The Strategy of Sindangkerta Marine Tourism Objects Development, in Tasikmalaya, West Java

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ABSTRACT

This research was held in Sindangkerta Village and Sindangkerta Marine Wildlife Reserve, Sindangkerta Village, Cipatujah District, Tasikmalaya Regency, West Java Province. The implementation started in October 2019 until June 2020. The research aims to analyze the social and economic aspects of Sindangkerta Marine Tourism Object for the local neighborhood and to analyze the development strategy of the Sindangkerta marine conservation area. The research employed case study method in Sindangkerta Marine Wildlife Reserve by collecting primary and secondary data. Furthermore, the collected data processed with purposive sampling method via Microsoft Office Excel with SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis. The research resulted the villagers hasn’t been implemented the current system, according to the entire villagers they hope that the Sindangkerta Marine Wildlife Reserve Area potential can be further developed in order to provide more benefits for them. The best strategy for Sindangkerta Marine Wildlife Reserve development using SWOT Analysis in Quadrant I, by applying SO or an aggressive growth strategy with a coordinate point of 0.02; 1.10 means utilizing the strength to exploit the existed opportunities.

Keywords: Development strategy; SWOT; tourism; conservation.
1. INTRODUCTION

Ecotourism activity has a purpose as a way to grow the economy of the local community, besides having a positive impact on environmental preservation. Ecotourism also emphasized the existence of educational value principles according to Weaver (2008) that provide:

1. Knowledge about the surrounding environment, and;
2. Knowledge about the culture of the local community.

Sindangkerta Marine is one of the natural tourism objects located on the south coast area, which is one of the top tourism objects of Tasikmalaya Regency. Sindangkerta Marine has potential that can be developed such as ecotourism, coastal tourism, and water conservation areas. Based on the Decree of the Minister of Forestry, Number: 6964 / Kpts-II / 2002 at 17th July 2002, concerning the designation of Sindangkerta coastal area at Sindangkerta Village, Cipatujah District, Tasikmalaya Regency, West Java Province, covering a 90-hectare area as a forest area and a water conservation area named Sindangkerta Wildlife Reserve. The Sindangkerta Wildlife Reserve area is an integral part of the green turtle Conservation area (Chelonia mydas), the landing area at South Sindangkerta Marine reaches 150-hectare in total [1].

Regarding to the tourism potency, this condition has to be a concern for the BKSDA (Natural Resources Conservation Center) manager and also government needs to develop it properly without excessive exploitation and always supervise its development. Therefore, The Sindangkerta Marine tourist attraction needs to be studied further regard to fulfilling the demand of the appropriate development and management according to existing regulations and without overexploiting the tourism area with a good support from both the government and local society. So it is necessary to do a study on a strategy about developing the tourism object of Sindangkerta in Tasikmalaya.

The research of development strategy at Sindangkerta Marine tourism object aims to analyze the Sindangkerta Marine tourism potential and development, and the results of the analysis is expected to be a suggestion and recommendation for the government and society about Sindangkerta Marine tourism object which used as a preference in conducting utilization and policies of Sindangkerta Marine tourism object.

2. METHODS

2.1 Location and Research Time

The research was conducted in the Sindangkerta Marine Area, including the Sindangkerta Wildlife Reserve and Sindangkerta Tourist Area, Cipatujah District, Tasikmalaya Regency in October 2019 - June 2020. Geographically the Sindangkerta Wildlife Reserve area is located in 7°40'13.5" - 7°10" 52.4 "South Latitude and 1°11" 59.7" - 1°10"24.2" East Longitude. Based on the division of government administrative regions, this area is inside the states of Sindangkerta Village and Cikawungading Village, Cipatujah District, Tasikmalaya Regency, West Java Province. Sindangkerta Wildlife Reserve (SWR) conservation area is a Nature Reserve Area (NRA) under the Law Number. 5 of 1990 about Conservation of Living Natural Resources and its Ecosystems in addition to having the main function as a protection area for plants and animals diversity, including their ecosystems, moreover as a preservation area for life support systems [1].

2.2 Types and Collecting Data Methods

The research method used was the case study method (case study). Case study data obtained from all parties involved, in other words, data from this study collected from various sources. Types and sources of data used in observations during the research included primary and secondary data. In this study, primary data obtained by observation, active participation in the research field, and documentation. Secondary data gathered from the results of studies or research results, scientific publications, and the Sindangkerta Wildlife Reserve instance.

