, and spatial planning.

Management is one of the determinants of the development of a tourism object from that object. Having a manager will provide an added value to the tourism object, which will indirectly have a positive effect on the preservation of the object by maintaining the assets in the tourist object and visitors can maximize the utilization of existing assets according to their function.

Table 2. Tourism criteria based on institution, social, cultural, and environmental parameters

| No | Parameter | Potential Score | | |
|----|--|-------------------------------------|--|--|
| | | Weak (1) | Moderate (2) | Strong (3) |
| 1 | Management (P) | No tourism Management exist | | Tourism management exist |
| 2 | Arts and entertainment attraction (AH) | No entertainment attraction | Entertainment attractions held once to twice a month | Entertainment attractions held more than twice a month |
| 3 | Security (K) | No security officer | | Security officer exist |
| 4 | Food and souvenir shop | No food and souvenir shop available | 1 – 5 food and souvenir shops available | More than 5 food and souvenir shops are available |
| 5 | Lay out/spatial | Not in-line with spatial planning | | In-line with spatial planning |

Source: (Modification of [22])

Arts and entertainment attraction, Art is the main attraction of a tourist attraction. The assessment of the parameters of attractions, entertainment, and arts for tourism objects is based on how often attractions, entertainment, and arts are carried out in tourist objects. Security is a major factor for tourists in making tourist visits. The safety factor is the main key to increasing the number of tourists. Souvenirs and food selling, food and drinks are one of the characteristics of a tourist attraction, where the sale of food and drinks is highly expected for visitors. Assessment of tourist objects with this parameter emphasizes more on the quantity or number of places selling souvenirs, food, and drinks in a tourist attraction. Spatial planning is the suitability of cultural tourism objects with the allocation of space utilization on provincial and district/city spatial maps.

Table 3. Physical parameters

| No | Physical Parameter | Score |
|----|-------------------------------|-------|
| 1 | Distance | 0.2 |
| 2 | Facilities and Infrastructure | 0.2 |
| 3 | Accessibility | 0.2 |
| 4 | Attraction | 0.3 |
| 5 | Clean Water Availability | 0.1 |
| | Total | 1 |

Table 4. Institutional, social, economic, and environmental parameters

| No | Institutional, Social, Economic, and Environment Parameters | Score |
|----|---|-------|
| 1 | Management | 0.3 |
| 2 | Attraction | 0.2 |
| 3 | Security | 0.2 |
| 4 | Food and Souvenir Shop | 0.2 |
| 5 | Spatial planning /Spatial | 0.1 |
| | Total | 1 |

The scoring for each parameter is different, the weight for attraction and management is 0.3 as these are the main factors that made a person decide to implement tourism activity. Meanwhile, distance, accessibility, attraction, food and souvenir shop, and security are 0.2, as those are important factors to support people to select a tourism destination. In addition, accommodation and facilities and infrastructure also scored 0.2 as these two are supporting factors in tourism activity. Further, clean water availability and spatial planning/spatial is given a score of 0.1. The scoring for each parameter is presented in Table 3 and Table 4 below.

2.2 Data Analysis

The score of each tourism site's potential was calculated by the average of the total score of both physical and Institution, Sociocultural, Economy, and Environmental parameters (PKSEL).

The scoring formula for tourism potential $\frac{\sum PF + \sum PKSL}{2}$

The score obtained from this formula is then classified into the class interval (Table 5) determined using the formula, [23].

Class interval = $\frac{\sum Maximum\ score - \sum Minimum\ Score}{\sum Criteria}$

Table 5. Classification of tourism potential assessment

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

3 Result and Discussion

3.1 Ecotourism Mapping Potential for Pohuwato Regency

Pohuwato Regency has a population of 140.858 people and is located between 00° 22' – 00° 57' N and 121° 23' – 122° 19' E (Figure 1). In regards to its typology, the Pohuwato coastline is stretched for 160 km² that covers an area of 3,300 ha. Most of the Pohuwato regency area is a lowland hill with several prairies and highlands. This physical condition of the area made 55% of its population work as farmers, 35% as fishermen, and the rest work as government employees and others. The residential areas are mostly scattered along the trans Sulawesi highway and the land outside this residential area is yet occupied. Several tourist objects in this regency are the potential to be further developed as ecotourism sites such as Pohon Cinta Beach, Lahe Island, Torosiaje the sea nomad village, and Libuo Beach. The ecotourism map for the Pohuwato Regency is shown below.

