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Pal Beach Tourism Development in Marinsow Village, North Minahasa Regency

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Abstract

This study aims to identify the potential of Pal Beach tourism attraction, identify individual infrastructure and attraction facilities of Pal Beach, and reviewing tourism development of Pal Beach. This research was conducted in the village of Marinsouw, North Minahasa Regency for six months from April to October 2016. This study used a qualitative description. The results on the development of Pal beach tourism object showed that 1). Accessibility (affordability); driveway access to the Pal coastal resorts is damaged and needs to be repaired by resurfacing and widening the road. 2). Attraction; in this case is the cultural attraction that is religious tourism such as Tulude culture which is a tradition of rural communities of Marinsouw on every January 31st should be developed and packaged in a tour package to attract foreign or domestic tourists to more frequently come to the village of Marinsouw and the Pal beach. 3) Amenities (facilities/comfort); there is a needs to build an inn or a cottage accommodation in Pal coastal region, tourism information facilities are necessary to hold art and culture of Marinsouw rural communities, souvenir shops, restaurants, sanitation of toilet, and recreation attraction for entertainment. 4). Ancillary Services (institutional services and promotions); need to be made marketing and promotional information systems of Pal beach tourism with the full support of the Government in promoting Pal beach attraction. Recommendation of this study, the first for North Minahasa Regency Tourism Office is: a). North Minahasa Regency Government through the Department of Tourism and Cultural needs to make a MoU with the state-owned enterprises to build Pal beach attraction. It is a pity if the potential of Pal beach is not developed and promoted as a tourism destination area; b). Need to restructure and mapping the Pal coastal tourist area unit. c). Attract investors to build tourism supporting facilities such as accommodation, tourism information center, souvenir shops, special attraction; d). Prepare human resources in the field of hospitality and tourism attractions to manage Pal beach; e). Increase counseling and training in preparing resources for the development of Pal beach tourism object; and the second for Marinsouw Rural Community is: a). Preserving cultural customs Tulude as a tourist attraction to be promoted; b). Make Masamper dance attractions on certain days in Pal coastal resort; c). Manage local products such as *Goroho* banana chips, cassava chips, skills for making plastic flower stalks as typical souvenir from Marinsouw village to raise the family economy; d). Raise awareness in maintaining the security and cleanliness around Pal coastal resorts.

Keywords: Attractions, Development, Pal Beach.

INTRODUCTION

The success of the government in promoting North Sulawesi as one of tourism destinations is evidenced by the large number of foreign tourists who are dominated by Chinese travelers. Press Release Data from North Sulawesi No. 65/10/71/Th.X, October 3rd 2016 [1], tourism in North Sulawesi experienced rapid growth in August. Total tourists who came to North Sulawesi through the entrance to Sam Ratulangi airport in August 2016 were as many as 7,904 people, an increase of 2.96% compared to July 2016 amounted to 7,677 people. When compared with foreign tourists who visited in the previous year as many as 2,247 people in August 2015, foreign tourist visits increased by 251.76% (Table 1). This proves that tourism in North

Sulawesi has become known at the international level.

Table 1. Foreign Tourist to North Sulawesi in August 2015

Country	Number of Visitors	Percentage (%)
China	6,455	81.67
Singapore	229	2.90
Germany	154	1.95
Japan	130	1.64
Hong Kong	129	1.63
USA	115	1.45
Netherlands	85	1.08
UK	80	1.01
Australia	72	0.91
Malaysia	51	0.65

Source: Statistic Center of North Sulawesi [1]

The increasing number of tourists coming to Manado, North Sulawesi should be followed with the development of adequate infrastructure and tourism facilities needed by tourists. It also need public awareness in conserving nature tourism as a form of support for the government's program in developing tourism in the region. It must be improved as a result of tourism itself and

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improving and enhance the economy, especially the local economy.

Pal beach in the village of Marinsouw, East Likupang District, North Minahasa Regency, has the charm of a very beautiful beach and the main attraction for every visitor who comes. Its name is unfamiliar because this exotic beach is still relatively new, having been opened to the public only in 2015. Since February 2015, the beach was crowded with hundreds of visitors who come from various regions in North Sulawesi. The beauty of white sand is an attraction for local tourists to come to visit Pal beach. It is not exaggerating that a few visitors call this beach heaven, new hidden beach in North Sulawesi. Even some visitors compare this beach to Kuta beach in Bali. Based on the recognition of Marinsouw villagers that guard the Pal Beach, on weekends or holidays, Pal Beach can be visited by about 5,000 people whereas, formerly Pal beach was deserted from visitors except the villagers themselves.

From observations and interviews with local people, we found that the number of peak crowds were in the month of February 2015 until October 2015. In November 2015, the number of visitor began to decline gradually until the beach was devoid of visitors in August 2016. If the number visitors could reach 5,000 persons a day now there are only 10 to 30 people a day on weekdays. On the holiday, Pal beach is visited by about 300 people coming from North Sulawesi region who want to travel with family, friends or spiritual travel. The people's income decreased drastically. Usually they got 3-7 million a day, which means an increase in people's income by 80% decreased to 300 thousand a day.

Entrance retribution of Pal beach is managed by the village government to pay janitors and coastal security. Retribution issued is Rp. 10,000 per car and Rp. 5,000 per motorcycle. Retribution of entrance to Pal beach is a contribution to the local revenue (*PAD*) managed by the village government of Marinsouw beginning in February 2015. Each week, the number of vehicles increased from 1000-3000 vehicles with total revenues of about 10-12 million spent for cleanliness and security around the Pal beach. From 2015 until February 2016, the number of visitors decline gradually so that the effect on the amount of revenue from the retribution of entry was about 1-2 million per week.

The decline in the number of visitors to Pal beach occurs because to go to the Pal beach resort, the road about 2.5 km is severely

damaged and stony causing long traffic jams when more visitors come. The local community regret that it has not received any attention from the government of North Minahasa Regency. Infrastructure of tourism is all the facilities that allow the tourism facilities to survive and thrive thus it can provide services to satisfy the diverse needs of travelers [2]. The amenities include a road or driveway to the attractions. Besides the lack of tourism attractions as well as the availability of supporting facilities such as places for selling tourist souvenirs, tourism information facilities and so forth.

A tourism destination, should cover five important elements to allow tourists to feel satisfied in enjoying the tour which includes: 1) Attractions; covering the natural beauty, climate and weather, culture, history, ethnicity or tribal nature, and accessibility to specific place. 2) Facility. 3) Infrastructure; include the system irrigation/water, supply of electricity and energy, communication networks, drainage system, health services, and 4). Transport and 5). Hospitality [3].

Pal coastal tourism development is expected to increase the return visits of local and foreign tourists in order to revive the economy of rural communities of Marinsouw as tourism players around Pal coastal resorts. In this case, the government should immediately go to the beach to improve access to Pal, so the beach resort has greater appeal, so it will able to bring back more visitors, thus have a direct impact on local revenue (*PAD*). Development as a strategy used to promote and improve the condition of an object of tourism and attractions that can be visited by tourists as well as to provide benefits to the community around objects and attractions as well as for the government [4]. The aim of this study is to identify the potential of Pal Beach, identify the facilities and infrastructure in the area of Pal Beach and assess the potential development of Pal Beach attraction.

RESEARCH METHOD

This study was conducted for six months from May to October 2016 in Marinsouw Village, Regency of North Minahasa. This study used a qualitative descriptive analysis technique to give review or interpretation of obtained data so that it becomes clearer and more meaningful. The process of data analysis performed in this study using a model developed by Miles and Huberman [3], better known as an interactive model. This analysis model through the following processes:

1). data that have been collected are reduced in the form of the main points of the research findings that are relevant to the research, and then presented in a narrative, 2). Data reduction and data presentation are the two components of the analysis performed in conjunction with the data collection process, 3). The next process is the conclusion, carried out during the collection process, which is done after the data are presented, described, then given meaning by logical interpretation.

This analysis is a process of interaction between the three components of the analysis with data collection, and is a cyclical process until the research activities completed. Stages of the research processes can be seen in Figure 1. Analysis of tourism development is based on the concept of Pal beach 4A, namely the Attraction, Accessibility (affordability), Amenities (or comfort), and Ancillary services (institutional services and promotions) [4].

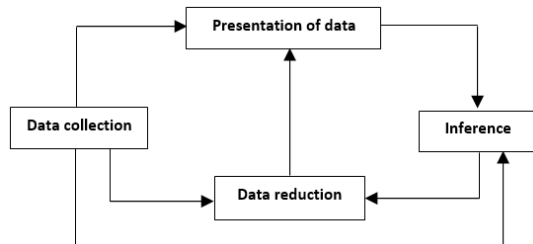


Figure 1. Model Interactive Analysis [3]

RESULT AND DISCUSSION

Identification on Potential Attractions of Pal Beach

As can be seen in Figure 2, Pal beach which is located in the village of Marinsouw, Likupang East District, North Minahasa Regency has incredible beauty beach scenery. This beach name sounds quite unfamiliar, but its beauty is unquestionable.

When entering this beach, tourists will be welcomed with a string of gorgeous white sand that extends approximately 100 meters on the shoreline. It is coupled with the cool air because of the shady trees growing around the beach. The crystal clear sea water adds its own charm. No garbage or the like as far as the eye sight. The waves on the beach looks like a roll of white paper. Some visitors seemed stunned witness the beauty of God's creation. The conditions are like this seems to imply that this beach location has not been touched by human. It does not seem too much when there are few visitors who call this Pal coast a new hidden 'heaven' beach in North Sulawesi and even some visitors compare

this beach to Kuta beach in Bali [5]. Since the position of this beach faces east and is supported with a beautiful panorama, the beauty of the sunrise on the beach will look more beautiful for those who like to hunt sunrise (Fig. 3).