2.3 Collecting Data Techniques

The technique used in data acquisition from data sources (respondents) practiced in this study were observations, questionnaires, interviews, and literature studies. The applied method to get the questionnaire arranged purposely named purposive sampling for a particular reason (purpose sampling). Sampling accomplished by selecting tourist respondents to be interviewed who were visiting the sea-turtle conservation
area on the Sindangkerta Marine as many as 30 respondents. As well as respondents to be interviewed from a relevant institution such as the Department of Fisheries who provide information about turtle conservation tourism in the Sindangkerta Marine and the Sindangkerta village office and all Sindangkerta Marine community groups as the administrator.

2.4 Parameters Observed

The parameters observed in this study includes:

1. Biocological condition of the Sindangkerta Marine turtle conservation area in Tasikmalaya, West Java
2. Tourists’ characteristics at the Sindangkerta Marine turtle conservation area in Tasikmalaya, West Java
3. Tourists’ quantity at the Sindangkerta Marine turtle conservation area in Tasikmalaya, West Java
4. Benefits of the conservation area for the Sindangkerta Tasikmalaya villagers
5. Benefits of the conservation area for government and private companies
6. Strategy recommendations of managing Sindangkerta turtle conservation area in Tasikmalaya

2.5 Data Analysis

2.5.1 Descriptive and qualitative analysis

Analysis of quantitative data obtained in this research were the result of the respondent's questionnaire processed using the Microsoft Excel program. While the qualitative data obtained through observation and in-depth interviews. The combination of qualitative and quantitative data processed and analyzed so that it presented in the form of narrative texts, graphs, tables, column charts, or charts form, conclusions were drawn from all data that has been processed.

Fig. 1. Research location map
2.5.2 SWOT (strengths, weaknesses, opportunities, and threats) analysis

SWOT analyzes both internal and external factors that have been traits for conservation area in Sindangkerta Wildlife Reserve, Tasikmalaya. The internal factors are the factors that came from the ecotourism object itself, while external factors are things that can influence the existence of ecotourism objects from outside of the turtle conservation ecotourism object.

1. IFAS (Internal Strategic Factor Analysis Summary) and EFAS (External Strategic Factor Analysis Summary)

Both of these analyses are included to register all strengths and weaknesses trait. As well as the identification of external factors stage in registering all opportunities and threats [2].

2. IFE (Internal Factor Evaluation) and EFE (External Factor Evaluation)

The IFE matrix is used to analyze the internal environment so that the strengths and weaknesses factors that are created. Table Matrix EFE is used to analyze the external environment, so that obtained the factors that become opportunities by the encountered threats. The EFE matrix form presented in.

This SWOT Analysis will be producing a SWOT matrix.

Table 1. IFE matrix (internal factor evaluation)

| Essential Internal Factors | Quality | Rating | Score |
|----------------------------|---------|--------|-------|
| Strengths                  |         |        |       |
| 1.                         |         |        |       |
| 2.                         |         |        |       |
| etc.                       |         |        |       |
| Weaknesses                 |         |        |       |
| 1.                         |         |        |       |
| 2.                         |         |        |       |
| etc.                       |         |        |       |
| Total                      |         |        |       |

Table 2. EFE matrix (external factor evaluation)

| Essential External Factors | Quality | Rating | Skor |
|---------------------------|---------|--------|------|
| Opportunities             |         |        |      |
| 1.                        |         |        |      |
| 2.                        |         |        |      |
| etc.                      |         |        |      |
| Threats                   |         |        |      |
| 1.                        |         |        |      |
| 2.                        |         |        |      |
| etc.                      |         |        |      |
| Total                     |         |        |      |

Table 3. SWOT matrix

| IFAS EFAS | Strength(S) | Weakness (W) |
|-----------|-------------|--------------|
| Strengths factors | Determine several internal strengths factors | Determine several internal weaknesses factors |
| Opportunity (O) | SO Strategy | WO Strategy |
| Determine several external opportunity factors | Strategy using strengths to utilize the opportunities | Strategies to minimize weaknesses to utilize opportunities |
| Threat (T) | ST Strategy | WT Strategy |
| Determine several external threat actors | Strategies using strength to overcome threats | Strategies to minimize weaknesses to avoid threats |
Grading is done to each SWOT element with the following values [3]:

4 = crucial
3 = important
2 = important enough
1 = less important

Then, to determine the company's position using a matrix with the formula:

\[ S - W ; O - T \]

Explanation:

\begin{align*}
S &= \text{Strengths} \\
W &= \text{Weakness} \\
O &= \text{Opportunity} \\
T &= \text{Threats}
\end{align*}

The results of the calculation of the formula produced a single point coordinate, which is the point that determines the company's position in the SWOT analysis.

