A Model of Sustainable Marine Tourism Development Policy (A Case Study at Libukang Island of Palopo City)

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Abstract. *The Government of Palopo City projects Libukang Island area as one of the marine tourism locations, which is expected to have an impact on the welfare of local communities, the preservation of coastal resources, and the increase on local revenue (PAD). However, said tourism area has not been optimally managed that the utilization of tourism activities are low and it has not contributed to the welfare of the community and its local revenue. From the aforementioned problem, priorities are needed to encourage the development of marine tourism. The objective of this research is to formulate policy priorities for developing marine tourism at Libukang Island. The research methods used were the survey method. The data analyses used were the suitability of tourism analysis to assess tourism potential and the AHP analysis to determine alternative policy strategies for sustainable marine tourism development. The results of this research regarding the potential of marine tourism in the Libukang Island show that index of suitability of the beach tourism of recreation and swimming categories are deemed very suitable (SS). Meanwhile, the indexes for marine tourism of snorkeling and diving categories are unsuitable (TS) because there are limiting factors such as coral cover, coral life forms, and reef fish types. The priority scales of the policy are as follow: (1) improvement of tourism infrastructure; (2) promotion of tourism; (3) zone distribution for fishery and tourism; (4) community-based tourism management.*
Keywords: *Priority Policy, Maritime Tourism, Libukang Island.*

1. INTRODUCTION

Indonesia has wealth and diverse coastal resources that can be utilized for the development and prosperity of its people. One of the potentials for coastal areas owned by our country is the potential for marine tourism. The marine tourism sectors have contributed greatly to foreign exchange for the country in addition to the oil and gas sectors. Another contribution of marine tourism to national development is by providing employment and and gearing economic activities. The problem that occurs is that of so much potential for marine tourism, only a small part is managed and developed properly. The maritime tourism development policy has not been focused and integrated with the ecological, social, economic, and environmental aspects. The development of marine tourism requires extreme caution due to its fragile nature. Management and planning requires cooperation from various involved parties. Marine tourism is a concept of sustainable use of coastal resources in relation with environmental service systems that prioritize coastal natural resources as service objects where the most important thing in this concept is the suitability of resources and the carrying capacity that can support marine tourism activities (Hawkins and Robert, 1997).

Palopo City has tourism potential that can be utilized and there are a lot of tourisms in Palopo City which refer to mass tourism, meanwhile the development of sustainable tourism concept that refers to ecotourism is still in progress. One of the small islands in Palopo City has the potential to be used as a tourist destination is Libukang Island. The island has a diversity of attractions in the form of white sand supported by a exotic natural coastal panorama towards Bone Bay that can be enjoyed by visitors and unpolluted water. Tourism activities that can be

done by visitors on Libukang Island include sunbathing, swimming, playing sand, and fishing. Visitors can access Libukang Island through water transportation facilities in the form of a chartered fishing boat which takes approximately 15 minutes to reach from the Port of Tanjung Ringgit in Palopo City.

Libukang Island has quite a variety of attractions from its existing natural resources. It should be developed into one of the mainstay attractions in Palopo City. But the problem that occurs is the potential for tourism development on Libukang island has not been optimal. (Wahidin, 2009) emphasizes the importance of planning in tourism management because without good planning and control, tourism management only acts the destruction of the tourism development resources themselves. Based on existing problems of limited transportation, information, facilities, infrastructure, as well as management, the development has been stagnant, therefore an alternative policy strategy for developing marine tourism on Libukang Island is developed by considering ecological, social, economic, institutional, and environmental aspects.

2. LITERATURE REVIEW

2.1 Research Objective

The objective of this research is to determine the suitability level of Libukang Island tourism based on the characteristics of the resource potential and to formulate a sustainable marine tourism development strategy.