In addition to the stunning beaches, Pal beach is also home to the turtles that are about to spawn in the heap of white sand. After hatching, the tiny turtles will emerge from the sand and walk towards the beach. These turtles will be maintained as one tourism potential of Pal beach (Fig. 4).

Pal beach has a natural charm of underwater beauty of colorful coral and small fish in various forms to make Pal beach one of the attractions for tourists who have a hobby of diving. Besides, there is a *Burung* Cape round Pal beach. There are many government's plan for mangroves and the Marinsouw village to be developed; as mangrove tourism attractions that can support Pal beach.



Figure 2. Pal Beach (source: Telusur Indonesia 2015)



Figure 3. Sunrise at Pal Beach (source: Telusur Indonesia 2015)



Figure 4. Turtle Hatchling at Pal Beach (source: Telusur Indonesia 2015)

Identification of Infrastructure and Facilities in Pal Beach

One of the objects in tourism marketing deals with the infrastructure that supporting the tour. Among others are Recreative and Sportive Plan, and Residential Tourist Plan [6].

Restaurant

Restaurant is one of the important supporting facilities for tourism activities. The restaurant in the area of Pal beach has food stalls made of bamboo with a simple shape that does not provide the main menu foods such as rice and side dishes, but only provides snacks such as fried bananas, boiled instant noodles, coffee, and a variety of cold drinks and snacks. There are only seven stalls in Pal beach area (Fig. 5).



a



b

Figure 5. Public Restaurant at Pal Beach. a) the bamboo stalls, b) inside the bamboo stall. (source: personal documentation)

Souvenir Sales Sites

In a well-developed tourist area, there are many places selling souvenirs for tourist. As with Pal beach, because the attraction is still relatively new, it does not provide souvenir sales facilities in Pal coastal resort yet. However, local products from Marinsouw village such as *Goroho* bananas can be found at food stalls around the tourism area. Other local products such as banana chips, cassava chips are not yet processed by the local community to serve as an souvenir for visitors because of the poor knowledge of the local

product package.

Entertainment Facility

Pal beach is a tourism attraction that has a beautiful beach which is very charming. A stretch of white sand and crystal clear sea water into one of the amusement rides for visitors to bathe and swim at the beach, also with the sun while enjoying the natural beauty of Pal beach (Fig. 6).

Aside from being a family recreation place, Pal beach also has water sport facilities such as banana boat and donut boat with the rental price of Rp. 25,000 per person. Visitors can take advantage of a banana boat and donut boat to tour around Pal beach for 30 minutes with a speed adapted to the demand of visitors as shown in Figure 7.



Figure 6. Pal Beach for Family Recreation (source: Telusur Indonesia 2015)



Figure 7. Water sport in Pal Beach (source: Telusur Indonesia 2015)

Clean Water Supply

Clean water in Pal coastal region is drilled well water taken from the village area. The water transported with a pickup and put into 600 L and 1100 L barrels. Each 600 L sized water barrel is charged Rp. 50,000 and and each 110 L sized water barrel is charged Rp. 85,000. Clean water is used for the needs of cooking, rinsing and toilet. Need for clean water in Pal coastal areas is provided in accordance with the number of visitors. Currently, Pal beach is crowded, requiring more than one barrel with the size of 600 L.

Sanitation Needs

Facilities for sanitary purposes such as public toilets, provided by the food stall owners in Pal coastal area with a total of 14 toilets. Visitors

who use the toilet are charged Rp. 2000 for urination and Rp. 5000 for defecation. In addition to public toilets, there are rented rinsing facilities also available for visitors who bathe on the beach at a price of Rp. 5,000 for each bucket. Public toilet facilities and the rising place are still far from the standard of tourism because it is built using the sack or tarp as a cover walls or rooms. But some are already built semi permanently.

Trash can

Pal beach areas provide 120 bins. It can be seen from the cleanliness that is displayed when you enter Pal coastal areas you will see no garbage spread, as janitors are paid by the village government. The payment using the fund taken from the retribution in Pal beach area with awareness and full responsibility to maintain the cleanliness of the beach and the coastal area.

Access Road

The entrance to Pal beach area is still inadequate, despite being paved with paving standards. But in a few months later, it is found a lot of broken asphalt resulting in holley and rocky road (Fig. 8). This is an obstacle for visitors who have a desire to enjoy the beauty of the Pal beach. Many visitors complained reasonably about access to the Pal beach which is 2.5 km from the village. During holiday season and national holidays, Pal beach is crowded causing long traffic jam when you enter Pal beach area. It is also the cause of the declining number of visitors who come to the Pal beach.



Figure 8. Access Road to Pal Beach (source: personal documentation)

In February 2014, at the beginning when Pal beach began to be known by the people of North Sulawesi, the number of visitors who came reached 5000 people in every holiday [7]. However, due to the damaged access road, the numbers of visitors drastically decreased to only about 300 visitors. The decline in the number of visitors also given the economic impact on society who trade in the tourist area around the Pal beach. In the peak season, income of the

people can reach Rp. 7 million per day, but has decreased to Rp. 300 thousand per day. This problem is particularly regrettable by the community.

Parking and Other Supporting Facilities

Pal beach area has a spacious parking area so that the visitors do not need to wonder around to get a parking spot as shown in the Figure 9. In Pal coastal resort, there are a number of gazebo with three sizes: large, medium and small built by the government of North Minahasa Regency. This gazebo (Fig. 10), besides used as a family resting place, is also used for Christians worship places who do beach tourism worship. Gazebos for rent with various prices, as in Table 2.



Figure 9. Parking Area in Pal Beach (source: personal documentation)



a



b



c

Figure 10. Gazebo in Pal Beach. a) small gazebo, b) medium gazebo, c) large gazebo. (source: personal documentation)

Table 2. List of Price and Total Gazebo

No	Form	Amount of gazebo	Price per gazebo (Rupiah)
1	Large	7	300,000
2	Medium	4	200,000
3	Small	140	100,000
Total		151	

Source: Village Government of Marinsouw

Tourism Development of Pal Beach

The development of a tourism object is related to the advantages of a destination that can be a tourism attraction for a visit [8]. It is seen from the offered products such as attractions, facilities, and access. These products become a magnet for tourists who create the impression that can make them revisit the area [9].

The study on the development of a superior tourism destination should be seen from 4 main aspects (4A), namely attraction, accessibility, amenity and ancillary [4]. Attraction, related to what to see and what to do. The attractions are the beauty and uniqueness of nature, the culture of the local community [10]. Problems facing by accessibility are related to the travel distance and forest road quality.

Ijen craters have three important aspect in competitiveness tourism aspect, namely something to see (mountain landscape), something to do (trekking, hiking, bird watching), and something to buy (meals) [11]. Amenity is all the supporting facilities that can meet the needs and desires of tourists while in the tourism attractions. Amenity for tourism includes accommodation, restaurant, health infrastructure, bank and other aspects supporting tourism business. The availability of amenity instrument was important to the destination [12].

Ancillary is the availability of an organization that can manage tourism attractions, such as making promotions, regulations and so on that can benefit the government, surrounding communities, and other stakeholders [13]. The study of coastal tourism object development, when viewed from the possessed advantages based on 4A aspects above, it can be explained as follows.

Accessibility (affordability)

Accesibility is a general term used to describe the degree to which a product, devise, service, or environment is available to as many people as possible. It is entire transportation system comprising of routes, terminals and vehicles. To

be able to get to the Pal coastal resorts, we must use a private vehicle, motorcycle or rental car. Public transportation such as buses or public transportation is not available. This is due to the access road to the Pal beach tourism attraction is damaged and rocky and the road conditions are wavy. When the rainy season, the road to get to the location will be slippery while the width of the existing road is only about ± 4 m, so it would complicate the tourists especially those using cars. If two cars met in the opposite direction. It will cause congestion. Because many tourists complained about this problem, it resulted in decreasing the number of visitors to Pal beach in November 2015 and affected incomes of tourism actors around Pal beach.

Troubleshooting for Pal beach entrance is to re-increase the number of visits to the Pal beach. Thus the government must fix this by asphaltting and widening the road along the way to Pal beach. Pal beach has a parking area that is wide enough so that the tourists do not get difficulty in finding a parking space.

Attraction

Natural Attraction

Naturally, Pal beach can display a view of the beautiful beaches with charming white sand. Pal coast has cool natural climate, with tiny turtles out of the white sand as a natural attraction that makes a uniqueness to the coastal resort. Mangrove plants which are located around the coast also make Pal beach increasingly rich in natural beauty.

Cultural Attraction

Marinsouw rural communities is a mix of Sangihe, Talaud, Gorontalo and Minahasa Tribes that rich with cultural and religious attractions. They also has a very strong majority embrace in Christianity. The art cultural festival is annually conducted on January 31st called *Kunci Taan* which means closing the series of events and events in the previous year, in the form of *Tulude* religious tradition. *Tulude* tradition displayed *Masamper* dance that symbolizes fellowship and worship to God. *Masamper* is a dance that is accompanied with Christian hymns. *Masamper* dance performed by men in a group consisting of 15-20 persons. With a chorus paired with dance movements, it makes *Masamper* interesting to be seen. Every August 18th, they celebrate anniversary of the village by conducting *Masamper* festival. Besides *Masamper* dance, *Ampa Wayer* dance is a typical dance of Sangihe tribe which also performed.