Explanation according to Rangkuti [3]:

**Quadran I (S-O Strategy)**

In this condition, it indicates profitable situation. The environment has chances and strengths so that it can be utilized. Strategies that must be implemented in this condition is to supporting the aggresive growth policy.

**Quadran II (S-T Strategy)**

Indicating some threats, but the environment still has strength from internal factors. Strategi yang harus diterapkan adalah menggunakan kekuatan untuk memanfaatkan peluang jangka panjang dengan cara strategi diversifikasi.

**Quadran III (W-O Strategy)**

The environment has a very big opportunity, but in another case, it faces some internal problems/weakness. This strategy focus is to minimize internam problems, so that the market oppotunity can be gained.

**Quadran IV (W-T Strategy)**

The environment is in unfavorable situation, because it faces some internal threats and weaknesses.

### 3. RESULTS AND DISCUSSION

#### 3.1 Operational Activity

##### 3.1.1 The sea turtles safeguarding during landing and laying eggs (marine patrol)

Patrol activities begin with preparing simple supporting tools such as headlamps or flashlights that serves as lights. The marine patrol time occurs after the highest tide, which is between 20.00 WIB and 06.00 WIB by traveling around and guarding the marine at each station. Patrols at the Wildlife Reserve itself do not have a specific schedule for people patrollers, but there is always a guard from BKSDA employees and partner communities.

Foraging behavior observed every day while laying behavior observed depends on the season. Foraging behavior on adult green sea turtles can be found every evening before sunset at the seashore Selokan Wangi which appears between crevices of coral reefs.

##### 3.1.2 Relocation of turtle eggs to the hatchery room

Relocation of turtle eggs carried out after the turtle has laid eggs. According to Reni Srimulyaningsih (2009), the process of green turtle digging a hole in KPS (Sindangkerta Turtle area) is around 14-21 minutes with the number of eggs in one nesting range between 90-120 eggs, so that the duration of the egg-laying process is about ± 2 h. Based on the interviews with Sindangkerta WR officers, it is known that the egg-laying behavior of green turtles in Sindangkerta WR consists of seven stages, included the adaptation stage, digging body pit, digging egg pit, egg-laying, closing the egg pit, closing the body pit and back to the sea. The green turtle who will be laying eggs usually appears to the sea surface and moves toward the land slowly, while overcoming the pull of the waves (Srimulyani 2009).

The turtle relocation activity carried out after the eggs removed by its mother, the time for relocation of the turtle eggs is 0-2 hours and must not exceed 2 hours. If more than 2 hours, at that time, the eggs have been entered the embryology phase, so there will be a change in position and disrupt the occurred cleavage process. Membranes or embryonic membranes in turtle eggs are very easy to tear if the eggs are rotated or shaken [4].
3.1.3 The green turtle egg incubation process (*Chelonia mydas*)

The incubation of turtle eggs arranged underneath the sand with 1 m depth, so that the temperature for the eggs is maintained and could increase the percentage of hatching eggs. The normal sand temperature in Sindangkerta WR itself is around 30-32 Celcius, and the change of sand is arranged every 6 months. Eggs’ hatching can occur for 45 to 60 days depending on the weather, and not all eggs can hatch. Turtle eggs usually hatch at night, when the eggs have hatched into hatchlings, the hatchlings will come out to the sand surface and will walk around the incubation room. The inspection in the incubation room is arranged every day, so if there some hatched turtles, the officer will be collecting and...
counting the hatchling. Afterwards, the hatchlings will be placed in the tub pool.

3.1.4 Hatchling nurturing

The tub water replacement in hatchlings' nurturing in Sindangkerta WR arranged once a week. If there are a lot of hatchlings, then the water changed once for 3 days. The water used in the nurturing tub will be taken directly from the sea, manually using a carried bucket, and the process itself took ± 1 hour. Feeding the hatchlings is given three times a day, in the morning, afternoon, and evening. The types of the provided feed are fish pellets, small fish (trash fish), or seaweed.

3.1.5 Hatchling release

The release of hatchlings in Sindangkerta WR is carried out at least in two weeks, and a maximum of three months. Hatchling is released when the hatchling can absorb oxygen (1 week old) so that they can dive 3-4 times in one minute. Data on the conservation of wildlife reserves in Sindangkerta marine in 2019 presented in Fig. 4.

3.2 Socio-economic Conditions of Local Communities

3.2.1 Social conditions of local communities

The community manner was assessed based on knowledge, attitudes, and behavior (Fig. 5). Some respondents said the sea turtles are useful biota to meet human needs, where eggs are used for consumption and trading.