2.2 Coastal Tourism

Coastal tourism is tourism whose activities rely on the natural attraction of the coastal and marine environment, both directly and indirectly. If the hinter land area is used for settlement, the tourism system developed is categorized as sustainable tourism that pays attention to physical and social carrying capacity (Wong, 1991). Coastal tourism is one of the potential forms to be developed because its tourism activities are carried out in coastal areas, which have quite high biological natural resources and unique natural characteristics with a variety of natural beauty consisting of wild animals, plants, landscapes, and natural panorama, in addition to beach length quantity and physical and visual diversity quality. Furthermore, historical and cultural heritage of the community is also a tourist attraction, both for domestic and foreign tourists (Bjork, 2000). The implementation of coastal tourism will be successful if it fulfills various components related to the preservation of the natural environment, the welfare of the inhabitants, the satisfaction of visitors, and the integration of the community with its development area (Hamdiah, 2004).

2.3 Marine Tourism

Marine tourism is a tourism activity directly related to marine resources, both above sea level and below sea level. The types of activities included in this definition are fishing or sport fishing, snorkeling, diving, and some others (Sobari et al, 2006). (Djunaedi, 2011) defines marine tourism as a recreational activity that includes traveling away from a place of residence to the marine environment. The definition of the marine environment itself is salty waters and is affected by tides.

2.4 Sustainable Marine Tourism Development

The management of coastal areas for marine tourism is inseparable from the use of natural resources for development, where the use of natural resources for development must not damage human environmental governance, must be carried out with comprehensive wisdom, and must take into account the future generations (Reksohadiprodjo et al, 1992). In the management of coastal areas for marine tourism, development activities will remain sustainable if they meet the three prerequisites and carrying capacity of the environment. Firstly, the tourism activities must be placed in biophysical (ecological) locations in relevance with the requirements needed for this activity. In addition, the placement of marine tourism activities should be avoided as far as possible from locations that are already intensively or densely industrialized. Secondly, the amount of waste from tourism activities themselves and other activities discharged into the coastal and marine environment should not exceed the

capacity of assimilation - the ability of an environmental system to receive waste without any indication of environmental pollution. Thirdly, the use of natural resources should not exceed the ability of nature to recover these resources within a certain period (Dahuri, 1996).

3. METHODS

a. Time and Location of Research

This research was conducted at Libukang Island, located in Palopo City, South Sulawesi Province. This research lasted for 2 months, starting in December 2019 until January 2020.

b. Data Collection Method

This research used two types of data, primary and secondary data. Primary data were obtained by conducting field observations through physical observations and interviews with several informants related to the management, development, and use of Libukang Island. Meanwhile, secondary data were obtained through surveys and literature reviews from documented sources from various institutions and governments. Field data collection was done using the method of observation, interviews using questionnaires, in-depth interviews, and documentation. The interview method used questionnaires given to a number of visitors around the tourist area. The depth interview method used interview guidelines and was conducted to stakeholders who were considered to be aware of developments and issues of tourism development in Palopo City.

The data collection methods included oceanography and social data including visitor perceptions which are as follows:

1) Oceanographic
   a) Temperature: to measure the temperature, a thermometer was used.
   b) Current: current speed is measured using the current meter flowact FL-03
   c) Brightness: to determine the brightness level, secchi disk was used. However, since the data obtained were in the form of percent, the data were then divided by depth at the measurement location and then percented, by using the following formula:

$$\text{Brightness (\%)} = \frac{measured\ brightness\ (m)}{depth\ (m)} \text{ x } 100\%$$

   d) Salinity (‰): it was measured using a handrefractometer.

2) Social Data

The social data were collected by conducting interviews using questionnaires, in-depth interviews, and documentation. The choosing of respondents was done by purposive sampling. Purposive sampling is a data source sampling technique with certain considerations that the data sources know the most about what is expected. The number of respondents deliberately chosen in this research was 31 tourists and 9 stakeholders consisting of government, non-governmental organizations, and community leaders. Interview method using a questionnaire was conducted on tourists around the area. Lastly, the in-depth interview method using the questionnaire guideline was conducted on stakeholders.

c. Data Analysis

The data analyses used in this research were as follow:

1) Coral Coverage Percentage Analysis

The analysis coral coverage percentage was done using the Coral Point Count with Excel Extension (CPCe) application. CPCe is a standalone application that can automatically perform random point calculation analysis and is also capable of performing basic substrate calculations of images taken under water.