Marinsouw village's indigenous culture is not yet packed in a travel package as religious promotion to attract more foreign domestic tourists to come to Marinsouw village and Pal beach. *Tulude* culture package with professional management were expected to increase the local revenue and support the local economies [14].

Special Types of Attraction

Special attractions such as cultural stage and arts stage performances do not exist in Pal coastal areas because of lack of resources to design the attractions of tourism as part of a package that can be promoted. The average level of education in Marinsouw Village is dominated by high school graduates (158 persons) followed by university graduate (13 persons). There is a need for cooperation with the regency government to bring in professionals for providing education or training to the youth to manage cultural arts of Marinsouw village as one of the Pal coastal tourism attractions. The performance of the show should be supported by well-organized stage management, from before until after the show [15].

Amenities (facilities/comfort)

Accommodation

Pal beach tourism area did not have perfect base such as hotels or cottages. The distance between Pal beach and Manado as a gateway to North Sulawesi tourism is 57.4 km and takes about 1 hour 31 minutes. This emphasize that the development of coastal tourism should be supported by an adequate accommodation facilities for tourists who want to stay in a few days to enjoy the beauty of Pal beach. The government also needs to attract investors to build hotels in the tourism area of Pal beach. Provision of adequate accommodation facilities makes Pal beach attraction have a high sale value and promotion in order to give economic benefits for the rural life of communities of Marinsouw, and increase the people's living standards and job opportunities. In addition to hotels, home residents can also be used as a homestay for tourists, which if managed properly will improve the welfare of local communities. homestay can be a new business opportunity for local residents [16].

Restaurant

Pal beach tourist area needs permanent restaurants as a supporting tourism facility. The restaurants need to be located based on the group of Tourism Region Unit. A unit of the

tourist area is an area that has centers of tourist activities and has a circuit connection or travel lane. The stall that used as a place to sell food now has no uniqueness and appeal for tourists to eat. The tendency of local tourists visiting the beach to bring their own food and to be enjoyed in rented gazebos. The food is sold only in the form of snacks and traditional snacks such as fried bananas, fried sweet potatoes and so forth. The uniqueness of coastal restaurants model can be used as a destination tourism destination [17].

Water and sanitation

In the development of Pal beach tourism, availability of sanitation such as clean water and sanitation, and also public toilets should be constructed and organized by tourism standards. The public toilets are permanently built for the convenience of visitors as users. There should be a drilled well at certain point as a place to take clean water for sanitation needs in Pal coastal resort so that the process of sanitation and waste disposal can be managed and well ordered. The development of a tourism attraction needs water sources that will be used to support tourism activities [18].

Trash can

Although Pal beach area provide 120 bins that were distributed in various places, the trash bins does not separate the plastic waste, dry waste, and the restaurants waste. In Pal coastal tourism development, the trash bins need to be managed properly by providing bins for plastic, dry waste and food waste with a label so that visitors will throw the garbage in the correct type of waste. Waste that is not managed properly will cause environmental pollution impact and affect the cleanliness and comfort of the tourism area. The waste management system in the tourism area becomes very important to manage the waste management generated around the tourism sites. Waste management covers the management of organic waste and inorganic waste. Organic waste management can be done through composting for trees around tourist areas and utilization of waste as biogas for the driving of creative industries. Inorganic waste management can be done through recycling waste into products with higher value, such as handicrafts or other similar products [19].

Souvenir Sales

Pal beach area needs to build souvenir shop that provide handicraft and typical food of local community to take home as souvenirs. Stalls

must be arranged in units of the tourism area so visitors can easily get souvenirs.

Sport tourism

Pal beach features sports tourism such as banana boat and donut boat. In this cases the need for additional recreational facilities that are more creative and challenging as selling points that can be promoted for coastal tourism destinations. Although tourism sport is only a supporting facilities for the tourism, but it can be something interesting and greatly demanded when its availability is managed properly. Good management and development of marine and coastal-based sport tourism could made a significant contribution to both tourism and sport development for the region [20].

ATM facility

In the development of Pal coastal resorts there is a need to provide financial facilities such as ATM that was built next to the restaurant and guarded. This includes important facilities for visitors who do not take cash when visiting Pal coast, while the activities of tourism include buying and selling in Pal coastal resorts.

Health facility

Health facilities are also needed in the development of Pal coastal resorts. Based on the existing data of health facilities, there only one health center in Marinsouw village with one doctor. There is also a *posyandu* (integrated service center) managed by Marinsouw village community. Health facility was provided to support community needs to meet basic health standard and diseases problems. It includes city hospitality, public health service in each district (Village Health Center, Village Health Sub-Center, and Village Health Post), and drug store. However, the facility can also be used to support amenity for tourism development by improving standard services in some aspects [12].

Ancillary Services (Institutional Services and Promotions)

Marketing information systems and tourism promotion

Pal coastal tourism areas does not have the information and telecommunication systems on tourism. Pal beach tourism promotion is done through words of mouth from visitors who came and enjoy the beauty of Pal beach. Visitor documentation contained in their social media accounts and also through the mass media.

The government needs to make the structuring and development of tourism

information systems effectively and comprehensively as one of the market access at home and abroad to promote the Pal beach. Developing a joint pattern promotion between regions and with tourism business, join tourism promotion events at the international, national, regional levels, and organizing promotional activities such as festivals are several programs that can be conducted to promote Pal Beach. Promotion is one of the most effective marketing elements for tourism product. The objectives of promotion which are consistent with the general marketing plan is to identify the target group to which the promotion is conducted, to find out the effective advertising, sales support and public relations programs to be planned, and to select the best methods to be used to control and assess the promotion implementation [21]. Every destination country should extend its efforts to discover the needs and follows necessary promotional strategies to raise interest among the potential tourists. It is very important for the decision makers to understand how customers acquire information especially for tourism related services and products [22].

Government policy

Government Work Plan of North Minahasa Regency in 2015 set the theme: continuing the acceleration of infrastructure supporting tourism, food security, economic democracy, and the conservation of natural resources [6]. Based on this plan, then tourism becomes one of the central development of North Minahasa District. This is the key to the development of attractions including Pal beaches.

Recommendation

North Minahasa Regency Tourism Office

North Minahasa Regency Government through the Department of Tourism and Cultural needs to make an MoU with BUMN as the State-Owned Enterprises to build Pal beach attraction. It is a pity if the potential of Pal beach is not developed and promoted as a tourism destination area. It necessary to restructure and mapping the Pal coastal tourism area unit. It is also crucial to attract investors to build tourism supporting facilities such as accommodation, tourism information center, souvenir shops, special attraction. The Pal Beach management should provide professional human resources in the field of hospitality and tourism attractions to manage Pal beach. Lastly, they need to increase counseling and training in preparing resources for the development of Pal beach tourism object.

Marinsouw Rural Community

Marinsouw community need to preserve their cultural customs, such as *Tulude* as a tourism attraction to be promoted. We also suggest to make *Masamper* dance attractions on certain days in Pal coastal resort. The community should manage local products such as *Goroho* banana chips, cassava chips, and skills for making plastic flower stalks as typical souvenir from Marinsouw village to raise the family economy. It is also important to raise awareness in maintaining the security and cleanliness of Pal coastal resorts.

CONCLUSION

Based on the results of the study on the development of coastal tourism object, it can be concluded that Accessibility (affordability) to Pal coastal resort needs to be repaired by resurfacing and widening the road. Attraction (points) in this culture, e.g. religious tourist attraction such as *Tulude* needs to be developed and packaged in an attractive way so that attract more domestic or foreign tourists to come to Marinsouw village and Pal beach. Pal coastal area need to build an inn or cottage accommodation in Pal coastal region. It is also necessary to hold art and culture of Marinsouw rural communities, souvenir shops, restaurants, public toilets, and additional recreation attraction for entertainment. For the ancillary services, there is a need to make marketing and promotional information systems of Pal beach tourism with the full support from the Government in promoting Pal beach attraction. It is expected that the local government cooperate with State-Owned Enterprises (BUMN) for the development of Pal beach tourism object.

