

# Study of Marine Ecotourism Potential of Cingkuak Island West Sumatera Province

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## ABSTRACT

*Cingkuak Island is one of small islands in West Sumatera Province. Cingkuak Island has been selected as an area of marine tourism development by the local government of Pesisir Selatan Regency since 2002. The aim of the study was to assess the potential of Cingkuak Island as marine tourism destination, and analyzed its potential for marine ecotourism development. The method used in the research included survey method, data collection (primary and secondary). Purposive sampling method was used for interview and questionnaire, particularly for tourists has been used accidental sampling method. The result of the study showed that Cingkuak Island has a big potential for marine tourism destination and possesses a big chance to be developed into a marine ecotourism area. It has been measured by the suitability values of marine ecotourism development. The values are resulted through tourism supporting criteria, total scores of WTA and WTP, economic potential values, and SWOT analysis.*

**Keywords:** Potential, Marine Ecotourism, Cingkuak Island

## INTRODUCTION

In last few decades, tourism has been considered as one of the promising sectors to elevate the growth of national economy. Some countries, such as Antiqua and Barbuda, Aruba, and Anguilla has been succeed to achieve more than 75% of their growth domestic products (GDP) from tourism sectors. The significant increase has been able to accommodate more than 80% of workforce in each country (World Travel and Tourism Council, 2006).

Indonesian government itself through the resolution of Indonesian Consultative Assembly of the People (MPR) No.9/1998, has directed the activities of tourism to be a leading sector in Indonesian development process. In 2000, the tourism sector has contributed 9,27% of the total Indonesia GNP and has absorbed 8% of the total national workforce (Ministry of Tourism of Indonesia, 2002). Cingkuak Island has been selected as an area of marine tourism development by the local government of Pesisir Selatan Regency since 2002. In last few years, especially in 2010 and 2011, this island has been showed significant increases in the number of tourist visits until 80% increase from domestic and 5% increase from foreign tourists (Department of Tourism of Pesisir Selatan, 2011).

Despite the importance of the study of marine ecotourism potential for Cingkuak Island as a basic standard in the development of the island which was still not exist. Therefore, the authors are interested to do research on the study of marine ecotourism potential in Cingkuak Island. The research objective was to assess the tourism potential of Cingkuak Island as an area of marine tourism destination, and analyzed the potential of the island as one of area of marine ecotourism development. The results of the study are expected to provide information and reference in the development of Cingkuak Island to be a marine ecotourism destination.

## METHODS

The research was conducted on May 2012 in Cingkuak Island of West Sumatera Province. The method used in the study was survey methods, while the data were consisting primary and secondary data. The primary data were covering tourism supporting criteria (geomorphology, type of substrates, coastal ecosystems, waters quality, climate, uniqueness, culture and historical values). Secondary data were including document and references which relevant to the research.

The Sample of questionnaires used purposive sampling, particularly for tourists used accidental sampling. The respondents of the research were consisted of local society, local were analyzed with descriptive analysis, data the value of willingness to accept (WTA) and potential.



## RESULTS AND DISCUSSIONS

### Results, Supporting Criteria of Tourism

Geographically Cingkuak Island located at position  $01^{\circ} 21' 01''$  –  $1^{\circ} 22' 06''$  of South Latitude and  $100^{\circ} 32' 54''$  –  $100^{\circ} 33' 36''$  of East Longitude. In the west Cingkuak Island border with Semangki Gadang and Semangki Ketek Island, in the east border with Kereta and Sumatera Island, in the north border with Sumatera and Kereta Island, and in the south border with Aua Gadang, Aua Ketek Island, and the Indian Ocean. The total area of Cingkuak Island is about 5-7 ha (Department of Marine and Fisheries, 2006). Oceanographic physicochemical parameters of Cingkuak Island can be figured out from Table 1