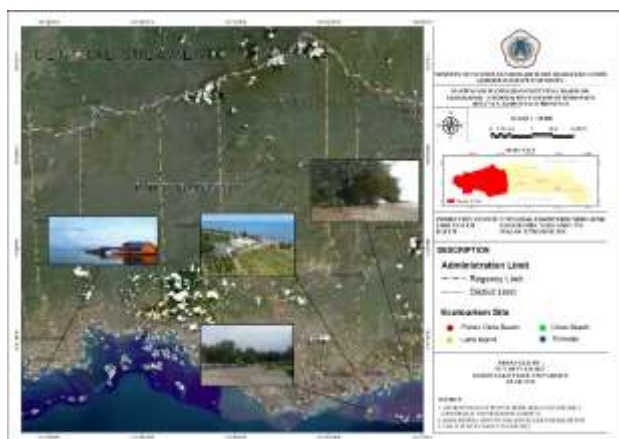


Fig. 1: Ecotourism Sites of Pohuwato Regency

3.2 Scoring of Ecotourism Potential for Pohuwato Regency

The calculation of the distance of several tourism objects based on the distance classification mostly resulted in high potential as the locations are near the capital of the regency. Those sites with high scores for distance parameters are Pohon Cinta Beach 4 km from the district capital, Lahe Island 5.5 km, and Libuo Beach 14 km from the capital of the district. The calculation of distance and number of tourism objects based on the distance parameter is shown in Table 6 below.

Table 6. Distance measurement of the tourism objects in Pohuwato Regency

| Tourism Object | Distance from the District Capital to the Site | Score |
|----------------|--|--------------------|
| 1 | 1 - 2 | Low Potential |
| 2 | 2.01 - 3 | Moderate Potential |
| 3 | 3.01 - 4 | High Potential |
| 4 | 4.01 - 5 | Highest Potential |

Table 7. Results of facilities and infrastructure measurement for four tourism objects in Pohuwato Regency

| Tourism Object | Score | Potential Score |
|-------------------|-------|-----------------|
| Pohon Cinta Beach | 5 | 1 |
| Lahe Island | 4 | 0.8 |
| Torosiaje | 5 | 1 |
| Libuo Beach | 4 | 0.8 |

Further facilities and infrastructure identified within a 1 km radius of these sites are hotel/lodging, health care facilities (health care center and hospital), police officers, restaurants and food shops, praying facilities, banks/ATMs, markets, and bus stations. Torosiaje and Pantai Pohon Cinta Beach turned out to have the highest potential based on the availability of facilities and infrastructure within a radius of 1 km from the site. In detail, the measurement based on the availability of the facilities and infrastructure for four sites is presented in the following Table 7.

In addition, for the accessibility parameter, Pohon Cinta Beach and Libuo Beach turned out to have the highest accessibility as it is within a 1 km radius of the district road. The road classification is classified into national road, provincial road, and district/regency road.

Table 8. Attraction parameter measurement for each ecotourism site

| Tourism Object | Score | Potential Score |
|-------------------|-------|-----------------|
| Pohon Cinta Beach | 5 | 1.5 |
| Lahe Island | 5 | 1.5 |
| Torosiaje | 5 | 1.5 |
| Libuo Beach | 3 | 0.9 |

Table 9. Physical parameters assessment results

| Parameter | Pohon Cinta Beach | Lahe Island | Torosiaje | Libuo Beach |
|-----------------------------|-------------------|-------------|-----------|-------------|
| Distance | 5 | 4 | 1 | 3 |
| Facilities & Infrastructure | 5 | 4 | 5 | 1 |
| Accessibility | 5 | 4 | 4 | 3 |
| Attraction | 5 | 5 | 5 | 2 |
| Clean Water Availability | 5 | 5 | 5 | 3 |

Next, the attraction parameter is classified by creating a 1 km buffer in each site and by identifying the types of tourism objects within that buffer area. The results showed that Lahe Island and Torosiaje have the high score. The detailed measurement of all the sites based on attraction in each site is presented in the following Table 8.

Similarly, the availability of clean water in an ecotourism object is critical for people to visit this site. The clean water availability parameter is measured by comparing the site and the distance toward the source of clean water. If the clean water source is located within 1 km of the ecotourism site, then it means that the site is high potential and so on. The results of this study revealed that all sites have high potential due to the availability of clean water sources within 1 km of each of the tourism sites. In summary, the physical parameters measurement for all sites is presented in Table 9 below.