REFERENCES

- [1] Statistic Center of North Sulawesi Utara. Tourism Development in North Sulawesi. Available at: sulut.bps.go.id/new/backend/2/brsind/brsInd-20161003164730.pdf.
- [2] Yoeti, O. A. 1985. Pengantar ilmu pariwisata. PT Pradnya Paramita. Jakarta.
- [3] Miles, M. B. and A. M. Huberman. 1992. Qualitative data analysis: sourcebook of new methods. Rohidi, T.R. (Transl). University of Indonesia. Jakarta.
- [4] Cooper, C., J. Fletcher, D. Gilbert, R. Shepherd and S. Wanhill, 1993. Tourism principles and practice model. Addison Wesley Longman Limited. England.
- [5] Telusur Indonesia. 2015. Pal beach tourism. Available at: <http://www.telusurindonesia.com>.
- [6] Work Plans of Regional Development North Minahasa. 2015. Government Work Plan of North Minahasa Regency in 2015. North Minahasa Regency.
- [7] Gabriel, T. 2016. Village Head of Marinsouw, East Likupang District, North Minahasa Regency. Personal Communication.
- [8] Indonesian Culture and Tourism Department. 2015. General planning and tourism area development. Available at: <http://www.indonesiacultureandtourism.com/2015/11/perencanaan-dan-pengembangan-kawasan.html>.
- [9] Asinar, R. S. Kenapa wisatawan ingin ke Indonesia? 2015. Kompasiana. Available at: https://www.kompasiana.com/syam/kenapa-wisatawan-ingin-ke-indonesia_54f36c79745513992b6c7539.
- [10] Attar, M., L. Hakim and B. Yanuwadi. 2013. Analisis potensi dan arahan strategi kebijakan pengembangan desa ekowisata di Kecamatan Bumiaji. Journal of Indonesian Tourism and Development Studies 1(2), 68-78.
- [11] Putri, S. D., Soemarno and L. Hakim. 2015. Strategic management of nature-based tourism in Ijen Crater in the context of sustainable tourism development. Journal of Indonesian Tourism and Development Studies 3(3), 123-129.
- [12] Normelani, E. 2017. The potentiality of tourism resources in Hulu Sungai Selatan Regency, South Kalimantan. Journal of Indonesian Tourism and Development Studies 5(1), 1-8.
- [13] Butarbutar, R. R. and Soemarno. 2013. Pengaruh aktivitas wisatawan terhadap keanekaragaman tumbuhan di Sulawesi. Journal of Indonesian Tourism and Development Studies 1(2), 87-96.
- [14] Gunawan, A. S., D. Hamid and M. G. W. Endang N.P. 2016. Analisis pengaruh pengembangan pariwisata terhadap sosial ekonomi masyarakat (studi pada wisata religi Gereja Puhsarang Kediri). Jurnal Administrasi Bisnis 32(1), 1-8.
- [15] Haryudi, R. 2015. Kepemimpinan Stage Manager dalam manajemen panggung pertunjukkan. NARADA, Jurnal Desain dan Seni, FDSK-UMB 2(1), 77-94.
- [16] Khairina, D. F. and M. Rahdriawan. 2014. Homestay sebagai usaha pengembangan

- Desa Wisata Kandri. *Jurnal Teknik PWK* 3(4), 1060-1071.
- [17] Isa, W. Pengembangan sarana dan prasarana daya tarik wisata. *Inspirasi-Edukasi*. Available at: cvinspireconsulting.com.
- [18] Khairun, N. and J. Arthani. 2011. Kualitas air dan persepsi wisatawan di Kawasan Alam Pulau Pinus Kalimantan Selatan. *Jurnal Hutan Tropis* 12(31), 26-36.
- [19] Dewi, R. P. 2017. Perancangan sistem pengelolaan sampah untuk mendukung perkembangan industri kreatif di daerah pariwisata. *Proceeding of National Seminar on Multi-disciplinary Studies and 3rd Call For Papers Unisbank (Sendi_U 3)*. 217-221.
- [20] Lagarensen, B. E. S. and A. Walansendow. 2016. Developing marine and coastal-based sport tourism on the waterfront: the case of Manado Waterfront, Indonesia. *Journal of Indonesian Tourism and Development Studies* 4(3), 107-114.
- [21] Baldemoro, J. 2013. Tourism promotion. Slideshare. Available at: <http://www.slideshare.net/JHBlue/tourism-promotion-28432196>.
- [22] Abul, H. M. 2015. Promotional activities in the strategic tourism development of Lapland case study: tour operator's appearance in social media. Thesis. Applied Sciences Programme Degree in Tourism. Centria University. Available at: <https://www.theseus.fi/bitstream/handle/10024/96778/Final%20thesis%20Hasan%202.pdf?sequence=1>.

Digital Tourism: A Content Analysis of West Java Tourism Websites

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Abstract

Digital tourism is one of three strategic priorities from Ministry of Tourism to increase the number of tourist who visiting Indonesia. Tourism industry is one of the successful sector using Internet media to share destination images, where the tourism websites becomes a very useful tool to promote tourism by giving important informations for visitors. This study explore the effectiveness of official tourism websites in West Java province, Indonesia. Content analysis method, consist of three dimension: Aesthetic (destination visualisation, websites design); Informative (uniqueness, monetary value, and cultural promotion); Interactive (e-travel planner, online communities) were used to asses 29 official cities and regency's tourism websites. The results presented within this paper showed that West Java tourism websites were found to be generally fair in one dimension but lacked to attracted visitors. Based on the result findings, it is recommended that the official tourism organisations should evolve their websites as the marketing tools and the most important for delivering positive images of the destination online. These research give implications for the local tourism websites administrator to improve the website's content and also further research in tourism websites evaluation.

Keywords: Content analysis, digital tourism, website's evaluation, west java tourism.

INTRODUCTION

As stated in Indonesia Government Work Plan 2017, Tourism is one of five priorities sector in 2017 for Indonesia's development, other sectors are food, energy, maritime, industrial estate, and Special Economic Zones. The development is in line with tourism sector as the Indonesia priority in National Medium-term Development Term (RPJM) 2015-2019. Tourism sectors become priority with an achievement target 20 million foreign visitors and 275 million domestic tourists in 2019. This sector in total will generate 260 trillion-rupiah [1].

Digital technology is one of the strategies in promoting Indonesia's tourism sector. This platform not only cheaper than the conventional way of promotion but also can reach more audiences both local and international. Development of digital facility directly expected to become a promotional channel to increase tourists visits, either in quality or quantity [2]. By using digital platform, the target audience will be more personnel, more professional, and more global that directly provide accessibility for all tourism stakeholders in Indonesia.

Furthermore, digital technology will also help the local government to communicate their regulation but not limited in licensing aspect, tourism activity, and providing accessibility for the tourist in information to the destination in

Indonesia [3]. According to The Travel and Tourism Competitiveness Report 2017 from 136 countries (Table 1), Indonesia has improved their position to 42nd rank on the competitive index with powerful competitiveness performance in pricing area (5th), natural resources (14th), and prioritization of travel and tourism sector (12th). However, there are many aspects should be improved. One of the aspect is in Information and Communications Technology or ICT readiness that achieve 91st rank [4].

In order to improve the global competitiveness index in Tourism, we should prepare the ICT readiness. Indonesia should increase consistently in ICT sector, because tourism is one of the successful industries that use an Internet benefit where the quantity and online transaction value grown and has multiple effects through the economy [5, 6].

Internet has radically change the tourism and traveling sector. Internet users browse the internet to collect an information of traveling and has visit associated tourism destination website, finally create an impact to the economy development of the associated destination. Generally, internet has to support their user to gain a deal and product for a better value [6]. Request on website quality is unavoidable along with an increasing of Indonesia Internet user. For tourism business, demands on interesting website either in content and appearance is an important category for the society to create an intention to open and taking a benefit of the tourism business website and generating an e-commerce process [7,8].

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Table 1. Indonesia ICT Readiness Competitive Index 2017

Index Component	Rank/136	Score*
ICT readiness	91	3.8
ICT use for biz-to-biz transactions	58	4.8
Internet use for biz-to-consumer transactions	28	5.4
Internet users %pop.	106	22.0
Fixed-broadband Internet subscriptions /100 pop.	107	1.1
Mobile-cellular telephone subscriptions /100 pop.	40	132.3
Mobile-broadband subscriptions /100 pop.	82	42.0
Mobile network coverage %pop.	108	95.0
Quality of electricity supply	88	4.2

Notes: ICT Scores [4], Scores are on a 1-to-7 scale unless indicated otherwise. For detailed definitions, sources, and periods, consult the interactive Country/Economy Profiles and Rankings at <http://wef.ch/ttcr>.

Research in hospitality and tourism sector has explained that the design of the website related to the marketing activities using Internet has effectively contribute in delivering the message, quality of the product and service, and business image [9]. According to the marketing aspect, the website development is not only one time practice, but regularly increase from the lower to the higher level of the website and create a functional and interactive aspect. As a result, the process can improve the website effectiveness. Tourism website should be designed in accordance with the organization vision, accommodate the requirement, including promoting the product information, also intention and expectation of the targetted market [10].

According to the previous researches, the online information is critical phase to plan a traveling process, currently buying behavior pattern strongly influences by the information from Internet media [11, 12]. In order to determined the tourism website, some researcher evaluates the website according to a comprehensive web content, quality, and website design where in this event, the site must be providing a clear information, accurate, and up-to-date [13, 14].

Some researchers in indonesia, explore the tourism websites by studying the domain for software application [15]. Comparison between accommodation website of five stars hotel using content-based aspect, and also tourism destination information content in tourism promotional official website [16, 17]. Research on the website of tourism office within Top 10 priority destinations studied by the facilities and service's information approach that exist on the website [14].

The website of tourism destination will be a reference for online visitors. Therefore, the website should be user friendly by adapting

standard features of tourism website and offering more up to date and comprehensive information about traveling to the related destination. The tourism website must have effective objection in enabling the visitors gathering a relevant information, navigating through various text and graphical element, and by creating first impression from the virtual way [18]. There are three phases related to the online information process: searching, advantage, and elaboration [19]. Most of the traveling planners prefer reading a review information from previous tourists review provided online rather than view the tourism brochure.

Effective tourism destination website should integrate the technology and marketing principle. The website should have an evaluation in the aspect of information, communication, transaction, user relationship, and technical service. Where the technical service directly influences effectiveness of others four marketing dimensions [20].

The tourism destination website must present an accurate information for the visitors in the level of marketing principle. After an appropriate implementation in information function, then the policy makers of the destinations must consider on the communication function and involve all marketing activity [20]. Moreover, the website enables the destination management in the local area to save their budget in printing and delivering the brochure and paper advertisement material, definitely support to decrease their limited promotional budget [21, 22].