Table 1. Oceanographic Physicochemical Parameters of Cingkuak Island

Station	Current Velocity(m/s)	Clarity(m)	Surface Temperature(°C)	Salinity (ppt)	pH
I	0,08	12,00	29	32	7
II	0,07	11,68	30	32	8
III	0,05	10,20	30	32	8
IV	0,14	10,60	29	32	7
V	0, 26	13,80	29	32	7
VI	0,16	09,09	30	32	8
VII	0,08	10,32	30	32	8
VIII	0,13	12,47	29	32	7

Source: Primary Data, 2012

Based on geomorphologic, Cingkuak Island has a dynamic and variety of topography. Most of the topography in the island is hilly and steep. Parts of the hilly and steep reach 2/3 of the total area of the island. The maximum height of the hills is about 25 m above sea level. The flat area is in the North of the island which is adjacent to Sumatra Island, while the western and eastern part has more moderate slope. The southern part was the steepest topography and dominated by rocky mountain associated with ocean currents. Cingkuak Island has a different depth and slope at different part of the coastal area, the various depths can be figured out form Table 2.

Table 2. Waters Depth and Slope Parameter of Cingkuak Island

Stasiun	Depth (m)	Distance from Coastal* (m)	Beach Slope = C/L x 100 %
I	2,6 m	30 m	8,67
II	4 m	30 m	13,33
III	1,3 m	30 m	4,33
IV	2 m	30 m	6,67
V	1 m	30 m	63,33
VI	1 m	30 m	3,33
VII	1,2 m	30 m	4,00
VIII	8 m	30 m	26,67

Source : Primary Data, 2012

The type of the beach substrates of Cingkuak Island dominated by sandy substrates with a yellowish white color, it is type of aerobic sand (Bengen, 2002). The type of substrate scattered throughout the northern, eastern and western of Cingkuak Island. While in the southern has kind of rocky substrates. In the southern is also found cliff formations until 25 m of height above the sea level. The type of beach substrates of Cingkuak Island can be seen in detail in Figure 1.

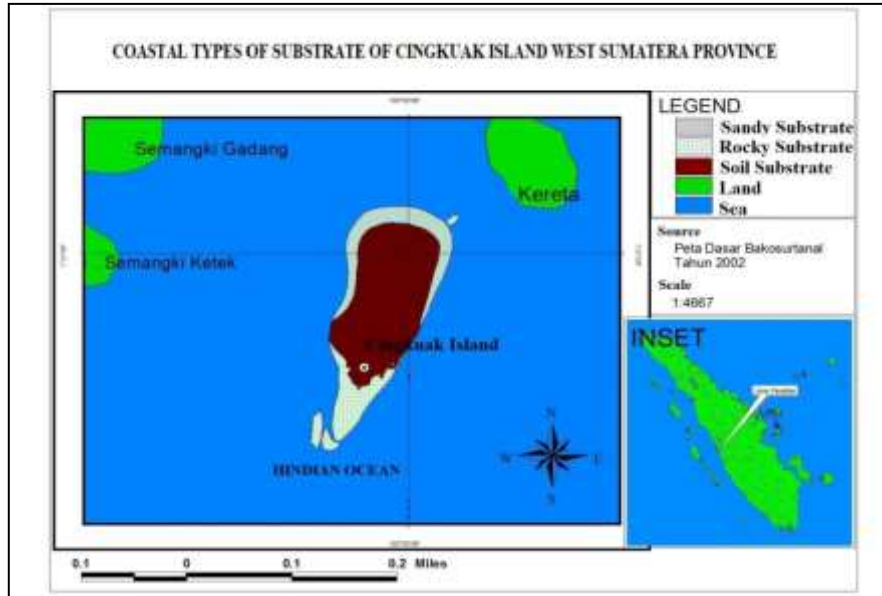


Figure 1. Tipe of the substrate of Cingkuak Island

The climate condition of Cingkuak Island based on annual rainfall ranged between 114.32 mm/year. The highest rainfall in Cingkuak Island occurs around January and December, the lowest rainfall occurs in May. The air temperature ranged between 22 °C - 28 °C and 23 °C - 32 °C (Regional Planning and Development Agency of Pesisir Selatan Regency, 2010).