The result of the community knowledge leads to unfavorable attitudes towards ecosystem sustainability. This attitude is notified with 53% of all respondents who have never helped conservation activities even though the distance from their house to turtle conservation is very close. However, several people also participated in environment preservation, as seen from the results of the questionnaire as much as 63% of respondents. The result of this research showed that in the interactive activities of the Sindangkerta Village community with tourists, not all of society joins the participation (Fig. 6).

![Recapitulation of Turtle Development in Sindangkerta WR Semi-Natural Captive Breeding in 2019](source: Profile of Sindangkerta WR 2019)
The results showed that 90% of all respondents said that the villagers in Sindangkerta interacted directly with tourists, but there were 10% of these villagers who did not interact directly with tourists. The community also considered upholding the existed norms. This is evidenced by the percentage of research results of around 93%. Those norms including religious, moral, sanitation, and legal norms.

The social process that occurred in Sindangkerta Village is presented in Fig. 7. The community included in the discussion related to ecotourism management in Sindangkerta Village, but not all villagers had a high interest in the ecotourism sector. Only a few people who often do.

The villagers' consideration of this marine ecotourism activity although few, yet it will provide better economic opportunities for the future. The community perception of Sindangkerta Village is presented in Fig. 8.

3.2.2 Economic conditions of local communities

Based on information sourced in the field research, not every Sindangkerta villagers who are live in the coastal communities, making the sea as the source of livelihood. The livelihoods of Sindangkerta Village are presented in Fig. 9.
Fig. 7. Social process in Sindangkerta village, Tasikmalaya

- Help when there is construction of public facilities: Yes - 77%, No - 23%
- Following the deliberations related to ecotourism management: Yes - 67%, No - 33%
- Convey your aspirations/ideas: Yes - 40%, No - 60%
- Involved social activities: Yes - 57%, No - 43%
- Like to work together/cooperation: Yes - 97%, No - 3%

Fig. 8. The Sindangkerta villagers perception at 2019

- The benefits society perceived socially: Yes - 93%, No - 7%
- The benefits perceived economically: Yes - 93%, No - 7%

Fig. 9. The livelihoods of Sindangkerta villager at 2019

- Food Seller: 47%
- Cottage Owner: 30%
- Fishers: 10%
- Tire Rental: 10%
- Dress Seller: 3%

Yes | No
The villagers' income is influenced by the number of tourists visiting Sindangkerta beach. Therefore, the amount of money that people have earn on each months are uncertain. The time and number of tourists who come are uncertain on each days, but on holidays, usually, the tourists will increase.

Based on interviews conducted with the villagers of Sindangkerta that 77% of the condition of the house is permanent with walled walls. Only a small portion of around 23% of Sindangkerta villagers use traditional house walls (bamboo wall). The status of the property occupied is private property.

3.3 Internal and External Environments Identification

3.3.1 Internal environment identification of Sindangkerta marine wildlife reserve

Sindangkerta Marine conditions that are still protected make this area become one of the favorite tourist objects to visit. This object usually is crowded during holidays, such as religious holidays and new years. Data on tourists visiting Sindangkerta Wildlife Reserve in 2019 presented in Fig. 10.

Sindangkerta Marine Wildlife Reserve is located in the overlap area of the Tasikmalaya Region Conservation Section (RCS) VI, the Natural Resources Conservation Area (NRCA) Region III of Ciamis, the Natural Resources Conservation Center (NRCC) of West Java.

Sindangkerta Marine Wildlife Reserve is equipped with several facilities and infrastructure to support all activities carried out. The facilities and infrastructure consist of work huts, hatchlings tub, and turtle hatcheries. Facilities and infrastructure are presented in Table 4 and Fig. 11.

Based on the analysis of sand fraction on turtle nesting substrate in Sindangkerta Marine showed that the sand fraction at Sindangkerta Marine consists of rough sand by 92.3%, fine sand by 7.0%, very fine sand by 0.2%, dust by 0.40% and, clay by 0.10% [5]. The observation results of semi-natural nest humidity in Sindangkerta Beach in the morning is about 95-70%. The range of nest humidity during the day is about 65-30%. In the afternoon, the humidity is about 88-52%. The result of the observation showed that the humidity at the research location is suitable for turtle hatching.

3.3.2 External environment identification of Sindangkerta marine wildlife reserve

Community participation on managing the the Sindangkerta Marine Wildlife Reserve has been going quite well. Local partners are involved in night/patrol guards stationed at several turtle landing stations (tasked to monitor turtles going up to the marine, laying eggs, and relocating eggs). The presence of local partner groups has been an essential role in helping to preserve turtle conservation areas [6,7].