There are three dimensions approach to measure tourism destination website effectiveness (Fig. 1), which are: Aesthetic dimension (AES) related on visitor accessibility of tourism destination website; Informative dimension (INF) on the quality of the tourism destination website; and Interactive dimension (INT) on the

two directions guideline interaction for visitor, associated organization, community, and tourism business in related destination [23]. From these three dimensions, generated seven categories will clearly identified the aspect that really important for tourism website. The subcategories of aesthetic dimension are visualization of destination area and web design. The informative dimensions are a uniqueness factors of the website, the price range, and promotion of culture. The interactive dimensions include e-travel guideline and online community [23].

The aims of this research are to analyze how far the quality of the tourism office website in each regency and city located in West Java province based on Aesthetic, Informative, and

Interactive dimension. There is no previous study related to in-depth research in measuring the tourism website content specifically in the scope of province destination area in Indonesia. Therefore, this research tries to answer some questions on condition in accessibility, interactive, and delivering an information to all parties of the society, from domestic to international tourist.

The result from this research will provide a suggestion to management parties of the tourism destination website related to actual condition. This research should explain a description and in-depth information on the website development manage by tourism offices in West Java province.

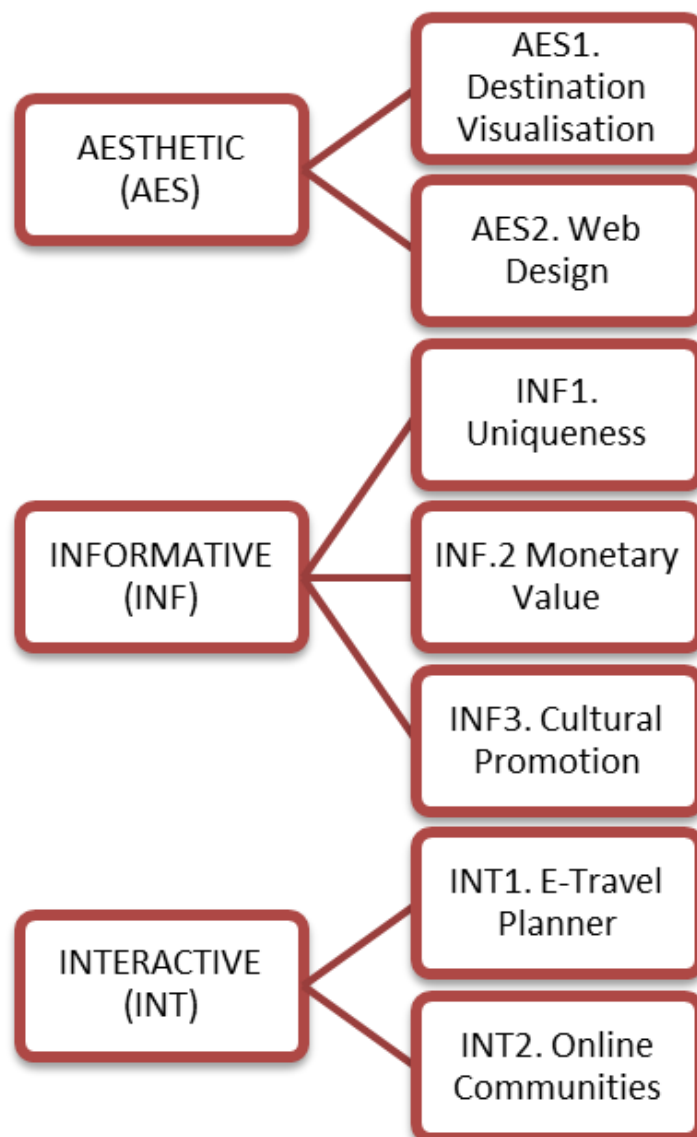


Figure 1. Dimensions and categories to measure tourism websites effectiveness [23]. Details in Supplementary 1.

RESEARCH METHOD

According to content analysis, the researcher will observe the description of content, message characteristic, and the development of content. This method will systematically identify the visible content communication (manifest), and a practical objectives, valid, reliable, and replicable. The researchers in the content analysis in the tourism sector focus on the language communication selection and concentrated to the content and the context of the text. Textual data collection could be in verbal, virtual, or printing media. The data collection process is from descriptive narrative process, open-ended question survey, interview, focus group, observation, or through by the printing media [24].

Epistemologically, there are two categories in this research to analyze the content based on the social science: qualitative and quantitative approach. Qualitative approach is the non-statistical and exploratory method involving inductive reasoning [25]. The quantitative

approach refers to statistical conclusion method from the text population. The central idea of quantitative content is many words from the text are classified into much fewer content categories [26]. Quantitative content analysis of this research will evaluate the written communication and visual practice in the website of the regency and the city of tourism office in West Java province as communication media and promotional kit. Content analysis applied in this research because this method is a simple method to practice, effortless to continue for further study, and has remote possibility study without interfere the subject [27].

Sampling and Data Collection Procedure

The Ministry of Tourism has been offering many options of tourism office websites in 33 provinces of Indonesia as a research data. This study will focus on an evaluation of the tourism website in West Java province. The samples are 18 regencies and 10 cities in the administrative area of West Java province (Fig. 2).



Figure 2. Administrative Map of West Java Province [4].

This research will observe 29 tourism websites in West Java, consists of one official website of West Java tourism office, 18 websites of regency tourism board, and 10 websites of city tourism office in the administrative area of West Java province. An initial observation was done to collect the website address information associated to tourism destination in West Java, which consists of one primary website of tourism office in West Java province, 18 tourism websites in regency level, and nine websites of tourism office in the city level of West Java province.

Encoding the Website Content

Three researchers with tourism background analyzed the tourism office website. The researchers spent two hours in training session; the researcher tries to encode some websites sampling. The final coding processed in the period of 2 months in 2017. The researcher that accepted the coding book and website URL lists requests to work independently to evaluate 29 websites of tourism office in West Java province.

The homepage of the target website (the first page displayed in the website) is the analysis unit of this research. The research objects are the reliable websites in terms of information quantity, navigation structure, and comprehensiveness (in number of secondary page information). Therefore, the main page of the website homepage encodes with content analysis method.

Furthermore, the researcher team developed a coding book with three variables, including seven categories and 47 indicators for this research [23]. Every website sign by the code number, 1 if the requirement content of all indicators is available, and 0 if the content of every indicators is not available. Pilot test study in West Java tourism main website is to examine the survey instrument. In order to evaluate the minimum and maximum score of every website involves in this research, and then creates a measurement to calculate the capability of websites in the seven categories of this research. Implementation of the survey instrument should be conducted completely for a website of tourism office before moving to another website [27].

There are seven categories with 45 different indicator's, value for each category in percentage (%) are calculated by the number of indicators for each categories divide to the total number of indicators available for measuring tourism websites (Table 2). The first category is destina-

tion visualization (AES1) this category will indicate the capability of the website to give the visitors an appealing background, the use of color and pictures, destination logo and slogan, video, newsletter, and online brochures. In this, category represents seven indicators or equal to 16% from total indicators. The second categories, web site design (AES2) will be measured how the tourism website has a clear text, uncluttered web page, easy to remember web address, table of contents, site map, home button, search navigation and latest update of the website represent 20% for all categories.

The third categories related to information uniqueness (INF1), which included specialized travel trips, using another languages, and sufficient for information for traveling represent 7% of the all categories. The fourth categories will give information for the visitors regarding the monetary value of the destination (INF2), included travel package's prices, hotel room rate, food and beverage price, transportation cost, special festivals and events price, and also an attraction admission fees represent 16% of the categories. The fifth categories related with the cultural promotion (INF3) represent 11% of all categories, included information about the tourism attraction and things to do on the destination, local weather, and insider tips from local authority, and culture information.

Table 2. Value of each category and Indicators number

Dimensions	Categories	Value (%)	Number of Indicators
Aesthetic	Destination visualization	16	7
	Web Design	20	9
Informative	Uniqueness	7	3
	Monetary Value	16	7
Interactive	Cultural Promotion	11	5
	E-Travel Planner	22	10
	Online Communities	9	4
TOTAL		100	45

Source: Han and Mills [23].

The Sixth categories are related the function of the website, as an interactive media for the traveler to plan their trip the E-travel planners (INT1) are the most value categories in the tourism website evaluation covering 22% of all categories. On these categories included the information of hotel and other accommodation, information to local attraction, information of restaurant, link to travel agent, information on

car rental on the destination, information about the events and festival reservation, contact information to non-tourism organization, and also maps on major attraction at the destination. The seventh category is related with the online communities (INT2) on the Frequently Asks Questions (FAQ) by the visitors, order free guide book online, subscription for news, newsletters and vacation deals are represent 9% of the total categories in tourism website evaluation.

Moreover, a guideline percentages range to supports the evaluation process of every website. The guideline has a function to determine a measurement of website competitiveness level with 51% value composition to 100% means has a good performance and as the highest category. The value 11-50% is average performance, and less than 10% are the lowest website performance.

RESULT AND DISCUSSION

Identification of 29 tourism websites of West Java province performs by searching activity to the official tourism websites. The list of websites found by Google search engine, each URL address was examined in detail. Initial observation found an information of an accessible website lists, under construction, inaccessible, and tourism office without an official website.