Cingkuak Island has a complex coastal ecosystem, included three main ecosystems of coastal areas: mangrove, sea grass and coral reef ecosystems. Mangrove ecosystems spread out on the western and the eastern of Cingkuak Island. Mangrove species on the island include *Acostricum spp*, *Excoecaria agallocha*, *Ipomea spp*, *Morinda citrifolia*, *Pandanus sp* and *Passiflora foetida*. Sea grass is widespread in Cingkuak Island, especially in the west and the east. Sea grass types in Cingkuak Island are *Enhalus acoroides* and *Thalasia hemprichii*. Coral reef ecosystems are found in almost all parts of P. Cingkuak except in the south, which faces with the Indian Ocean. The dominant reef fish species there are 18 species representing 2 genera of the genera *Chaetodon* and *Heniochus* (Department of Marine and fisheries of Pesisir Selatan Regency, 2010). In detail it can be seen in Figure 2.

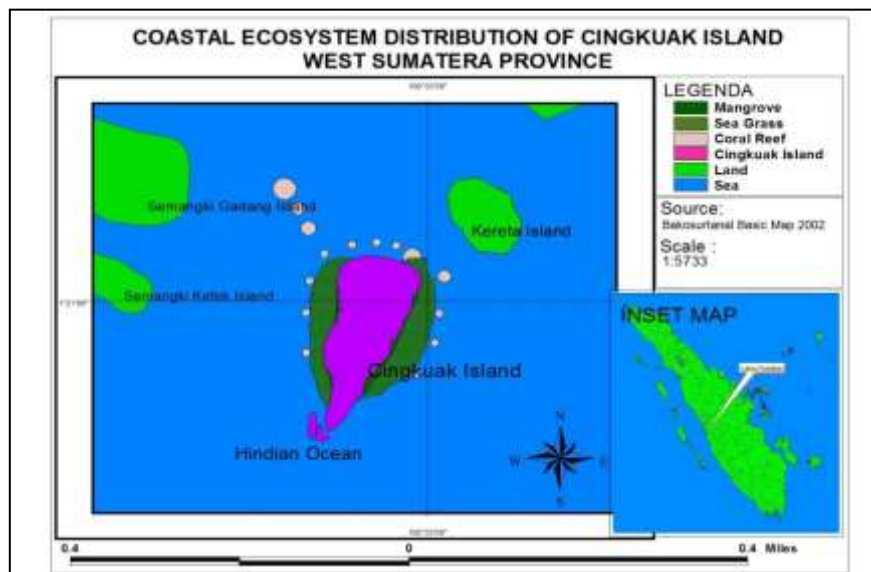


Figure 2. Map of Ecosystem Distribution of Cingkuak Island

Madame Van Khempain who is the wife of one of the dutch generals named Thomas Van Kempen Janz. Portuguese forts in Cingkuak Island was built in the early 16th century AD (Wikipedia, 2012).

**Tourism Actors Perspectives on the Development of Marine Ecotourism**

In general, the perspectives of local society, local business, local government, and tourists regarding the development of marine ecotourism Cingkuak Island can be seen in Figure 3.

