The potential attractiveness of development mangrove ecotourism in Karawang regency

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Abstract. The mangrove ecosystem is one of the ecosystems that are very important for the life of flora, fauna as well as the people around it. The development of mangrove ecosystems into ecotourism is one way to the sustainability of mangrove ecosystems so that have a negative impact on the lives of their creatures. The development of ecotourism needs to be supported by tourist attractiveness as well as learning to tourists to care about their environment in accordance with the principles of ecotourism namely responsible travel to natural areas, conserving the environment and improving the well-being of local people. This paper focuses on the potential attractiveness of ecotourism development in Karawang Regency. The method used in this research is to do calculations using weights and scoring. The results showed that Sukakerta Village has a potential attractive attraction for mangrove ecotourism development in Karawang Regency, while Rawagempol Kulon and Tambaksari Village have an unattractive potential for mangrove ecotourism development and other villages have the attractive potential for mangrove ecotourism development due to inadequate facilities and accessibility.

1. Introduction
The mangrove ecosystem is one of the ecosystems in the coastal area which is dominated by typical tree or shrub species that can grow in salty/brackish waters and are affected by the tides of seawater [1]. The mangrove ecosystem has the potential to develop mangrove ecotourism. Mangroves that are used for ecotourism are in accordance with the shift in tourist interest from old tourism, namely tourists who only come to do tours without any elements of education and conserve action to new tourism, namely tourists who come to do tourism activities and there are elements of education and conservation in it [2].

Ecotourism is nature-based tourism involving education and interpretation of the natural environment and includes local cultural components [3]. Mangrove ecotourism development is an effort to utilize environmental services in coastal areas in a sustainable and long-term manner. Mangrove ecotourism is considered to be able to conserve forest ecosystems in a real way [4]. Karawang Regency is one of the districts in West Java that has mangrove forests with an area of 275 ha [5]. The greatest potential of mangrove forests in Karawang Regency is in Tirtajaya, Cibuaya, Cilebar and Cilamaya Districts, while in other sub-districts, it is only local, with only a few trees left, because mangroves are more suitable to grow on mud sandy soil.

In the development of a tourist destination, the important thing is interesting attractiveness because attractiveness is the key to tourism growth. An ecotourism area may attract many visitors because it offers products and services that meet visitor’s need. There are some key factors of attractiveness that
are accessibility, amenities, and infrastructure, having the potential to encourage people to visit and spend time at destination [6]. Meanwhile, stated that factors that constitute an attractive destination have mainly centered on a destination’s accessibility, amenities and infrastructure [7]. This paper focuses on the potential attractiveness of ecotourism development in Karawang Regency with indicators of primary facilities, secondary facilities, conditional facilities, and accessibility.

2. Methods

2.1 Study area
The area studied in this study is a coastal village which has a large potential of mangrove forest. Based on data on the potential of mangrove forests that are widely spread across 8 villages in 5 sub-districts, namely Tambaksari Village in Tirtajaya District, Sedari Village is in Cibuaya District, Pusakajaya Utara Village is in Cilebar District, Sukajaya Village is in Cilamaya Kulon District and District Cilamaya Wetan has the villages of Sukakerta, Rawagempol Kulon, Muara Baru and Muara. The choice of this area is because it has a large mangrove forest, which has not been optimally developed, it is known because the available facilities are not yet complete to become a tourist spot and many people have not been involved in its development.

2.2 Data processing
The assessment indicators are based on the Guidelines for Assessment of Natural Tourism Attraction of Directorate General of Forest Protection and Nature Conservation (PHKA) 2003 [8]. The number of values for an assessment criterion can be calculated with the following equation:

\[ S = N \times B \]

Information :
- \( S \): score/value of a criterion
- \( N \): number of values of indicators in criterion
- \( B \): value of weight

The criteria of primary facilities were given a weight of 6 because primary facilities or attractiveness is the main factor why a person travels. Accessibility because it is an important factor supporting tourists to do tourism activities. Meanwhile, secondary facilities and conditional facilities were given a weight of 3 as supporting matters in tourism activities. Based on Guidelines for Assessment of Natural Tourism Attraction of Directorate General of Forest Protection and Nature Conservation (PHKA) 2003, each of the highest and lowest values in every criterion is added up and multiplied by the weight value of each criterion. Then the highest number of values was deducted by the lowest number of values then divided by 3 to determine the final score categorize very attractive (1291-1710), attractive (871-1290), and unattractive (450-870).