The website's evaluation measures the performance aspect of the websites by four approaches dimension of tourism website presentation, which is (i) aesthetic dimension (AES), (ii) informative dimension (INF), and (iii) interactive dimension (INT). This research focuses on the distinction and similarities of the website dimensions by evaluating the instrument designed for this research. Coding sheet generates from the guideline, and the result conclusion will have an in-depth analysis [23].

This section will discuss about content analysis results of the 29 tourism office websites in the regency and the city of West Java province. There are four discussion sections, which are content analysis in aesthetic, informative, attractive dimension, and the last section is a comprehensive analysis of the tourism office website in the regencies and cities of West Java province.

An initial searching found 29 websites of tourism office in the regency and the city of West Java province and only 20 websites are accessible. The reason why nine websites are inaccessible because the factor of: Sukabumi city

has a tourism blog, not official websites. In addition, Karawang Regency, Cimahi City, and Banjar City do not have an official tourism website. Tasikmalaya Regency, Majalengka Regency, and Cirebon City tourism websites are under development or under maintenance. Under maintenance status of the website is regular activity of the website administrator to maintenance the website properly live. In this event, access to the website is inaccessible.

Moreover, Cianjur Regency and Tasikmalaya City websites are suspended. Suspended website has some factors, such as pending hosting payment, the overload server, or infringement to the Terms and Condition of the hosting service. Accessibility of the tourism official websites, made the further process only contain the analysis from 20 websites.

Result of Aesthetics Dimension Content (AES)

According to the content analysis in 20 websites of the regency and the city of West Java province, the average of all tourism office websites fulfills 82% or 16 from 20 indicators for aesthetic dimension requirement, related on visualization of tourism destination and design of the website.

Destination Visualization (AES 1)

The coding result from 20 tourism office websites in West Java in visualization aspects found that 19 tourism office websites applied a background, an appropriate color for visual appeal, and exposing the photos of their destination to improve the image of their area. Moreover, a short video description for local tourism area applied by 12 tourism websites.

Interestingly, every website such as Ciamis Regency display the background combines with an attractive flash player animation and presenting an eye-catching background, photo, and color. In addition, the West Java official tourism websites manage by West Java provincial government has been implementing the color combination of dark brown, gold, and green as a reflection of West Java.

Additional indicator such as bulletin media applied by 15 websites, while Kuningan Regency, Indramayu Regency, and Depok City does not have bulletin content for their website. Fewer indicators of every region in visualization category of destination are online brochure implementation and accessible for every website visitor. West Java provincial government, Sumedang Regency and Bandung City are not providing online brochure service. Appearances

of logo or slogan in the website are not completely applied, only 12 websites displaying their local logo or slogan.

Web design (AES 2)

There are 20 tourism office websites applied clear and readable indicators; the indicator has a relationship with font type, contrast between background and text, and creating a clean and uncluttered page. Total 20 websites providing availability of Home button in the website homepage. Nineteen out of 20 websites have table of content, but this number is not proportional with search engine practice for website content. Only 18 websites have additional dimension. Cirebon Regency and Subang Regency do not apply this dimension to their website. This number will be declined if associated with another indicator related to browsing data in the website or the site map. Only 7 from 20 website have the sitemap for their visitor.

There are 19 websites continuously updating their local tourism data and providing latest updates of web page/update version as an indicator of information. This is the indication of an appropriate website management of the local area and responsibility in management indicator. Bandung Regency website is the only one website that does not provide to update information, the latest information is 2012.

Easy to remember indicators of the website address name were found on nine websites. The other's websites still practice a sub domain in the name of their area. Acronym usage of tourism office bases on the local area apparently ineffective because the domain is longer, and including a character that's hard to find by visitors. Examples of tourism office website address comparison: <http://disparbud.kotabogor.go.id/> for Bogor City and Bandung city with <http://www.bandungtourism.com/>, where the Bandung City tourism website has an easy terminology to remember globally, by using the name of the city and English terminology.

Result of Informative Dimension Content (INF)

Performance in 17 of 20 websites in West Java area only limited in providing information in terms of a uniqueness; information of financial value of facility, price, and promotion; and cultural promotional categories in every tourism office are below level or 50%. The average percentage is 38% or 6 of 15 indicators are available.

Uniqueness (INF 1)

Based on the content analysis of 20 website, each websites has a characteristic features in providing the information about specialize in travel trips to the feature destination and tourism attraction of every area. Total of 18 websites publish various destinations, such as Sumedang Regency website that highlight traveling to the local natural tour destination, from the mountain, jungle, river to the south of Java Sea. Kuningan Regency highlights traveling activity, especially to Geo park site and maritime tourism, such as surfing in their local area. Some websites have a proper order in tourism specific category of interest, for example the culinary tourism (Bandung City, Bogor City, Garut Regency).

Moreover, sufficient information content on travel guide to the area, consist of public transportation access, location data to the destination, and statistic of local tourism. The information is available to download from tourism office websites of the regency and city of West Java. The information is related to the e-government function. One of the functions is providing data transparency to the public.

There are some important aspects should be improved from 75% of the website (15 websites) which are not providing availability of foreign language facility in presenting their website data. There are only five websites has been providing a support access for English language, Bandung City website, Sumedang Regency, Garut Regency, Cirebon Regency, and Ciamis Regency. Moreover, two websites provide option more than two languages, Sumedang Regency website with Indonesia, English, and Japanese. Ciamis Regency has nine languages option for their visitors, English, Germany, Spanish, Mandarin, Arabic, Russian, Italian, France, and Dutch.

Monetary value (INF 2)

Economical factor to calculate the process of tourism traveling activity is the price range of various aspects in the tourism destination. Every website in this category could provide a data about standard price of the infrastructure in the tourism destination. In this regard, 90% of tourism office websites in West Java province does not provide information of the price range for accommodation, restaurant, attraction, and tourism festival, local public transportation, and special price offer for the visitor when visiting to the destination. This condition certainly became

a shortage for every area in promoting every business sector of local tourism.

There are four websites present an information about the range of prices on the hotels, from the various accommodation types in their local area, Bandung City, Bogor City, West Bandung Regency, and West Java province. In addition, two websites explain the information of standard price for package for the visitor candidate, and entry ticket for some tourism attraction or the price on other attractions). The number is getting smaller when we are describing information of price on public transportation and online special price. Two indicators, range prices of restaurant and range of prices on the festival held by the local tourism destination, as far as the complementation of this paper are not yet provided by the websites to be analyzed in this study.

Cultural promotion (INF 3)

The tourism official websites in West Java province has properly promoting activity in terms of the introducing native culture of Sundanese to the tourist candidate. In addition, in terms of information of well-known attraction, including things to do in the destination, the website has described proper information. Textual information is not only information but also the pictures of tourism attraction should be exhibited as part of promotional activity of the tourism destination.

Weather information should have improvement of the destination for the tourist. Only Seven websites have been displaying weather information. In addition, more important information is the regulation of the local area such as visa, customs and excise. More perspective of an essential information or insider tips are applied in six websites. Some interesting dimension is writing the experience when visiting the area on a media of the tourism office website of Bandung city. Websites of West Java provincial government, Bogor city, Garut regency, Bogor regency, and Pangandaran regency are also providing related information.

Result on Interactive Dimension Content (INT)

There are 8 of 20 websites has proper content, 12 websites should improve the feature to become more interactive for the visitor. Average total values of 20 websites are 55% or 8 of 14 categories are above the average.

E-Travel planners (INT 1)

Electronic travel planner content is the most indicators in this research, interactive information to support the visitor to plan their journey. Therefore, up to date on the related information of a destination is highly important. According to the factual analysis of this category, has been providing information / website link / contact information of tourism attraction of the area. Total 17 websites present an information content indicator of their event activity, booking for the special event of the local area, and contact information of National Tourism Organization (NTO).

Additionally, accommodation and restaurant list in the local expose in 13 websites of tourism office. The number will decrease when the category is associated with comprehensive information of hotel accommodation in terms of URL link or phone number; 11 websites provide this information. More information on local tourism attraction explains by 12 websites of tourism office, and 11 websites providing a guideline in form of the main tourism attraction map of the local area. This category should consider in the integration of the travel planner party, such as tour and travel agent, travel biro, and rental transportation service.

Online communities (INT 2)

Total of 14 tourism office websites provide an online subscription service for up to date information about the associated office. There are only 10 websites that provide Frequently Asks Questions or FAQ from the visitors.

Only 8 websites provide online travel consulting services. Contradict, none of the tourism websites in West Java province provide an online booking guideline for traveling of their local area to the visitors.

Rank of the Websites

The recapitulation result explained that the website of Bandung City tourism office is the first position in providing a facility for all categories in their website content, even the website only fulfills 37 of 45 total indicators (Table 3). Moreover, the lowest value is the website of Bekasi Regency with 13 indicators value of all informative indicators for tourism website.

The average of the tourism website for regency and city of West Java province is 27 or 59% information content of 45 ideal indicators of the tourism website. These numbers explain 20 websites of West Java province tourism have been presenting a proper information service.