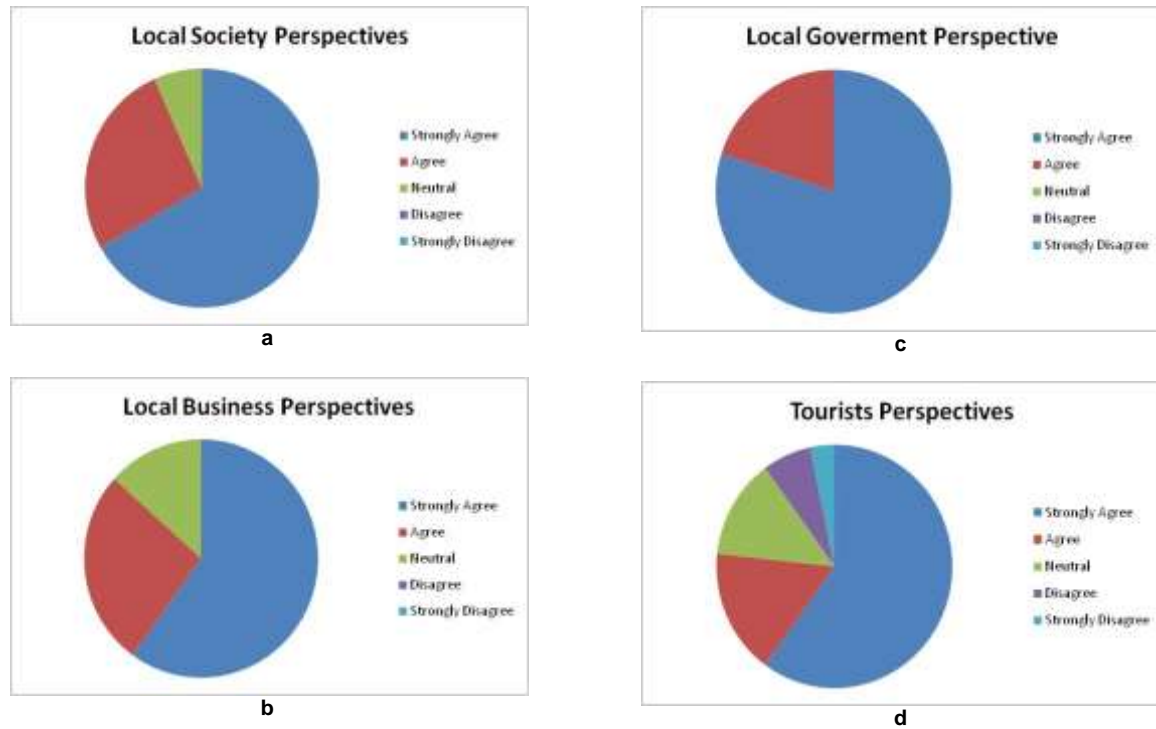


Figure 3. Tourism actors perspectives on the development of marine ecotourism: (a) local society perspectives; (b) local government perspectives; (c) local businesses perspectives; and (d) local tourists perspectives

**SWOT Analysis**

The overview of marine tourism potential of Cingkuak Island was analyzed with SWOT analysis can be figure out from Table 4.

Table 4. SWOT Analysis of Marine Tourism Potential of Cingkuak Island

No	Strengths	Weakness
1	Natural and Beach Attraction	Lack of Concept and Strategy
2	Biota and Ecosystem Diversity	Lack of Human Resources
3	Historical Values	Lack Management
4	Society Hospitality	Lack of Business Creativity
Opportunity		Threats
1	Social Prosperity	Environmental degradation
2	Economic Potential	Culture Degradation
3	Culture Promotion	Conflict of Interest
4	Research and Conservation	Social Conflict

Source: Primary data, 2012

**The value of WTA and WTP**

The values of WTA and WTP of marine tourism of cingkuak island can be figured out from Table 5-6.

Table 5. Average Values of WTA

No	Tourism Objects and Activities	WTA(IDR)
1	Scuba Diving Equipment Rental	600.000
		20.000
		40.000
		30.000

5	Banana Boat Trip Rental	15.000
6	Boat Rental	300.000
7	Souvenir	25.000
8	Sea Food Price	26.5000
9	Fishing with Motor Boat	350.000
10	Fishing With Boat	200.000
11	Jet Sky Trip	100.000
12	Motor Boat Trip Around Island	120.000
13	Boat Trip Around Island	100.000
14	Boat Rental	80.000
15	Island Home Stay Rental	75.000
16	Paragliding Equipment Rental	300.000
17	Local Foods	25.000
<b>Average</b>		<b>155.588</b>