![Sindangkerta Villagers Income for a Month IN 2019](chart.png)

**Fig. 10. Sindangkerta villagers’ income for a month in 2019**
Fig. 11. Condition of Sindangkerta villagers houses in 2019

Fig. 12. Tourists quantity data at 2019

Source: Sindangkerta Marine Wildlife Reserve Profile in 2019

Table 4. Facilities and infrastructure in Sindangkerta marine wildlife reserve

| Number | Facilities and Infrastructure | Quantity (unit) | Location                        |
|--------|-------------------------------|-----------------|---------------------------------|
| 1      | Work Station                  | 1               | Across the Marine               |
| 2      | Nurturing Tub                 | 2               | Tegal Sereh Egg Laying          |
| 3      | Hatching Tub                  | 1               | Next to Nurturing Tub           |

Fig. 13. Facilities and infrastructure in Sindangkerta marine wildlife reserve
The manner of Sindangkerta villagers before the local partners formed towards the management of the Sindangkerta Marine Wildlife Reserve was indifferent. Lack of public awareness for the sea turtles conservation, made people utilized the turtle eggs they found. After socialization through counseling from the management of Sindangkerta Marine WR and the formation of local partners, the community began to realize that consuming or trading turtle eggs is prohibited.

However, in the last few years, there are still fishermen who have cold manner. Where they still use the Rawe Senggol fishing tool, even though this tool can endanger sea turtles. The sea urchins that trapped in fishermen's Rawe Senggol, can be injured and causing death. These are the catching tools and turtle bodies that found at the research site.

Sindangkerta Marine is a beautiful marine and still preserved. However, it doesn't rule out the possibility that the natural condition in this area is sometimes unfriendly since high tides occurred in the bad weather. This can cause abrasion, where there is a narrowing or coastal reduction, and also causes the fall of the trees. When the dry season comes, it causes the leaves to fall from the trees. This can be causing the light from the road to expand to the marine. As for the result, the less turtle rises to the marine.

3.4 The Formulation of Strategy of Sindangkerta Marine Wildlife Reserve Development

3.4.1 Matrix of internal strategy factor analysis summary (IFAS)

These are the results of calculations on the internal factors of the Sindangkerta Marine Wildlife Reserve to determine the strategies used through the SWOT analysis presented in Table 5.

Based on the assessment of 15 respondents at Sindangkerta Marine then those included in the internal factors were strength i.e

1) Sindangkerta Marine Wildlife Reserve is ecotourism based on education. The education area at the tourist site is believed to be able to the mindset changing of the community about a better sea turtle conservation. This area can also be used for research, education, marine tourism, and can also be used by the community for productive economic development with regard to notice the principles of the friendly environment and sustainable.

2) Sindangkerta Marine conditions are still maintained its beauty. This area became one of the favorite tourist attractions visited by tourists. This area is always been crowded during holidays, such as new years and religious holidays.

3) Sindangkerta Turtle Conservation is managed by the Sindangkerta Wildlife Reserve under the Ciamis 3rd Region Natural Resources Conservation.

4) The Sindangkerta Marine Wildlife Reserve has been equipped with several facilities and infrastructure to support all activities carried out including guarding huts, toilets, and parking lots.

5) The entrance fee is not ideal price for entering Sindangkerta WR. However, to enter Sindangkerta Marine, there is a fee charged. One person charged by Rp. 5.000 on a weekday. While on the weekends, they charged Rp. 10.000.

6) Generally, the condition of the green turtle nesting habitat in Sindangkerta Marine included in the criteria according to the marine slope texture and sand spacing with the feed area.

Fig. 14. Fishing gear causes turtle death
Table 5. Results of respondents' assessment on internal strategy factors

| Number | Internal Strategy Factors | Quality | Rating | Scores (quality X rating) |
|--------|---------------------------|---------|--------|--------------------------|
| 1      | Sindangkerta Wildlife Reserve is an ecotourism based on education | 0.10    | 4      | 0.49                     |
| 2      | Frequently visited ecotourism area | 0.12    | 3.27   | 0.33                     |
| 3      | Sindangkerta turtle conservation Managed by Sindangkerta Wildlife Reserve | 0.08    | 3.93   | 0.49                     |
| 4      | Complete facilities and infrastructure to support ecotourism | 0.09    | 2.53   | 0.20                     |
| 5      | Entrance fee that is not ideal | 0.11    | 3.27   | 0.31                     |
| 6      | The habitat of the turtle conservation area is suitable | 0.10    | 3.8    | 0.42                     |
|        | **Total Strength**      |         |        | **2.24**                 |