1. Pohon Cinta Beach

$$\begin{aligned}
 &= (\text{Score} \times J) + (\text{Score} \times SP) + (\text{Score} \times A) + \\
 &(\text{Score} \times DT) + (\text{Score} \times KAB) \\
 &= (0.2 \times 5) + (0.2 \times 5) + (0.2 \times 5) + (0.3 \times 5) + \\
 &(0.1 \times 5) \\
 &= 1.2 + 1 + 1 + 1.5 + 0.5 \\
 &= 5.2
 \end{aligned}$$

2. Lahe Island

$$\begin{aligned}
 &= (\text{Score} \times J) + (\text{Score} \times SP) + (\text{Score} \times A) + \\
 &(\text{Score} \times DT) + (\text{Score} \times KAB) \\
 &= (0.2 \times 4) + (0.2 \times 4) + (0.2 \times 4) + (0.3 \times 5) + \\
 &(0.1 \times 5) \\
 &= 0.8 + 0.8 + 0.8 + 1.5 + 0.5 \\
 &= 4.4
 \end{aligned}$$

3. Torosiaje

$$\begin{aligned}
 &= (\text{Score} \times J) + (\text{Score} \times SP) + (\text{Score} \times A) + \\
 &(\text{Score} \times DT) + (\text{Score} \times KAB) \\
 &= (0.2 \times 1) + (0.2 \times 5) + (0.2 \times 4) + (0.3 \times 5) + \\
 &(0.1 \times 5) \\
 &= 0.2 + 1 + 1 + 1.5 + 0.5 \\
 &= 4.2
 \end{aligned}$$

4. Libuo Beach

$$\begin{aligned}
 &= (\text{Score} \times J) + (\text{Score} \times SP) + (\text{Score} \times A) + \\
 &(\text{Score} \times DT) + (\text{Score} \times KAB) \\
 &= (0.2 \times 5) + (0.2 \times 4) + (0.2 \times 4) + (0.3 \times 4) + \\
 &(0.1 \times 5) \\
 &= 1 + 0.8 + 0.8 + 1.2 + 0.5 \\
 &= 4.3
 \end{aligned}$$

On the other hand, based on the institution, socio-cultural, economic, and environmental parameters, the tourism potential for natural and cultural tourism is calculated similarly to those of physical parameters. The detailed assessment of these non-physical parameters is presented in Table 10 below.

1. Pohon Cinta Beach

$$\begin{aligned}
 &= (\text{Score} \times P) + (\text{Score} \times AH) + (\text{Score} \times K) + \\
 &(\text{Score} \times PCM) + (\text{Score} \times TR) \\
 &= (0.3 \times 3) + (0.2 \times 2) + (0.2 \times 2) + (0.2 \times 3) + \\
 &(0.1 \times 3) \\
 &= 0.9 + 0.4 + 0.4 + 0.6 + 0.3 \\
 &= 2.6
 \end{aligned}$$

2. Lahe Island

$$\begin{aligned}
 &= (\text{Score} \times P) + (\text{Score} \times A) + (\text{Score} \times K) + \\
 &(\text{Score} \times PCM) + (\text{Score} \times TR) \\
 &= (0.3 \times 3) + (0.2 \times 2) + (0.2 \times 2) + (0.2 \times 3) + \\
 &(0.1 \times 3) \\
 &= 0.9 + 0.4 + 0.4 + 0.6 + 0.3 \\
 &= 2.6
 \end{aligned}$$

3. Torosiaje

$$\begin{aligned}
 &= (\text{Score} \times P) + (\text{Score} \times A) + (\text{Score} \times K) + \\
 &(\text{Score} \times PCM) + (\text{Score} \times TR) \\
 &= (0.3 \times 3) + (0.2 \times 3) + (0.2 \times 3) + (0.2 \times 3) + \\
 &(0.1 \times 3) \\
 &= 0.9 + 0.6 + 0.6 + 0.6 + 0.3 \\
 &= 3
 \end{aligned}$$