Table 6. Average Values of WTP

No	Tourism Objects and Activities	WTP(IDR)
1	Scuba Diving Equipment Rental	683.000
2	Snorkling Equipment Rental	27.000
3	Tracking Tour Guide	50.000
4	Portuguese Fort Tour Guide	35000
5	Banana Boat Trip Rental	20.000
6	Boat Rental	300.000
7	Souvenir	30.000
8	Sea Food Price	32.500
9	Fishing with Motor Boat	500.000
10	Fishing With Boat	300.000
11	Jet Sky Trip	150.000
12	Motor Boat Trip Around Island	115.000
13	Boat Trip Around Island	122.000
14	Boat Rental	100.000
15	Island Home Stay Rental	100.000
16	Paragliding Equipment Rental	250.000
17	Local Foods	50.000
<b>Average</b>		<b>168.500</b>

### Economic Potential of Cingkuak Island Marine Tourism

The potential of marine tourism of Cingkuak Island in 2011 was estimated about IDR. 14.751.669.500. This was calculated with the following formula:

$$\begin{aligned}
 PE &= WTP \text{ Average} \times W \\
 &= \text{Rp. } 168.500,00. \times 87.547 \\
 &= \text{Rp. } 14.751.669.500
 \end{aligned}$$

## DISCUSSIONS

### Suitability Analysis of Tourism

An analysis of the suitability tourism conducted to observe the value of the tourism potential of a tourism object (Regional Planning Agency of Pesisir Selatan Regency, 2010). To analyze the suitability of Cingkuak Island to portray the extent of Cingkuak Island development to be a tourist destination can be explained by the analysis below:

Based on Tourism Supporting Criteria:

P. Cingkuak has a strategic position that is located about 1 mile from Sumatra Island and can be reached for 3-5 minutes by speedboat from Painan the capital city of Pesisir Selatan Regency. Cingkuak Island has also a tropical climate which is the potential value in the development of marine tourism.

Cingkuak Island has a good oceanography physicochemical quality. There was no any pollutant indication in the waters. The water temperature ranged from 29-30<sup>o</sup> C, 32 ppt of salinity, 7 – 8 of pH, 08 - 13 m of water transparency, 0.05 to 0.26 m/s of current velocity, with an average value of 1.12 m/s. Based on the oceanographic conditions Cingkuak Island is considered suitable for activities such as swimming, snorkeling and diving, according to the criteria of the Ministry of Planning and Development Government of Trinidad and Tobago (1974).

Geomorphology form was used as a feature in the promotion of tourism and has an important Geomorphology of Cingkuak Island has a very hills with about 25 m of height above the sea a basis for the development of environmentally



friendly resort, and the location of fun beach, sunbathing, swimming, and snorkeling. The west and east sides have a good location for sightseeing, but swimming and snorkeling activities are not recommended in these locations. This was caused by the two sides are the base location of sea grass and coral reef ecosystems. So, swimming and snorkeling may harm the sea grass and coral reef ecosystems. The south side of the island has a potential for sightseeing, and suitable for camping and tracking area.

Based on the depth and slope of Cingkuak Island beach parameters, it supports the tourism activities such as sunbathing, swimming, and snorkeling according to the Ministry of Planning and Development Government of Trinidad and Tobago (1974). Most part of Cingkuak Island beaches was dominated by yellowish white sandy substrates type. According to the Ministry of Planning and Development Government of Trinidad and Tobago (1974) these types are very supportive to the development of a marine ecotourism. This is due to the high interest of tourists to enjoy the beautiful sandy beaches.

Cingkuak Island has a tropical climate, which also supports to the development of marine ecotourism. This is caused by the sun can be enjoyed by tourists throughout the day to sunbathe on the beach, especially for some foreign tourists who rarely get sunlight. This is in accordance with the opinion of Young (2010).