Table 3. Result from Content Analysis of 20 websites in West Java, 2017

Name of Cities & Regencies	AESTHETICS (AES)		INFORMATIVE (INF)			INTERACTIVE (INT)		3 dimensions	
	AES 1 (7 items)	AES 2 (9 items)	INF 1 (3 items)	INF 2 (7 items)	INF 3 (5 items)	INT 1 (10 items)	INT 2 (4 items)	7 Categories (45 items)	
	Score (%)							Score	%
Bandung City	100	100	100	29	100	80	75	37 / 45	82
Pangandaran Regency	71	89	67	57	80	100	75	36 / 45	80
West Java Province	100	89	100	0	80	100	75	35 / 45	78
Bogor City	86	100	67	14	80	100	75	35 / 45	78
Garut Regency	86	89	100	0	100	90	75	34 / 45	76
Sumedang Regency	100	89	67	0	80	80	75	32 / 45	71
Bandung Regency	71	100	67	43	80	50	50	30 / 45	67
Bogor Regency	86	100	67	0	60	80	50	30 / 45	67
Subang City	71	100	67	0	60	60	25	26 / 45	58
Cirebon Regency	57	89	67	0	60	80	25	26 / 45	58
Subang Regency	57	100	67	0	80	50	50	26 / 45	58
Kuningan Regency	57	78	100	0	80	60	0	24 / 45	53
Purwakarta Regency	86	89	67	0	80	20	25	23 / 45	51
Sukabumi Regency	57	100	67	0	60	40	25	23 / 45	51
Bekasi City	71	89	67	0	40	40	50	23 / 45	51
Bandung Barat Regency	86	78	67	0	60	30	25	22 / 45	49
Ciamis Regency	57	89	100	0	60	30	25	22 / 45	49
Depok City	43	100	33	0	40	40	0	19 / 45	42
Indramayu Regency	43	89	0	0	20	30	0	15 / 45	33
Bekasi Regency	29	67	0	0	0	50	0	13 / 45	29

According to the result, eight websites of tourism office fulfill the information content and above of the average of all total websites of tourism offices in West Java. Moreover, the others 12 websites should improve their website content quality, especially in the monetary value (INF 2), cultural promotion (INF 3) from informative dimension, and an e-travel planner (INT 1) categories, and online communities (INT 2) in interactive category.

After measuring the value, then the percentage result produce in all websites, as presenting in the Table 3. The top five websites of tourism office West Java province ranks with more than 75% percentage value are the Bandung City, Pangandaran Regency, West Java Province, Bogor City, and Garut Regency website. Moreover, 10 tourism office websites in 50%-74% range are Sumedang Regency website, Bandung Regency, Bogor Regency, Subang City, Cirebon Regency, Subang Regency, Kuningan Regency, Purwakarta Regency, Sukabumi Regency, and Bekasi City. Five tourism websites of tourism office in 50% range value are West Bandung Regency, Ciamis Regency, Depok City, Bekasi Regency, and Indramayu Regency

CONCLUSION

Digital tourism will be providing accessibility to all tourism stakeholder in Indonesia, from licensing aspect, tourism activities and events, and presenting accessibility for the visitors to find information regarding the tourism destination in Indonesia. A functional, enlightened, and interesting website will force

and facilitate the visitors to visit the tourism destination. The tourist will have more value to destination because of the collection of information in price and special promotion price for the tourist. In order to maintenance loyal visitors, an organization should open many opportunities to the destination by communicating to the visitor, exposing the advertisement of the destination, and increasing the level of customer involvement.

As the result, this condition creates a possibility to tourism destination management with the opportunity to improve the loyalty level of the customer. The result is not only beneficial for destination managements, but also providing an insight for the policy maker and tourism organization as the effort to promote their destination through the Internet media. Definitely, this information will become a support information on the website reliability of tourism office. In fact, the tourism website destination is an image representation of a country. Further study should examine a wider scope of the city and regency in Indonesia country region regarding the practice of the standardization of the tourism website.

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REFERENCES

- [1] Khumaedy, M. A. 2017. Tahun 2017 Kita Genjot Sektor Pariwisata. Available at: <http://setkab.go.id/tahun-2017-kita-genjot-sektor-pariwisata>.
- [2] Pitana, I G. and S. P. Putu-Diah. 2016. Digital marketing in tourism: the more global, the more personal. In: Wiranatha, A. S., I P. E. N. Kencana, I K. G. Bendesa, I N. D. Putra, I G A. O. Suryawardani (Eds). International Tourism Conference: Promoting Cultural and Heritage Tourism. Udayana University, Bali. 1-3 September 2016, 116-125.
- [3] Noviyanti, S. 2014. E-Tourism: bentuk promosi pariwisata Indonesia selanjutnya. Kompas Travel, I Made Ashdiana (Eds.) Kompas Gramedia, Jakarta.
- [4] Roberto-Crotti, T. M. 2017. The travel and tourism competitiveness report 2017: paving the way for a more sustainable and inclusive future. In: Roberto-Crotti, T.M. (Ed). 2017 World Economic Forum. Geneva.
- [5] Buhalis, D. and R. Law. 2008. Progress in information technology and tourism management: 20 years on and 10 years after the internet—the state of eTourism research. *Tourism Management* 29(4), 609-623.
- [6] Yuan, Y. L., U. Gretzel and D. R. Fesenmaier. 2003. Internet technology use by American convention and visitors bureaus. *Journal of Travel Research* 41(3), 240-255.
- [7] Khudri, T. M. Y., D. Martani and T. I. Maulana. 2013. Analisis kualitas desain dan kunjungan situs pemerintah daerah di Indonesia. *Proceeding of PESAT (Psikologi, Ekonomi, Sastra, Arsitektur dan Teknik Sipil)* 5, E-40 – E-49.
- [8] Putra, F. K. K. 2017. Analisis informasi situs web hotel bintang 4 di kota Bandung. *Tourism and Hospitality Essentials (THE) Journal* 7(1), 7-20.
- [9] Ting, P. H., C.F. Kuo and C. M. Li. 2012. What does Hotel Website Content Say About a Property: an evaluation of upscale hotels in Taiwan and China. *Journal of Travel and Tourism Marketing* 29(4), 369-384.
- [10] Sweeney, S. 2005. One hundred and one ways to promote your web site. Florida: Maximum Press.
- [11] Law, R., S. Qi and D. Buhalis. 2010. Progress in tourism management: a review of website evaluation in tourism research. *Tourism Management* 31(3), 297-313.
- [12] Law, R. and B. Bai. 2008. How do the preferences of online buyers and browsers differ on the design and content of travel websites? *International Journal of Contemporary Hospitality Management* 20(4), 388-400.
- [13] Zhou, Q. and R. DeSantis. Usability issues in city tourism Web site design: a content analysis. In: Hayhoe, G. (Ed). *Proceedings of International Professional Communication Conference (IPCC 2005)*. IEEE (Institute of Electrical and Electronics Engineers). Limerick, Ireland. 10-15 July 2005, 789-796.
- [14] Subandi, M. R. and F. K. K. Putra. 2017. Website evaluation for the local tourism offices of Indonesia's top 10 priority destinations. In: Amin, Md. R. (Ed). 1st International Conference on Tourism. Department of Tourism and Hospitality Management, Faculty of Business Studies, University of Dhaka, Bangladesh. (n.a).
- [15] Nurmi, N. 2017. Membangun Website Sistem Informasi Dinas Pariwisata. *Jurnal Edik Informatika* 1(2), 1-6.
- [16] Adi, S. 2014. Evaluation on the effectiveness of the web technology usage in promoting and marketing Indonesia tourism. *Journal of Theoretical and Applied Information Technology* 68(3), 622 – 629.
- [17] Sari, R. P. 2016. Analisis tingkat pengungkapan konten dari websites hotel bintang 5 di Indonesia. *Jurnal Kajian Bahasa dan Pariwisata (BARISTA)* 3(2), 223-234.
- [18] Palmer, A. and P. Mc Cole. 2000. The role of electronic commerce in creating virtual tourism destination marketing organizations. *International Journal of Contemporary Hospitality Management* 12(3), 198-204.
- [19] Kim, H. and D. R. Fesenmaier. 2008. Persuasive design of destination web sites: An analysis of first impression. *Journal of Travel research* 47(1), 3-13.
- [20] Li, X. and Y. Wang. 2010. Evaluating the effectiveness of destination marketing organisations' websites: Evidence from China. *International Journal of Tourism Research* 12(5), 536-549.
- [21] Feng, R., A. M. Morrison and J. A. Ismail. 2004. East versus West: a comparison of

- online destination marketing in China and the USA. *Journal of Vacation Marketing* 10(1), 43-56.
- [22] Gretzel, U., D. R. Fesenmaier, S. Formica and J. T. O'Leary. 2006. Searching for the future: challenges faced by destination marketing organizations. *Journal of Travel Research* 45(2), 116-126.
- [23] Han, J. H. and J. E. Mills. 2006. Zero acquaintance benchmarking at travel destination websites: what is the first impression that national tourism organizations try to make? *International Journal of Tourism Research* 8(6), 405-430.
- [24] Berg, B. L. 2004. *Methods for the social sciences: qualitative research methods for the social sciences*. Pearson Education. Boston.
- [25] Weber, R. P. 1990. *Basic content analysis*, 2nd Ed. Sage Publication. California.
- [26] Barreda, A. and A. Bilgihan. 2013. An analysis of user-generated content for hotel experiences. *Journal of Hospitality and Tourism Technology* 4(3), 263-280.
- [27] Millar, M. and G. Sammons. 2006. *A content analysis of Costa Rican ecolodge Websites*. The University Of San Francisco. San Francisco.