4. Libuo Beach

$$\begin{aligned}
 &= (\text{Score} \times P) + (\text{Score} \times A) + (\text{Score} \times K) + \\
 &(\text{Score} \times PCM) + (\text{Score} \times TR) \\
 &= (0.3 \times 3) + (0.2 \times 1) + (0.2 \times 3) + (0.2 \times 2) + \\
 &(0.1 \times 3) \\
 &= 0.9 + 0.2 + 0.6 + 0.4 + 0.3 \\
 &= 2.4
 \end{aligned}$$

Table 10. PKSEL parameters assessment

| Parameter | Pohon Cinta Beach | Lahe Island | Torosiaje | Libuo Beach |
|--|-------------------|-------------|-----------|-------------|
| Management (P) | 3 | 3 | 3 | 3 |
| Arts and Entertainment Attraction (AH) | 2 | 2 | 3 | 1 |
| Security (K) | 2 | 2 | 3 | 3 |
| Food and Souvenir Shop (PCM) | 2 | 3 | 3 | 2 |
| Spatial planning / Spatial (TR) | 2 | 3 | 3 | 3 |

Table 11. Classification of ecotourism potential in Pohuwato Regency

| Tourism Object | Final Score | Potential |
|-------------------|-------------|-----------|
| Pohon Cinta Beach | 3.90 | High |
| Lahe Island | 3.60 | High |
| Torosiaje | 3.50 | High |
| Libuo Beach | 3.35 | High |

The combination of both the physical parameter score and non-physical parameter score for the ecotourism site in Pohuwato Regency produced the final score and final potential score, which are described in Table 11 below.

Table 11 Classification of Tourism potential based on the final score of all the combinations between physical parameters and social institutional economy and environmental parameters which later divided into two. The results show that all ecotourism sites identified in this study have high potential. Those sites are Pohon Cinta Beach, Torosiaje, Pulau Lahe and Libuo Beach.

3.3 Pohuwato Regency Ecotourism Potential Analysis

The measurement of the ecotourism potential in the Pohuwato Regency is discussed as follows:

3.3.1 Pohon Cinta Beach

Pohon Cinta beach is located in Pohuwato Timur village of Marisa sub-district, Pohuwato regency, and the coordinate location is N 00.44971° E 121.94818°. The Pohon Cinta ecotourism site is the first destination in this district with its Maleo bird icon. The mangrove site is one of the attractions that can be found in this area. There is a walking path created to enjoy this mangrove site. Its mangrove vegetation and the fauna that can be found within this mangrove forest are among the attraction of this

site. A polygon of 1 km is created to identify the tourist attractions within this 1 km buffer area of each of the sites.

It reveals that Pohon Cinta Beach also has several other attractions such as swimming and fishing activities, and enjoying the scenery along the beach. Pohon Cinta Beach is located 1 km from the capital city of the district and can be reached within five minutes by land transport. This measurement is calculated using the shortest pathway tool in Quantum GIS software. Access toward this Pohon Cinta beach is very easy as it has a wide and smooth access road. The accessibility and facility on this site are based on comfortability with a global standard for its users.



Fig. 2:- Pohon Cinta ecotourism beach

Based on the facilities and infrastructure assessment, the Pohon Cinta beach ecotourism site has high potential due to its sufficient facilities and infrastructure. There are hotels near the site and within Marisa City (the capital city of Pohuwato Regency). There are also information centers, health care centers, firefighter offices, and beauty care centers. This site is also located near the shops and banks.

The healthcare facilities near these sites are health clinics and hospitals. This ecotourism site is also near the Grand Mosque and has three other praying facilities, and an iconic prostrating mosque is in its vicinity. Pohon Cinta site also has a sports facility, mini football field, and volleyball field, as well as a sepak takraw field. Clean water availability, as well as trash cans, and poster prohibiting people to throw their garbage in the site also supports the cleanliness of this site. The Pohon Cinta site is portrayed in Figure 2 below.

The socio-cultural parameter also provided a high score due to the Tulude ritual performed on this site. This ritual is an annual rite performed by the Sangihe tribe in the Pohuwato regency and has been performed since the early establishment of this regency back in 2003. Tulude ritual is a ritual

offered to Mawu Ruata Ghenggona Langi (God), as the expression of the Sangihe ethnic gratitude to God for all the blessings given in the previous year. The word *Tulude* is derived from the word “*suhude*” in the Sangihe language, which means pushing or refuting. It culturally means that the Sangihe tribe refused to hold on to the past and that they are ready to face the future. This *Tulude* ritual is a local wisdom that could attract tourists to visit Pohon Cinta Beach.