Based on the assessment of Cingkuak Island vegetations, sea grass are the primary, which covers 70 % of the island from the species of *Enhalus Acoroides* and *Thalasia Hemprichi*. Coral covers 60 % and almost found on every sides of the island. Mangrove conditions are quite varied from 6 types of mangrove, and are also found the biodiversity fauna and marine biota. This condition has good potential to support marine ecotourism development in Cingkuak Island (Dahuri, 2003).

The Existence of historical Cingkuak Island such as the Portuguese fort, Tomb of Madame Van Khempin and the remains of buildings of Dutch Piers are expected to able to enhance the competitiveness of Cingkuak Island as one of tourist destination in the Sumatera Province. The condition is also supported by the presence of P. Cingkuak it self as an important part in the history of the colonial period in West Sumatera Island. Ownership of the historical sites are able to provide integration between the natural and cultural potential and in Cingkuak Island.

Based on Tourism Actors Perspectives Overview

Analysis of marine tourism actors in Cingkuak Island can be judged from the frequency of tourist visits, the involvement of local communities, businesses and policy makers. In general, the frequency of tourist visits in Cingkuak Island shows positive value, it is showed by significantly increasing of the number of visitors from year to year. Overview perspective on the development of Cingkuak Island can be figured out on Figure 3 - 6. The tourisms actors strongly support the development of marine ecotourism in the island.

Based on SWOT Analysis

The SWOT analysis was basically used to identify the strength and weakness from internal factor and also the opportunity and threat from external factor. These factors will be the primery indicator to design the concept and strategy of Cingkuak Island marine ecotourism development. In general, the result of SWOT analysis showed that Cingkuak Island has a big potential to be a marine tourism destination and possesses a big chance to develop to be marine ecotourism.

The values of SWOT analysis shows that the source of the strength mostly come purely as internal potential, such as natural and beach attraction, biota and ecosystem diversity, and historical values. While the weakness problems are due to the lack of sustainable concept and strategy, the lack of management, the lack of human resources, and also the lack of business creativity. The weaknesses were estimated to be solved by the development of marine ecotourism concept and strategy in Cingkuak Island.

The Value of WTA and WTP

The analysis of marine tourism Cingkuak was based on the values of WTA and WTP which are considered of being very appropriate. The average value of the WTA is IDR. 155.588,00. While the average value of WTP is IDR. 168.500,00-. The value provides a meeting point between the value of people's willingness to offer services to the tourists and visitor service recipients.

Economy Potential Value

The value of the economic potential of marine tourism of Cingkuak Island in 2011 was IDR. potential is considered high and gives significant



effect to elevate the local economy. Thus, based on the value of the economic potential, Cingkuak Island has a high value and suitable to be developed as marine ecotourism.

### **Development Problems and Challenges**

One of the problems that might be arise in the development of marine tourism P. Cingkuak is the issue of environmental degradation. Based on observations at the object of study, governments and local communities still do not have a Marine Tourism Development Master Plan blue print which contained concept and strategy of sustainable development. This condition will increase the chances of failure and possibility to the degradation of environment in the next few years. The damages possibility is not only on the physical environment, but also on the cultural degradation, social conflict and other conflict of interest (Susilo, 2008).

Another challenge on the development of Cingkuak Island marine ecotourism is integrating all stakeholders to achieve a sustainable tourism concept in the dimensions of environmental, cultural and socio-economic (European Commission Tourism Unit, 2000). The parties should be involved in the management of the marine ecotourism include the Central Government, Local Government (Department of Tourism, Department of Marine and Fisheries, Regional Development Planning Board), Local Communities, Travelers, Investors, Non Governmental Organisation, and others who are directly related with the tourism object such as local society (Bjork, 2000).

### **Develop Marine Ecotourism Base**

The concept of ecotourism is a synthesis from the polemic that in one side human have to exploit the resources to get the prosperity, and on the other side people also need to conserve the environment to maintain the sustainability. The concept of ecotourism can take the midpoint of both issues with building a sustainable ecotourism.