**Weaknesses**

| Number | Internal Strategy Factors | Quality | Rating | Scores (quality X rating) |
|--------|---------------------------|---------|--------|--------------------------|
| 1      | Facilities and infrastructures with less less quality | 0.08    | 2.6    | 0.21                     |
| 2      | Ecotourism location far from the city center | 0.09    | 3      | 0.27                     |
| 3      | Night lighting at Sindangkerta Marine | 0.07    | 2      | 0.13                     |
| 4      | Turtle eggs laying observation | 0.13    | 4      | 0.53                     |
|        | **Total Weaknesses**      |         |        | **1.14**                 |
|        | **TOTAL**                 |         |        | **1.00**                 |

While the results of the respondents' assessment of the factors are included in the internal factors are weaknesses i.e.

1) Sindangkerta Wildlife Reserve is equipped with facilities and infrastructure. But it hasn't complete yet, and there are facilities and infrastructure in less quality. Such as the damaged information board that hasn’t been repaired and there is no automatic water pump for the hatchling tub water replacement, it is still carried out manually by carrying water using a carried bucket.

2) There are only few people who have discover Sindangkerta Marine because its existence is quite far urban regions. To get to the location, it can be reached from Sindangkerta (Capital District) as far as 500 m, Tasikmalaya (Capital Regency) as far as 69 km, Bandung (Capital Province) as far as 163 km, and from Jakarta (Capital of Indonesia) as far as 308 km.

3) Although in general, the condition of the green turtle nesting habitat in Sindangkerta is appropriate, the status of vegetation cover and lighting on Sindangkerta Marine at night toward the inappropriate category.

4) Observation of turtle nesting in Sindangkerta Marine is carried out every night by Sindangkerta WR officers and local partners. However, there is no explicit schedule individually. As a result, sometimes there are only a few people guarding at night. There is also no specific placement of each person in each nesting zone.

3.4.2 Matrix of external strategy factor analysis summary (EFAS)

These are the results of calculations on the internal factors of the Sindangkerta Marine Wildlife Reserve to determine development strategies through the SWOT analysis presented in Table 6.

Based on the assessment of 15 respondents in Sindangkerta Marine WR, those included in the external factors are opportunities, i.e: The management of Sindangkerta Wildlife Reserves has been going quite well. The management of the Sindangkerta Wildlife Reserve involves local communities, in the form of patrols carried out every night. This can encourage a sense of belonging and protecting the habitat and species that are the main focus of conservation area management. The existence of stakeholder participation as an effort to manage the Sindangkerta Marine Wildlife Reserve, specifically the involvement of stakeholders in making decisions related to conservation activities. The establishment of the Mitra community group in collaboration with the government (manager of the Sindangkerta Marine Wildlife Reserve) to conduct surveillance around the conservation area.
### Table 6. Results of respondents’ assessment of external strategy factors

| Number | External Strategy Factors | Quality (Q) | Rating (R) | Score (Q x R) |
|--------|---------------------------|-------------|------------|---------------|
| **Opportunities** | | | | |
| 1 | Management involves local communities | 0.11 | 3.8 | 0.40 |
| 2 | Existed Stakeholder role | 0.09 | 3.27 | 0.29 |
| 3 | Collaboration among stakeholders | 0.09 | 3.53 | 0.33 |
| 4 | Government support | 0.08 | 2.87 | 0.24 |
| 5 | The implementation benefits according to the local community | 0.10 | 3.6 | 0.37 |
| **Total Opportunities** | | | | 0.48 | 1.63 |
| **Threats** | | | | |
| 1 | The lack of public knowledge about sea turtle conservation | 0.09 | 3.13 | 0.28 |
| 2 | The indifferent attitude of the local communities | 0.10 | 3.27 | 0.31 |
| 3 | Conflicts between communities and central government | 0.11 | 3.6 | 0.39 |
| 4 | The ongoing conflict | 0.11 | 3.6 | 0.39 |
| 5 | The nature condition is uncertain leading to bad weather | 0.06 | 1.87 | 0.12 |
| 6 | Suitability of fishing gear | 0.06 | 2 | 0.12 |
| **Total Threats** | | | | 0.53 | 1.61 |
| **Total** | | | | 1.00 | |