Meanwhile, in our interview with the local community, they revealed that the tourism activity is largely dependent on the government agency, the tourism agency of Pohuwato. This was due to the limited availability of the tourism industry that exists in this area. Our respondents also disclosed that the security of this site is guaranteed by the local community. On the spatial planning aspect, the literature revealed that based on the local regulation of Pohuwato Regency of 212 on Pohuwato Spatial Planning, this destination is in line with the spatial planning regulation of Pohuwato Regency.

3.3.2 Lahe Island

Lahe is a small island located in front of Pohon Cinta Beach within the Tomini Bay area. Its location coordinate is N 00.41719°E 121.95405°. This island is known for its beautiful sandy beach that surrounded the island and its great underwater view.

This potential is yet developed and very little information is provided on this island. However, the government of Pohuwato has started to collect data on this island and since then, it has attracted many divers that used to visit other sites in Central Sulawesi (Togean). Its healthy coral and diverse types of coral as well as its inhabitants are a good attraction for the visitors. As this island is close to Pohon Cinta Beach, thus, visitors often visit both sites. This island is only accessible by boat for about 30 minutes from the beach of Pohon Cinta. The visitors can rent boats that are largely available on the coast of Pohon Cinta. Visitors of this island enjoy its underwater view. The local government also purposefully sunk the old vehicles to create the homes for the underwater biota in this location.

Lahe Island has many visitors from abroad due to their transit trip to Togean Island in Central Sulawesi. In addition, some of them also like to explore new areas such as this Lahe Island and some other islands in Pohuwato. The picture of Lahe Island is attached in Figure 3 below.

Based on its physical parameters, Lahe island has good vegetation as it is surrounded by tall pine trees, its environment is really clean, and the visibility

under the water is also clear. Thus, this island is highly potential to be further developed as thematic tourism as an ecotourism site.



Fig. 3: Aerial view of Lahe Island and its surrounding white sandy beach

3.3.3 Torosiaje the Bajau Village

Torosiaje is one of the priority destinations in Gorontalo as it has much uniqueness. The Bajau/the sea nomad resides in this village. It is part of the Popayato sub-district in the Pohuwato regency. It is located in N 00.47441° E 121.43831° Torosiaje or Kampung Bajo, is located on the water in the Tomini Bay about 600 meters from the mainland. In this village, 389 families reside and most of them are fishermen. Their houses are built on the sea and each house is connected with a wood plank that creates a path surrounding the village. This path stretches for about 2.2 km. The village is accessible by boat only and the access is provided by the local community using the traditional Bajau boat. To reach the boat, the visitors only need to walk from the parking lot, through the concrete path created in the mangrove forest toward the jetty.

Despite its remote location, the facilities and infrastructure in this site have high potential. This site has a badminton field a sports field and educational facilities as well as a praying facility. It is also equipped with several hostels. One of the hostels belongs to the government. There are also several homestays in this village. A healthcare facility is also available in this village. Thus, both villagers and visitors can utilize this facility.

Affordable and good sea-culinary varieties are a great attraction for visitors. There are also shops for toiletries and amenities for visitors. In addition, there are also souvenir galleries as well as cultural galleries available in this village.

As it is mentioned above, visitors will be entertained with a mangrove forest view before entering this village. Many activities can be done by the visitors in this village such as diving, fishing, enjoying the sunset and sunrise, and snorkeling.

Visitors can also enjoy the nearby spots by boat. Some can even interact with the black and white tip shark, green turtle, school of fish, and beautiful coral reefs.

The security of the village is located at the entrance before the jetty, thus, local and visitors' safety are protected. However, waste management is still a problem, as the increase in population and visitors implies an increase in garbage and waste produced in this village. Hence, the village government has prepared trash bins. Nevertheless, sustainable waste management still is an issue that needs to be addressed in the development of the ecotourism village in Torosiaje. Torosiaje Ecotourism site is shown in Figure 4 below.



Fig. 4: Torosiaje Village

Torosiaje village has multiethnicity; the Bajau, the Chinese, the Javanese, the Buginese, and Gorontaloese. Each of this ethnicity proudly shows its culture through symbols and values. Similarly, the cuisine of each ethnicity is also showcased to strengthen their identities. Such diversity is not only attractive for people of similar cultures, but also for those of other cultures. This diversity has produced its sociocultural attractiveness and its local wisdom. Tourism is managed by the village, as such, the visitors can fully experience the local culture.