2) Tourism Suitability Analysis

The determination of the suitability of certain area for marine tourism on Labombo Beach, Palopo City was carried out using the tourism suitability index formula referring to

(Yulianda, 2007) as the following.

$$IKW = \sum_{Ni=1}^{i} \left(\frac{Ni}{Nmax}\right) x\ 100$$

Where:

IKW = tourism suitability index (%)
Ni = i[th] parameter score (weight x score)
N max = maximum score of a tourism category

a) Coastal Tourism

The analysis of coral suitability for tourism was carried out by taking into account the 10 parameters (Table 3) with 3 different classification assessments: very suitable (S1) with IKW 83 - 100%, suitable (S2) with IKW 50 - < 83, and unsuitable (TS) with IKW <50%.

Table 1.
Categories of Coral Tourism Suitability

Parameters	Weight	S1	Score	S2	Score	S3	Score	N	Score
Beach Type	20	White sand	3	White sand little coral	2	Black sand is rocky, a little precipitous	1	Mud, rocks, precipitous	0
Beach Width	15	>15	3	10 - 15	2	3 - <10	1	<3	0
Availability of fresh water (*km*)	15	<0.5	3	0.5 - 0.9	2	>1 - 2	1	>2	0
Water depth (*m*)	10	0 - 3	3	>3 - 6	2	>6 - 10	1	>10	0
Water-based materials	10	Sand	3	Sandy reefs	2	Muddy sand	1	Mud	0
Beach slant (º)	10	<10	3	10 - 25	2	25 - 45	1	>45	0
Brightness waters (*m*)	5	>10	3	5 - 10	2	3 - 5	1	<3	0
Current velocity (*m/det*)	5	0 - 0.17	3	0.17 - 0.34	2	0.34 - 0.51	1	>0.51	0
Coastal land closing	5	Coconuts, open Spaces	3	Low scrub, savanna	2	Tall thickets, forest	1	Mangroves, settlements, harbors	0
Biota is dangerous	5	No	3	Sea urchin	2	Sea urchin, stingray	1	Sea urchin, ray, shark	0

Source : Modification (Yulianda et al, 2010)

b) Marine Tourism

Marine tourism can be grouped into two categories, namely diving tourism and snorkeling tourism. The suitability of marine tourism in the diving tourism category considered six parameters (Table 2) with three different classifications: very suitable (S1) with IKW 83 - 100%, suitable (S2) with IKW 50 - < 83% and unsuitable (TS) with IKW <50%. While the suitability of marine tourism in the snorkeling tourism category considered seven parameters (Table 5) with three classifications: very suitable (S1) with IKW 83 - 100%, suitable (S2) with IKW 50 - < 83%, and unsuitable (TS) with IKW <50%.

Table 2.
Criteria for Coastal Tourism Suitability of Diving Category

Parameters	Weight	S1	Score	S2	Score	S3	Score	N	Score
Brightness waters (%)	5	>80	3	50-80	2	20-50	1	<20	0
Cover of living coral (%)	5	>75	3	>50-75	2	25-50	1	<25	0
Kind of lifeform	3	>12-	3	<7-12	2	4-7	1	<4	0
Species of coral fish (*tail*)	3	>100	3	50-100	2	20-50	1	<20	0
Current velocity (*cm/det*)	1	0-15	3	>15-30	2	>30-50	1	>50	0
Depth of water bed (*m*)	1	6-15	3	>15-20	2	>20-30	1	>30	0

Source : Modification (Yulianda et al, 2010)

Table 3.
Criteria for Marine Tourism Suitability of Snorkeling Category

Parameters	Weight	S1	Score	S2	Score	S3	Score	N	Score
Brightness waters (%)	5	>80	3	50-80	2	20-<50	1	<20	0
Close the coral community (%)	5	>75	3	50-75	2	25-50	1	<25	0
Kind of lifeform	3	12	3	7-12	2	4-7	1	<4	0
Species of coral fish (*tail*)	3	>50	3	30-50	2	10-30	1	<10	0
Current velocity (*cm/det*)	1	0-15	3	>15-30	2	30-50	1	>50	0
Depth of water bed (*m*)	1	1-3	3	3-6	2	6-10	1	>10	0
Flat stretch of rock (*m*)	1	>500	3	100-500	2	20-100	1	<20	0