Each stakeholder holds basic tasks and particular duties so that the implementation created a good collaboration to achieve the same goal. Government support started in 1974, the Regent of Tasikmalaya announced a Decree of the Regent No.B.IV / Huk-1/37/1974 at 8th April 1974 concerning the Maintenance and Business of Breeding Sea Turtles on the South Coast of Tasikmalaya. Recommendation of the Governor of West Java Number 552.51 / 2435 / BPLH / IX / 2001 on 4 September 2001 concerning the appointment of the Sindangkerta conservation area. Then the Minister of Forestry Decree No. 6964 / Kpts-II / 2002 was published on 17 July 2002 concerning the Appointment of the Sindangkerta Marine area in the Sindangkerta Village. Community involvement in the Sindangkerta Wildlife Reserve management has been operated quite well. The community is involved in the principal daily activities in the conservation area, namely as a night watchman stationed at each turtle landing station (tasked with overseeing turtles going up to the marine, laying eggs and, relocating eggs). Indirectly the manager has given confidence to the community to get involved in Sindangkerta Wildlife Reserve management activities.

Based on the assessment of 15 respondents at Sindangkerta Marine, then those included in the external factors were threats i.e; Society hasn’t understood the three concepts of conservation, such as protection, preservation, and utilization. The community assumes that conservation is only a protecting activity [8,9]. Limited public knowledge showed that the socialization about sea turtles conservation through counseling hasn’t been optimal for society. The socialization activities given, so far still very limited. The socialization is given only to the public figure, and it did not reach the wider community. Indifferent community manners which influenced by society’s knowledge about conservation. Some people already aware of the importance of turtle conservation efforts, which marked by reporting landed turtles by the local people to the officers. Conflicts that occurred about perspective differences among people who think that the local people can utilize the sea turtle eggs which assume shared ownership while on the other hand, the State has the right to regulate all available resources [10,11].

The conflict started with the utilization of sea turtle eggs by the community but ended by the socialization given by officers through the formation establishment of community partners and also establishment of community empowerment to increase economic value. But, it was constrained so it hasn’t worked yet until now. When the weather is bad, high tides also storm occurred so that the abrasion happened and disrupted the development of conservation. Another thing that becomes a disturbance is the uncertain natural conditions during the dry...
season by many trees that shed its leaves, then make the lights enter the marine so that the rise of the sea turtles is not according to the existed schedule. The increasing of dead sea turtles died because of the fishing gear used by fishermen in the form of Rawe Senggol. The response taken by the Sindangkerta Wildlife Reserve officer to the fishermen is to provide socialization regard to fishing gear that harms the turtle. This step has resulted in the number reduction of dead turtles, although there are still some turtles have died until this day.

3.4.3 Strength, weakness, opportunities, threats (SWOT) analysis

Internal factors have a total value of 2.24 for strengths, and 1.14 for weaknesses, so strengths are ruling over weaknesses in determining the development strategy of Sindangkerta Marine Wildlife Reserve.

On external factors, the total value of opportunities is 1.63 and threats 1.61 so that external opportunities dominate slightly more than the threat factors faced by the Sindangkerta Marine Wildlife Reserve in determining the strategy to developing conservation areas.

The total value of this score can indicate the reaction of the Sindangkerta Marine Wildlife Reserve to its internal and external strategic factors, and can also be used to compare the Sindangkerta Marine Wildlife Reserve with other similar ecotourism locations. Here is a series of scores obtained from the results of research conducted on internal and external factors of the Sindangkerta Marine Wildlife Reserve, i.e

- Strength = 2.24
- Weakness = 1.14
- Opportunity = 1.63
- Threats = 1.61

The Cartesian diagram as a strategy for developing the Sindangkerta Marine Wildlife Reserve presented in Fig. 13.

3.4.4 Strength, weakness, opportunities, threats (SWOT) analysis

The Cartesian diagram results showed the position or state of the Sindangkerta Marine Turtle Coastal Park is in quadrant I by applying the Strength - Opportunities strategy, a strategy used strength to take advantage of existed opportunities. The alternatives that can be applied are the indicators found in Strength and Opportunities presented in Table 8.

3.4.5 The definition of Sindangkerta marine wildlife reserve strategy

Based on the results of the matrix analysis of the strategy using the SWOT matrix, resulting from the merger of the strength factor with the opportunity factor (S-O). These are the steps in carrying out an S-O strategy: Increase education-based ecotourism with the principle of stakeholder-based management to increase the benefits perceived by the community (S₁ - O₁,2,3,5). Increase education-based ecotourism with the principle of stakeholder-based management to increase the benefits perceived by the community. Each stakeholder has a clear principal duty and function to facilitate its implementation. In the social aspect, the presence of sea turtles conservation makes Sindangkerta Village better known by the wider community while in the economic aspect, the presence of sea turtles conservation increases the community income even though the amounts are uncertain.