3.3.4 Libuo Beach

Pantai Libuo is located in the buffer zone of Panua Natural Reserve. It is located in the N 00.46817⁰E 122.01659⁰. Administratively, this beach belongs to the Puspia or Bunga Village of the Paguat sub-district of Pohuwato Regency, Gorontalo Province. Libuo has a beautiful sandy beach, thus, suitable for family activity. The distance from the capital of the district (Marisa City) is only about 15 km.

Similar to Lahe Island, this beach also has many evergreen trees or *Wohu* trees in the local language. These trees provide shade for visitors. This beach is easily accessible by land vehicles and about 30 minutes from the capital of the district. Its ease of

access made this tourism object a suitable choice for tourists. The site provides cottages for those who want to stay overnight. Other facilities such as a secure parking lot and clean water and bathing facilities are also available on this site. This beach can also accommodate large events as it has an open meeting hall. One of the cottages is shown in Figure 5 below.

Food stalls are also available in Libuo Beach. Generally, people only come to swim in the sea. However, during the weekend visitors will come and enjoy other activities such as playing beach volleyball in Libuo as well as other family activities. Several activities that can be done in Libuo Beach are swimming, snorkeling, mangrove tracking, and sea culinary.



Fig. 5: Lodging at Libuo Ecotourism Beach

The security checkpoint on this beach is also available. In addition, there are also cleaning services to ensure the cleanliness of this tourist site. This cleanliness factor is one of the factors that encourages repeat visits from tourists. The availability of garbage bins in several spots in this area also convenient for tourists to maintain the tidiness of the area. A small mosque with clean water for prayers is also provided in the area. Further, there is also a decent playing field for visitors to exercise and play sports.

The local community's hospitality is a bonus to enhance the visitor's pleasant experience when visiting Libuo Beach. The local people treat tourists hospitably and in a friendly manner. This condition reflects the readiness of the local people within the Libuo beachside to further develop this tourism object as an ecotourism site by preserving their local culture and wisdom.

4 Conclusion

This study has revealed that several tourism sites mapped in this study are potential ecotourism sites. These sites have both natural tourism potential and local wisdom that can be further developed into eco-

tourism sites. Among others, the potential sites for ecotourism are Pohon Cinta Beach, Lahe Island, Torosiaje the Bajau Village, and Libuo Beach. Pohon Cinta beach is considered to have high potential not only due to its strong physical parameters but also due to its high socio-cultural parameter, where the *Tulude* ritual, a Sangihene ethnic's ritual, has always been held here. Meanwhile, Lahe island is unique due to its beautiful and diverse underwater view, and also the local government has tried to preserve this underwater scenery by sinking the old vehicles as homes for the fish and corals or often called FADs. FADs are a type of fishing aid installed in the sea, both shallow seas and deep seas. The installation is intended to attract schools of fish to gather around FADs so that fish are easy to catch. FADs in marine language are artificial reefs made by humans to be a gathering place for fish. FADs are artificial houses for fish on the seabed which are made intentionally by placing various types of goods on the seabed such as old used vehicles, tires, branches, and twigs along with trees. These items are loaded with ballast in the form of concrete, stones, and other ballast so that the position of FADs does not move due to ocean currents. Goods that are put into the sea can continue to be added continuously to increase the mass of FADs. Further, the Torosiaje village has its uniqueness where the sociocultural and local wisdom of the Bajaus as the sea nomads are preserved. This village is also unique due to its location above the sea. Village government plays an important role in the management of tourism in Torosiaje, hence, the visitors immerse themselves in the local culture uniqueness while enjoying the scenery and other attractions offered in this area. Lastly, the Libuo beach is popular for its local people's hospitality. This condition enshrines the local people's readiness to involve themselves in the development of Libuo Beach as an ecotourism site. Due to this mapping of both physical and non-physical parameters (sociocultural, institutions, economic, and environmental) in Pohuwato regency, it would be beneficial information for the local government to develop these sites mention in this study as ecotourism sites. This study can also serve as the foundation for further study to support the establishment of Geopark Gorontalo.

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Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

The authors equally contributed in the present research, at all stages from the formulation of the problem to the final findings and solution.

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Conflict of Interest

The authors have no conflict of interest to declare.

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