Source : Modification (Yulianda et al, 2010)

3) Hierarchical Process Analysis (AHP)

This refers to an approach concerning the priority policy analysis in the appropriate spatial planning by structuring an issue as a hierarchy, where the stakeholders are at the highest level because their power to influence the final outcome is the dominant factor. The decision making process is basically having an alternative. The main tool of hierarchical process analysis (AHP) is a functional hierarchy with its main input is human perception, and the hierarchy of complex and unstructured problems is solved into groups that form a hierarchy (Saaty L., 1993).

4. RESULT AND DISCUSSION

4.1 Tourists Perception towards Marine Tourism at Libukang Island

Perception is defined as an individual's sense impression of something that has been or is being experienced both physical (tangible) and non-physical (intangible). According to (Mulyani, 2006) perception is regarded as an internal process that allows a person to choose, organize, and interpret stimuli from their environment where that process can influence the person's behavior. The following are visitors' perceptions regarding Labombo Beach tourism area.

4.1.1. Facility and Infrastructure of Libukang Island

The lack of facilities and infrastructure results relatively small number of visits on Libukang Island, especially transportation and tourist infrastructure. Of 31 respondents who were involved in this research, about 97% said that the facilities and infrastructures are very lacking and 3% of them stated they were lacking. The existing facilities and infrastructure on Libukang Island are wooden docks for ships, mosques, and toilets. Restaurants are not available in the Libukang Island, so visitors must bring their own food.

4.1.2. Transportation Access at Libukang Island

Regarding the transportation access to the tourist sites of Libukang Island, the perception of respondents showed that around 87% respondents said that transportation facilities are very lacking and around 13% stated that transportation facilities are lacking. The data shows that the means of transportation to tourist sites is far from supportive for increasing tourist visits. If tourists want to visit Libukang Island, they must rent a 5PK modified motor boat owned by a local fisherman. In the city of Palopo there is a Bua airport with a capacity that is still limited only for small aircraft and not to mention that flight schedules are only available on certain days. Therefore, to increase local and foreign tourist arrivals, the Bua airport should be expanded so that larger aircraft can land and regular flight schedules are available.

4.1.3. Motivation to Visit Libukang Island

Based on field observations, the visitors' motivation to Libukang Island is to enjoy the beauty of unspoiled and beautiful beach views and they want to rest, recovering their physical condition after working hard, and to find peace of mind. Those motivations, according to (Yoeti, 2010), are included in the Physical or Physiological Motivation for the purpose of relaxation, health, comfort, leisure, and so on.

4.1.4. Community Involvement in Tourism Management

Local community participation is a necessity in developing community-based marine tourism management. Based on the results of interviews with local communities, it is found that 97% of respondents said the local community had not been involved in the management of the tourism. Currently, the management of marine tourism is carried out by the Palopo City Government. The management of Libukang Island as a tourist area must involve the local community. Local people are expected know more about the dynamics of the development issues and they have interests in solving problems that have direct or indirect impact on their daily activities. According to (Tuwo, 2011), the goal of managing marine tourism is the attainment of the welfare of local communities, cultural integrity, and the preservation of biodiversity.

4.2 Water Quality Parameter

Water quality is one of the main determinants in the development of marine tourism. Water quality affects coral growth and diversity of reef fish, which are the main attractions in marine tourism activities. Water quality parameters have a correlation and influence between one another. The quality of the waters of Libukang Island can be seen in Table 4.

Table 4.
Marine Water Quality Parameter at Libukang Island

Parameters	**Station 1**		**Station 2**		**Station 3**	
	3-6 *meters*	7-10 *meters*	3-6 *meters*	7-10 *meters*	3-6 *meters*	7-10 *meters*
Temperature (ºC)	30	30	30	30	30	30
Brightness (%)	62	51	64	53	64	55
Current velocity	0.15	0.18	0.15	0.18	0.21	0.26
Salinity	31	31	31	31	31	31

Source : Primary data processed, 2020.