Increase the number of tourists to increase the benefits perceived by the community (S₂ - O₅) The benefits perceived by the local community with the establishment of the conservation area expected to increase the number of visitors. This can be done by adding advertisements to the public to visit this location, created by the manager, or creating a social media account so that people are interested in Sindangkerta WR activities because, at this location, the community not only taking a vacation but also learn about sea turtles which almost extinct.

Table 7. Score recap of FAS and EFAS

| Internal Scores | External Scores | Strategy Choices |
|-----------------|-----------------|------------------|
| S > W (+)       | O > F (+)       | Growth           |
| S < W (-)       | O < F (-)       | Survival         |
| 2.24 > 1.14     | 1.63 > 1.61     |                  |
| S > W (+)       | O < F (-)       | Diversification  |
| S < W (-)       | O > F (+)       | Stability        |
Fig. 15. Cartesian diagram as a strategy for the Sindangkerta marine wildlife reserve

**Table 8. Matrix results of SWOT analysis**

| S                  | O  | O1 Management involves local communities |
|--------------------|----|----------------------------------------|
| S1 Ecotourism based on education | O2 Stakeholder's specific role |
| S2 Frequently visited by tourists | O3 Collaboration between stakeholders |
| S3 Managed by Sindangkerta Marine Sea Turtle Wildlife Reserve | O4 Government support |
| S4 Facilities and infrastructure | O5 Benefits implementation by local people |

Improve the management quality of the Sindangkerta Sea Turtle Wildlife Reserve with the principle of collaboration between all existing stakeholders (S2 - O1,2,3,4). The management quality in Sindangkerta Marine Sea Turtle Wildlife Reserve improved with the support of all existing stakeholders. New regulations in the form of strict penalties must be established for those who are still stealing or consuming turtle eggs. Also for the fishermen who still use the Rawe Senggol fishing gear are given strict penalties so that the number
of this biota not continuously decreased in nature.

Improve the quality of existing facilities and infrastructure to support better management ($S_4 - O_{1,2,3}$). Improving the quality of facilities and infrastructure adapted according to the needs. When one of the stakeholders needs facilities and infrastructure, the Sindangkerta Marine Sea Turtle Wildlife Reserve needs to increase or improve the quality of existing facilities and infrastructure. This is to improve management based on stakeholder participation to be even better so that it can support the Sindangkerta Marine Sea Turtle Wildlife Reserve. Moreover, the biota is well cared for, and the handler is comfortable in carrying out patrolling activities at the Sindangkerta Marine Sea Turtle Wildlife Reserve.

Evaluate the entrance fee which is not a benchmark to support the government and the benefits perceived by the community ($S_5 - O_{4,5}$). There is no charge for entering Sindangkerta Marine Turtle Wildlife Reserve so that managers can provide income to complete the existing facilities and infrastructure so that the number of tourists who come continues to increase. This will certainly have an impact on the economy of the community.

Improve the condition of turtle nesting habitat to increase the benefits perceived by the community ($S_6 - O_2$). The condition of turtle nesting habitat, which is suitable for turtle nesting should be improved so that the number of turtles that reach up to the coast doesn't decrease due to bad environmental conditions. As for moving the location of the spotlight when the dry season comes and planting trees to reduce the occurrence of coastal abrasion. This will indirectly benefit the local community.

4. CONCLUSIONS
The conclusions from the research results of Sindangkerta Tasikmalaya Marine Tourism Object Development Strategy are:

1. Concluding from the social and economic aspects, the influence of the Sindangkerta Marine Sea Turtle Wildlife Reserve presence has not been perceived by the entire community, due to the interests and economic levels of the community. Community expects the Sindangkerta Marine Wildlife Reserve area potential can be further developed in order to provide more benefits for them.. The potentials in the Sindangkerta marine tourism objects are as diverse as the tourism products by the beauty of the marine and the biodiversity of the turtle habitat in the Sindangkerta Wildlife Reserve.

2. The development strategy in Sindangkerta Marine ecotourism notified from the results of the SWOT analysis included in the Cartesian diagram obtained coordinates (0.02; 1.10), which is in quadrant I, is an SO strategy by supporting aggressive growth policies that utilize the power to seize exists opportunities. This is arranged by increasing education-based ecotourism, the number of tourists, the quality of management, evaluating entry fees to support the government in managing and improving conditions for recording eggs with stakeholder-based management principles to optimize the benefits implemented by the community.

CONSENT

As per international standard or university standard, respondents’ written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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