2.3 Data analysis
The analysis used in this research is descriptive spatial analysis. Spatial analysis is used to describe the differences and similarities potential of attraction development of mangrove ecotourism using the help of maps. Descriptive analysis to explain related results in the field.

3. Result and discussions

3.1 Primary facilities
Primary facilities or tourist attractions are tourist objects that can stimulate the presence of tourists to a tourist destination [9]. Based on the results of the field survey, there are various site attractions, some are natural, and some are man-made. In addition to site attraction which is the main attraction, there are tourist attractions in the form of cultural activities called event attraction.

Based on the results of the interview, the customs in each village have in common, namely the so-called Nadran culture. The culture of "Nadran" is a ritual at sea which is carried out by all people in the...
coastal areas of Karawang Regency as a form of gratitude for the blessings that have been given. For more details about site attraction and event attraction, see Table 1.

### Table 1. Primary facilities of mangrove areas in karawang regency each village

| No. | Village         | Site Attraction                                         | Event Attraction       |
|-----|-----------------|---------------------------------------------------------|------------------------|
| 1.  | Tambaksari      | Mangrove plants, biota objects, beach                   |                        |
| 2.  | Sedari          | Mangrove plants, biota objects, tracking, water duck bike, photo spot dan huts |                        |
| 3.  | Pusakajaya Utara| Mangrove plants, biota objects, tracking, planting mangrove seeds |                        |
| 4.  | Sukajaya        | Mangrove plants, biota objects, tracking, saung, a place to store seeds | Culture Nadran         |
| 5.  | Sukakerta       | Mangrove plants, biota objects, tracking, huts, photo spot |                        |
| 6.  | Rawagempol Kulon| Mangrove plants, biota objects                          |                        |
| 7.  | Muara Baru      | Mangrove plants, biota objects                          |                        |
| 8.  | Muara           | Mangrove plants, biota objects                          |                        |

3.2 **Secondary facilities**

In developing ecotourism, secondary facilities are needed for tourists. Secondary facilities in this study include food stalls, homestay, and souvenir shops. Based on the results of field observations, the available secondary facilities are still incomplete, like tourist attractions in general. Secondary facilities in the form of the homestay are located in Sukakerta Village. Secondary facilities in the form of food stalls are found in all villages and mostly in Sukakerta Village. The completeness of secondary facilities can be seen in Table 2 and figure 1.

### Table 2. Secondary facilities of mangrove areas in karawang regency each village

| No | Village     | Homestay | Food Stalls | Souvenir Shop |
|----|-------------|----------|-------------|---------------|
| 1. | Tambaksari  | -        | 5           | -             |
| 2. | Sedari      | -        | 10          | -             |
| 3. | Pusakajaya Utara | -   | 12          | 1             |
| 4. | Sukajaya    | -        | 18          | 1             |
| 5. | Sukakerta   | 1        | 25          | 8             |
| 6. | Rawagempol Kulon | - | 2          | 1             |
| 7. | Muara Baru  | -        | 9           | -             |
| 8. | Muara       | -        | 8           | -             |
Figure 1. Map of distribution secondary facilities each village

3.3 Conditional facilities
Conditional facilities are facilities that can be used by tourists and local communities. The conditional facilities consist of toilets, parking places, and places of worship. The conditional facilities for each village that contain mangroves are still incomplete. This is because there are still villages where there are no conditional facilities in the form of public toilets and parking lots, but conditional facilities for places of worship exist in all villages like mosques and mushola. The completeness of conditional facilities can be seen in table 3 and figure 2.

Table 3. Conditional facilities of mangrove areas in Karawang regency each village

| No | Village                | Toilets | Parking Place | Worship Place |
|----|------------------------|---------|---------------|---------------|
| 1. | Tambaksari             | -       | -             | 2             |
| 2. | Sedari                 | -       | 1             | 3             |
| 3. | Pusakajaya Utara       | 1       | 1             | 2             |
| 4. | Sukajaya               | 3       | 1             | 2             |
| 5. | Sukakerta              | 6       | 2             | 3             |
|    | Rawagempol Kulon       |         | -             | 1             |
| 7. | Muara Baru             | -       | -             | 3             |
| 8. | Muara                  | 1       | 1             | 3             |
3.4 Accessibility

Accessibility is important in the tourism and is one of the basic assets for increasing activities in an area. Accessibility is often associated with distance, travel time and travel costs [10]. The ease of access to the mangrove area is supported by the condition of the village roads that are passed. It can be said that the village has easy access, with road conditions that have been paved. In addition, distance is also a determining factor in attracting tourists to a tourist attraction. Based on table 4, overall villages in Karawang Regency have good road conditions with surface roads that have been asphalt. There are only 2 mangrove areas that have unpaved road surfaces, namely the Rawagempol Kulon and Muara mangrove areas. The road conditions for each village can be seen in figure 3 and figure 4.