The brightness of the water illustrates the sedimentation conditions that occur around certain area. In the development of diving and snorkeling tourism activities, the higher the level of water transparency, the better the tourism activities will be because tourists can freely enjoy the beauty of the coral reef ecosystem and diverse reef fishes under the sea with clear

visibility. Based on the results of the measurement at each research station, the level of brightness in the Libukang Island region reaches 51 - 64%. The low level of water brightness reflects high sedimentation that occurs in the Libukang Island water. Current speed is a parameter required in diving, snorkeling and beach tourism activities. Current velocity obtained at the study site is 0.15 - 0.26 m/s and falls to the medium current category.

According to (Sari et al, 2012), slow current category is characterized with speed in the range of 0- 0.25 m/s, medium current category with speed in the range 0.25-0.50 m/s, fast current category with speed in the range 0.50-1 m/s, and very fast current category with speed above 1 m/s. Furthermore, water current also serves to dispel and clean up trash; meanwhile the conditions of strong current can interfere with snorkeling and diving tourism activities. Ideally, snorkeling and diving will be comfortably done on calm water. Likewise with beach tourism, strong currents will disrupt the comfort of tourists who bask in the edge of the coastline.

The water temperature at four observation stations is around 30º C. Temperature parameter is very important which affect the existence of ecosystems in the waters According to (Tuwo, 2011), a good temperature for diving and snorkeling tourism activities is around 23º C to 35º C. Coral reefs and other biota can live in water temperatures above 18º C with optimal temperatures between 23º C and 25º C respectively. The maximum temperature that can still be managed ranges from 35º C to 40º C. Salinity at the observation site is around 31 ‰. Based on sea water quality standards for marine tourism activities ranging from 30 to 35 ‰, it can be concluded that salinity in the water of the Libukang Island is suitable for marine tourism activities. According to (Dahuri, 1993), in general coral reefs can grow well in the salinity of 30-35 ‰ in coastal areas.

4.3 Tourism Potential At Libukang Island

Libukang Island is projected to become a mainstay tourist area in Palopo City. This island is located 2 km from the center of Palopo City and can be reached in about 20 minutes from Tanjung Ringgit Harbor by using a 5 PK temple motor boat. This island has a white sandy beach with an area of about 17,800 m2 compelled with a natural panorama of the beach which is quite exotic towards the bone bay. The beach on Libukang Island has a low slope of 7-11º. According to (Setiawan *et al*, 2016), a 3-30º beach slope level is still suitable for beach tourism activities. The results of the beach tourism suitability index (IKW) on Libukang Island ranged between 81.66-86.66% which are included in the very suitable category (S1). The highest tourism suitability index value can be found at station 1 and station 3 with IKW value of 86.66%, and station 2 with IKW value of 81.66%. The parameter that has the highest weight to determine the suitability index for coastal tourism is beach type and beach width. This is because these two parameters are considered the most important for recreational tourism activities of the coastal category.

Table 5.
Results of the Suitability Assessment of Libukang Island for Coastal Tourism

Parameters	Criteria			Weight	Score			Total Score		
	ST 1	ST 2	ST 3		ST1	ST2	ST3	ST1	ST2	ST3
Beach Type (*m*)	White sand little coral	White sand little coral	White sand little coral	20	2	2	2	40	40	40
Beach Width (*m*)	>15	10-15	>15	15	3	2	3	45	30	45
Availability of fresh water (*km*)	<0.5	<0.5	<0.5	15	3	3	3	45	45	45
Water depth (m)	0-3	0-3	0-3	10	3	3	3	30	30	30
Water-based materials	Sandy reefs	Sandy reefs	Sandy reefs	10	2	2	2	20	20	20
Beach slant (º)	7º	7º	10º	10	3	3	3	30	30	30

Brightness waters (%)	53	53	60	5	2	2	2	10	10	10
Current velocity (m/det)	0.15	0.15	0.18	5	3	3	3	15	15	15
Coastal land closing	Shrub	Shrub	Shrub	5	2	2	2	10	10	10
Biota is dangerous	No	No	No	5	3	3	3	15	15	15
Total				**300**				**260**	**245**	**260**

Source : Primary data processed, 2020.