Cingkuak Island as one of tourism destination is considered has big potential to develop in sustainable pathway. Through marine ecotourism concept Cingkuak Island would be able to strength the local economy and also would be able to conserve the sustainability of physical environmental, culture, and social.

### **Strategic Steps of Cingkuak Island Marine Ecotourism Development**

#### **Master Plan: Concept and Strategy of Sustainable Development**

Marine Ecotourism development master plan contains the development planning and management synergy to achieve sustainable development. The making process of the master plan has to involve all related stakeholders, such as local government, local community and businesses. The plan consists of the facilities and infrastructure planning to support the visitors comfortable (Kanji, 2006).

#### **Local Communities Involvement**

The involvement of the local communities is one part of the vision of marine ecotourism. Ecotourism basically has three criteria: providing value of conservation, community involvement, and economic value (Tuwo, 2011). Empowerment of local communities is an attempt to facilitation, encouragement or assistance to communities to be able to determine the best choice in the use of natural resources and small islands in a sustainable manner (BPSPL Padang, 2010).

#### **Building Capacity of Local Communities**

Building capacity has the importance role to elevate the awareness, management skill, and creativity to achieve sustainable tourism. With the high capacity the community will be able to be more creative in looking opportunity to achieve their prosperity. So the development of marine ecotourism will be successful from the aspect of environmental, cultural and social-economy.

#### **Apply Zoning System**

The Principles of spatial planning is drawn up a plan to suit to the variety of conditions, potential, issues and problems in the area to avoid overlap and potential damages (KKP and BPSPL Padang, 2010). After observe some multiple variables in Cingkuak Island, there are some recommendation regarding the zoning system.

The western part is suit for resort base and some of tourist attractions; swimming, snorkeling, scuba diving, glass boat and sunbathing. The southern part can be directed to fishing, scuba diving, and other activities. The eastern and western of the island are an area of activities are recommended to control except for it will damage the ecosystem.



#### Adjusting to the Carrying Capacity

The ecotourism considered as a new concept in tourism development to achieve sustainable environment (Garrord and Wilson, 2003). The calculation of carrying capacity is a very important tool to build sustainable tourism. Calculation of carrying capacity of a tourist area will determine the maximum tourist population that can be accepted in order to maintain continuity of nature. If the number of visitors exceeds the carrying capacity of the limit, then there is over-exploitation, the environment would be disrupted, infrastructure and natural biota stress, and the environment will be very risky in the future (Burke and Kura et al. 2001).

#### Enhance Local Communities Creativity

To improve the economic benefit of Cingkuak Island development to be a marine ecotourism object is to improve the competitiveness and creativity of local community in tourism business. The creative economy can be the provision of local handicrafts, local souvenirs which represented the local culture, nature-based accommodation and local culture, and local specialties (Klein, 2003).

#### Research and Conservation Programs

Research and Conservation programs are quit important to the development of Cingkuak Island marine ecotourism development. The conservation can be considered as mitigation that may arise in the location of the object. Conservation programs may include: reforestation of mangroves, coral transplantation, etc.

#### Supervision and Controlling

In the development of Cingkuak Island as a marine ecotourism, supervision became one of the critical factors. Supervision is one of the final stages of the implementation of the management of an area to ensure all meet the plan and the implementation of the plan. It was successfully applied by the French in the form of laws and the rule of law on the balance of natural equilibrium in coastal and marine areas (Miossec, 1993).

### CONCLUSIONS

Cingkuak Island has a big potential in marine tourism destination and possesses a big chance to develop into a marine ecotourism sector. It was showed by the suitability values of marine ecotourism development. The values were resulted through tourism supporting criteria, total scores of WTA and WTP, economic potential values, and SWOT analysis.

Regarding the result of the study, the government or related agencies should follow up the results and recommendations of the study. In addition, further research needs to be done in this area of research, especially regarding the feasibility study, environmental impact assessment, the level of participation of local community, suitability analysis, carrying capacity studies, models and marine development strategy of marine ecotourism.

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