| No | Village               | Road Condition | Distance from the city center | Traveling Time from The City Center |
|----|-----------------------|----------------|-------------------------------|-------------------------------------|
| 1. | Tambaksari            | Asphalt        | 44,6                          | 1 jam 16 menit                      |
| 2. | Sedari                | Asphalt        | 41,6                          | 1 jam 14 menit                      |
| 3. | Pusakajaya Utara      | Asphalt        | 38,3                          | 1 jam 5 menit                       |
| 4. | Sukajaya              | Asphalt        | 39,6                          | 1 jam 10 menit                      |
| 5. | Sukakerta             | Asphalt        | 41,5                          | 1 jam 11 menit                      |
| 6. | Rawagempol Kulon      | Dirt           | 42                            | 1 jam 16 menit                      |
| 7. | Muara Baru            | Asphalt        | 44,2                          | 1 jam 16 menit                      |
| 8. | Muara                 | Rocky          | 47,2                          | 1 jam 27 menit                      |
3.5 Potential attraction of mangrove ecotourism development

The classification of the potential attractiveness of mangrove ecotourism development is divided into three, namely, very attractive (1291-1710), attractive (871-1290), and unattractive (450-870). Based on the results of the attractiveness assessment, there is 1 village with a very attractive classification, namely Sukakerta Village with an attraction value of 1295, which is included in the very attractive classification. Whereas villages that have an attractive classification are in 5 villages, each of which has an attractiveness value that falls into the attractive classification, namely Sedari Village has a total attraction value of 995, North Pusakajaya Village has a value of 935, Sukajaya Village has an attraction value of 1025, Muara Baru Village has an attraction value of 890 and Muara Village has an attraction value of 870. While 2 villages are classified as unattractive, namely Tambaksari Village with an attraction value of 860 and Desa Rawagempol Kulon has an attraction value of 640. Classification and magnitude of the value of attraction in development ecotourism can be seen in table 5 and figure 5.

The village, which has a very attractive appeal to develop mangrove ecotourism, has a large number of attractions and complete facilities so that it can serve the needs of tourists. Meanwhile, villages that have unattractive attractions have a small number of attractions, and tourism facilities are incomplete.
and only available in a small number. Meanwhile, villages that are classified as attractive have quite varied numbers of attractions. Secondary and conditional facilities are almost complete but with a limited number. So it can be said that it is still able to meet the needs of tourists who come and tourist facilities are quite complete but still in small numbers. Accessibility to the mangrove location with indicators of distance and travel time from the capital is not an effect because each village has the same distance and travel time.

Table 5. Recapitulation of the potential value of attraction for mangrove ecotourism development in Karawang regency

| Village     | Primary facilities | Secondary facilities | Conditional facilities | Accessibility | Total score | Potential attraction |
|-------------|--------------------|----------------------|-----------------------|---------------|-------------|----------------------|
| Tambaksari  | 180                | 210                  | 120                   | 350           | 860         | Unattractive         |
| Sedari      | 240                | 210                  | 195                   | 350           | 995         | Attractive           |
| Pusakajaya Utara | 210            | 225                  | 150                   | 350           | 935         | Attractive           |
| Sukajaya    | 240                | 225                  | 210                   | 350           | 1025        | Attractive           |
| Sukakerta   | 240                | 345                  | 360                   | 350           | 1295        | Very Attractive      |
| Rawagempol Kulon | 150            | 135                  | 105                   | 250           | 640         | Unattractive         |
| Muara Baru  | 150                | 210                  | 180                   | 350           | 890         | Attractive           |
| Muara       | 150                | 210                  | 210                   | 300           | 870         | Attractive           |

Figure 5. Map of potential attraction for mangrove ecotourism development

4. Conclusion
The potential attractiveness of mangrove ecotourism development in Karawang Regency is 1 village that has a very attractive classification, namely Sukakerta Village. Meanwhile, villages with an attractive classification for ecotourism development are in the villages of Sedari, North Pusakajaya, Sukajaya, Muara Baru and Muara. However, further handling is needed to increase the attractiveness and participation of the community in its development so that mangrove ecotourism can continue to develop
and provide benefits to the surrounding community and government. Meanwhile, villages that have an unattractive classification are in Rawagempol Kulon and Tambaksari Villages due to inadequate facilities and difficult accessibility.

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