The marine tourism suitability index score of the snorkeling category at station 1 is 30%, station is 26.66%, and at station 3 is 38.33%. These results indicate that the Libukang Island water area falls into the unsuitable category (TS). Those low indexes become limiting factors for the suitability of snorkeling tourism. Parameters that are still minimal and become a limiting factor are coral coverage, coral life forms, and species of reef fish. These three parameters can still be improved in quality so that they are no longer serving as limiting factors by transplanting coral reefs. According to (Yunus et al, 2013), the transplanting aims to increase coral reef cover and the number of life forms. The results of the suitability assessment of marine tourism in the snorkeling category can be seen in Table 6.

Table 6.
Results of the Suitability Assessment of Libukang Island for Snorkeling Tourism

Parameters	**Criteria**			**Weight**	**Score**			**Total**		
	ST1	ST2	ST3		ST1	ST2	ST3	ST1	ST2	ST3
Brightness waters (%)	62	64	64	30	1	1	1	30	30	30
Close the coral community (%)	0.53	0	6.47	20	0	0	0	0	0	0
Kind of lifeform	4	0	10	20	0	0	1	0	0	20
Species of coral fish (*tail*)	12	2	19	10	1	0	1	10	0	10
Current velocity (*cm/det*)	0.15	0.15	0.21	10	3	3	3	30	30	30
Depth of water bed (*m*)	5	6	3	5	2	2	3	10	10	15
Flat stretch of rock (*m*)	>100	>100	>100	5	2	2	2	10	10	10
Total				100				90	80	115

Source : Primary data processed, 2020.

The results of tourism suitability index analysis for diving category at station 1 and station 2 is at 35%, while station 3 is at 46.66%. These results indicate that the area of Libukang Island water for diving tourism activities is included in the unsuitable category (TS). Similar to those of snorkeling category, some parameters are still acting as limiting factors for diving category. Parameters that are still minimal and become a limiting factor are coral cover, coral life forms, and species of reef fish. The right strategy in restoring the condition of damaged coral reefs is by transplanting coral reefs and increasing the law enforcement on various activities that can damage coral reefs such as bombing coral reefs and catching fish using potassium. The results of the suitability assessment of marine tourism in the diving category can be seen in (Table 7).

Table 7.
Results of the Suitability Assessment of Libukang Island for Diving Tourism

Parameters	**Criteria**			**Weight**	**Score**			**Total**		
	ST1	ST2	ST3		ST1	ST2	ST3	ST1	ST2	ST3
Brightness waters (%)	51	53	55	30	2	2	2	60	60	60
Close the coral community (%)	1.6	0	9	20	0	0	0	0	0	0
Kind of lifeform	1	0	7	20	0	0	1	0	0	20
Species of coral fish (tail)	5	3	23	15	0	0	1	0	0	15
Current velocity (cm/det)	0.18	0.18	0.26	10	3	3	3	30	30	30
Depth of water bed (m)	8	8	10	5	3	3	3	15	15	15
Total				100				105	105	140

Source : Primary data processed, 2020.

4.4 Tourism Development Policy at Libukang Island

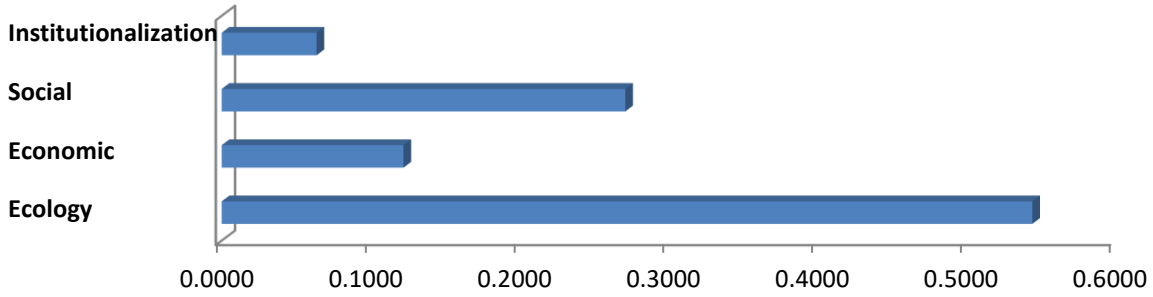
The main existing problems in the management of marine tourism on the Libukang Island are (1) the lack of supervision in term of the use of natural resources in the tourist area of the Libukang Island; (2) the lack of facility and infrastructure to support marine tourism; (3) the low ability of the community in managing marine tourism activities. As consequences, those problems have impact; (1) damaging the environmental and natural resources on Libukang Island; (2) slowing economic growth; (3) contributing to marine tourism attraction not optimally. The program for the selection of development strategies for the Libukang Island Tourism Area is carried out through a hierarchical process analysis (AHP) by synthesizing relative interests between elements in the form of criteria and alternative policies.

4.4.1. Criteria Analysis of Marine Tourism Development Priority

The development of tourism areas into integrated tourism areas has several strategic implications, some of which are in form of additional local revenue (PAD), improvement of welfare for surrounding communities, and resources perseverance. The development strategy must consider various important factors such as ecological, economical, social, and institutional by taking into account the opinions of stakeholders involved in the development of Libukang Island tourism in Palopo City, ranging from local government, certain group, and the community. In determining the choice of developing sustainable marine tourism on Libukang Island, pairwise comparisons are made on each ecological, social, economical, and institutional criteria.

Based on the results of the AHP analysis, ecological criterion is the first priority in the development of marine tourism on Libukang Island, then the second priority is the social criterion, the third priority is the economic criterion, and institutional criterion is the fourth priority (Figure 1).

Figure 1.
Priority Criteria for Marine Tourism Development in Libukang Island



Source : Primary data processed, 2020.

Ecological criterion (priority 1) is biophysical requirement that must be met so that tourism activities can be supported by the environment. Ecological criterion includes the attributes of coral reef, aquatic biota, and water condition, Social criterion (priority 2) is requirement for social and cultural benefits that must be met in order to make sustainable use of resources. This criterion includes the ease of reaching tourist sites and the absorption of local workforce. Economic criterion (priority 3) includes aspects of marketing and aspects of economic value. It includes the attributes of local revenue (PAD) and community income. Institutional criterion (priority 4) is the requirement in the sustainable management and development of tourism. It includes the attributes of a community empowerment program as well as the establishment of regional regulations regarding the development of Libukang Island.

4.4.2. Strategy Analysis of Marine Tourism Development Priority

The overall results of the hierarchical process analysis (AHP) with ecological, economical, social, and institutional criteria obtained that the priority strategy for developing marine tourism on Libukang Island are as follows:

1. Improvement of Tourism Infrastructure (Priority 1)

Provision of infrastructure such as access to transportation is the core of tourism activity. The availability of infrastructure greatly influences the marine tourism development in an area. Therefore, improving tourism infrastructure is the first priority for marine tourism development on Libukang Island. This alternative policy is a solution to the problem of lack of interest of tourists for coming to Libukang Island. With the construction of tourism facilities and infrastructure, it is expected to increase the tourist interest to visit Libukang Island. In addition, the development will absorb labor for the community around Libukang Island and improve their welfare.

In providing such facility, the local governments should cooperate with the private sector to provide appropriate and safe sea transportation to reach tourism areas. As for attracting domestic and international tourists, it is time for the Palopo City Government to expand the Bua airport, which has limited capacity (only for small aircraft), so that larger aircraft can land at the airport. Therefore, flight schedules which are usually available on certain days can be scheduled every day. According to (Tuwo, 2011), by improving transportation service, it is expected to facilitate access to tourism areas and hence accelerate the growth of regional development.

2. Tourism Area Promotion (Priority 2)

The factor that hindered the development of tourism in the Libukang Island Region is the lack of promotion done by the Palopo City Government. In promoting; it is limited to making brochures/pamphlets. This is, according to the observations of researcher, considered ineffective so that the results are not optimal. Therefore, there is a need for other innovations that can promote the Libukang Island Tourism Area so that it can attract both local and foreign tourists. One of the promotion strategies that ca be used is through social media such as Facebook, Instagram, and creating a website about Labombo Beach tourism. According to (Wahyudi, 2014), one of the strategies in promoting tourism so that the tourist area is known by the wider community is to utilize social media.

3. Zone Distribution for Tourism and Fishery (Priority 3)

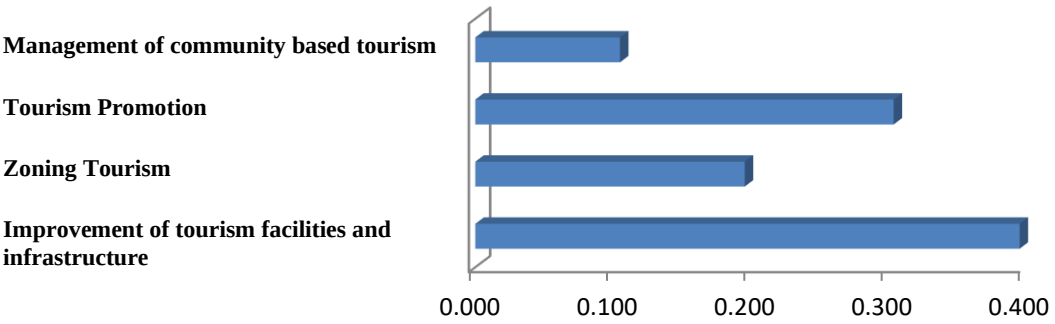
The coral reef ecosystem in Libukang Island suffers damage caused by destructive fishing activities. Thus, the carrying capacity of the environment, especially the coral reef environment, which is a tourist attraction for snorkeling and diving, is in declining condition. Therefore, the marine tourism development needs to be based on a zoning system of various forms of utilization and ecological principles. In other words, the zoning of utilization is needed, such as utilization for the benefit of conservation, the interests of local communities, and the interests of ecotourism. On that basis, it is necessary to clear zones for the purpose of tourism and fishery activities.

4. Community-Based Tourism Management (Priority 4)

The decision to involve communit for the sake of marine tourism management on the island of Libukang is the right choice, given limited government employees and operational funds for tourism sector. Community participation in tourism management is very important, bearing in mind the purpose of management is to achieve community welfare, cultural integrity, biodiversity conservation, and other supporting systems. Communities are no longer placed as objects that only accept everything that is decided from the government, but they need to be involved in the framework of tourism development. Community involvement in the development of tourism raises a feeling of belonging and willing to participate in tourism development. For optimal management, it must be adapted to the concept of co-management approach. Co-management is the concept of joint management where stakeholders agree on

mutual roles in the management, rights and responsibilities of an area or natural resources with the main objective of making management more precise, efficient, fair and equitable. Through this co-management process, it is hoped that a strong and harmonious stakeholder coordination process consisting of the community, nongovernmental organizations, entrepreneurs, and the government will be built. The scale of priority strategies for developing the marine tourism area of Libukang Island can be seen in (Figure 2).

Figure 2.
Priority Strategy Scale of Marine Tourism Development on Libukang Island



Source: Primary data processed, 2020.

CONCLUSION

Tourism facility and infrastructure on Libukang Island are still inadequate, especially its transportation access. Therefore, the level of tourist visits on Libukang Island is still relatively small. Furthermore, Libukang Island tourism management has not involved local community. The coastal area of Libukang Island is very suitable (SS) for beach tourism activities. Tourism objects in the form of white sand beaches and natural panorama of the beach which is quite exotic towards the bane bay become the main attraction for tourists. As for marine tourism activities in the water of Libukang Island, such as snorkeling and diving, they are included in the unsuitable category (TS) due to limiting factors such as coral cover, number of coral life forms, and types of reef fish. The strategy of marine tourism development on Libukang Island based on the hierarchical process analysis (AHP) revealed that the first priority is the improvement of marine tourism infrastructure, the second priority strategy is the promotion of tourism areas, the third priority strategy is zone distribution of fishery and tourism, and the fourth priority strategy is community-based tourism management.

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