Supplementary 1. Table Dimensions, Categories, Indicators for Content Analysis in Tourism Websites

DIMENSIONS	CATEGORIES	INDICATORS
AESTHETIC (AES)	AES1. Destination Visualisation	AES1.1. Aesthetically appealing background; AES1.2. Use of colour to improve the visual appeal of the site; AES1.3. Use of pictures to enhance the aesthetics of the destination; AES1.4. Destination logo/slogan; AES1.5. Availability of online video clips (virtual tour); AES1.6. Availability of online newsletters; AES1.7. Availability of online brochures.
	AES2. Web Design	AES2.1. Clear and readable text; AES2.2. Clean and uncluttered page; AES2.3. Sufficient contrast between background and text; AES2.4. Easy to remember Web address; AES2.5. Table of contents; AES2.6. Site map; AES2.7. Availability of 'home' button; AES2.8. Search engine for website content; AES2.9. Late update of Web page (date of the last updated version).
INFORMATIVE (INF)	INF1. Uniqueness	INF1.1. Specialised travel trips — e.g. families, convention, food, experience culture, sporting events, etc.; INF1.2. Availability of foreign language; INF1.3. Sufficient (adequate) information on trips or travel.
	INF2. Monetary Value	INF2.1. Standard price for packages; INF2.2. Online special prices; INF2.3. The range of price on restaurants; INF2.4. The range of prices on hotels; INF2.5. The range of prices on public transportation; INF2.6. The range of prices on festivals; INF2.7. The range of prices on other attractions.
	INF3. Cultural Promotion	INF3.1. Information on well-known attractions; INF3.2. Local weather information; INF3.3. Things to do; INF3.4. Essential information (visa, custom, etc.) or insider tips; INF3.5. Introduction of the culture.
INTERACTIVE (INT)	INT1. E-Travel Planner	INT1.1. Link or contact information to hotels/accommodations; INT1.2. Links or contact information to local attractions; INT1.3. List of accommodations; INT1.4. List of restaurants; INT1.5. Link or contact information to online travel agent/agency; INT1.6. Information/link/contact information on rent-a-car; INT1.7. Information/link/contact information on other attractions e.g. museum; INT1.8. Information/link/contact information on events and festival reservations; INT1.9. Contact information of NTO; INT1.10. Maps of major attractions;
	INT2. Online Communities	INT2.1 Availability of online community (FAQ); INT2.2 Order (free) guide book (pamphlet); INT2.3 Online travel board; INT2.4. Online subscription for news, vacation deals or newsletters.

Adapted from: Han and Mills [23].

The Analysis of Ecotourism Eligibility in the North Coast of Makassar

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Abstract

Ecotourism is one of environmentally friendly tourism activities which prioritizes the aspects of nature conservation, social economic culture empowerment and aspects of learning and education. Bira village, located in the coast of Makassar, has a good mangrove potential and it can be developed as a place of mangrove ecotourism. This research aimed to analyze the potential of ecology, socio-economic and supporting infrastructure for the eligibility of developing Mangrove ecotourism at Bira village of Makassar. The research design used was survey research which was descriptive analysis through case study approach. The method used was quantitative and qualitative approach. Quantitative approach used questionnaire method while qualitative approach used in-depth interview technique and field observation. Data obtained was analyzed by weighting method, spatial analysis and AHP. The results showed that the criteria of ecological eligibility included in the category was the value of 73.99; the category of socioeconomic eligibility was in accordance with the value of 81.55 and the eligibility criteria of supporting infrastructure included in the category in accordance with the acquisition value was 77.93.

Keywords: ecotourism, eligibility criteria, mangrove.

INTRODUCTION

The development of tourism is one of the growing economic drivers in every region of Indonesia. Scholars point out that there are several tourism developments that have concepts such as nature tourism, cultural arts, and historic buildings [1]. One of tourism parts is currently ecotourism. Ecotourism is one of environmentally friendly tourism activities which prioritizes aspects of nature conservation, aspects of socio-cultural empowerment, economics and aspects of learning and education [2]. Ecotourism is also a tourism management that prioritizes the environment and cultural values or local wisdom that exist in the community [3].

The utilization of mangrove forest for ecotourism has the potential of natural beauty and environment in the form of ecosystem component consisting of vegetation, biota or organism association, wildlife and surrounding environment [2]. The function of the mangrove forest is as a habitat, spawning area, nutrient provider and etc. Other functions of mangroves

are as a place of research, education and ecotourism [4].

Ecotourism development is a concept of sustainable tourism development that aims to support environmental conservation efforts (nature and culture) and increases community participation in management, thus provides economic benefits to the community [5]. Sustainable ecotourism development aims to provide a quality experience to the travelers and to improve the quality of life of local communities. Most of ecotourism destinations are located in remote area. Hence, the development of ecotourism requires several strategies including increasing promotion, preserving the environment and involving the community in tourism development [6,7]. Institutional aspects, both government and society, also need to be analyzed so it will not become an obstacle in ecotourism development, as well as facilities and infrastructure of ecotourism areas [5].

Ecotourism development is a concept of sustainable tourism development aimed at supporting environmental (natural and cultural) conservation efforts and increasing community participation in management, thereby providing economic benefits to local communities. Sustainable eco-tourism development aims to provide a quality experience of travelers and

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improve the quality of life of local communities [8]. The potential of coastal and marine areas are still many that have not been utilized optimally due to the relatively low quality of human resources and the weak socio-economic conditions of coastal communities [9].

Ecotourism is basically based on activities done in the open, although ecotourism is not always synonymous with tourism in general. Therefore special criteria are required in selecting ecotourism attractions [10]. The management of ecotourism in the north coast of Makassar has a big enough prospect to be developed. It refers to Regional and Space Planning (RSP) Makassar 2010-2030, the development of ecotourism utilizes the function of mangrove forest area to develop environmentally friendly tourism by preserving and managing mangrove area on the north coast of Makassar. The development of tourism in Makassar currently showed a fairly high increase, in 2013-2014 domestic tourists who came to Makassar about 2,072,538 people and 28,699 foreign tourists. In 2015, domestic tourists were 3,027,096 people and foreign tourists around 32,385 people [11].

Environmental degradation that occurs in coastal areas of Makassar such as silting (high sedimentation) and garbage can threaten the sustainability of coastal and marine resources in that area if it is not addressed immediately. Sedimentation is very good for mangrove forests, but if the quantity is high enough, it will threaten the existence of mangrove itself. Therefore it is necessary to handle with coastal ecotourism

development effort. The development of ecotourism in this area is expected to be able to integrate with the surrounding community so that it can improve the prosperity of society and environment in the north coast of Makassar. This research aimed to analyze the potential of ecology, socio-economic and supporting infrastructure for the eligibility of developing mangrove ecotourism at Bira village of Makassar.

RESEARCH METHOD

This research was conducted at Bira village of Tamalanrea Sub-district of the North Coast Makassar (Fig. 1). According to Clark and Salm, several analysis of ecotourism conditions and eligibility can be developed, such as ecological criteria, socio-economic criteria and supporting criteria [12]. Ecological criteria consists of mangrove forest diversity, uniqueness, authenticity, harmful biota, and regional status. Socioeconomic criteria consists of community acceptance, public health, culture, education, security, employment and economic benefits. While the supporting criteria consists of accessibility, electricity, clean water, telecommunication and handling of garbage.

The data obtained from the questionnaires were processed by using tabulate analysis, then calculated the score and weight of each indicator. The total of respondents' answers was multiplied by the assessment criteria (Table 1) to obtain the score of the research result (questionnaire), then it was compared with the ideal score (highest score for each answer) to obtain the score of each variable.

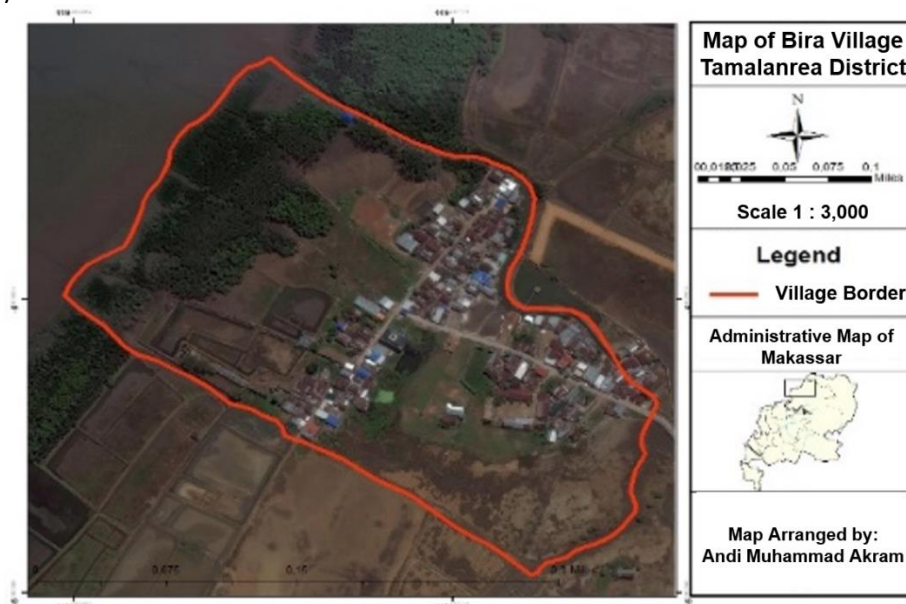


Figure 1. Map of Study Area (Source: Administrative Map of Makassar)

$$\text{SCORE} = \frac{\text{Total score of results}}{\text{Number of ideal scores}} \times 100\%$$

Next weighing was done by using AHP method to determine the priority scale of each variable, the method used was paired comparison or pairwise comparison with the help of expert choice application. This method was used to determine the weight of each variable by following scale:

- 1 = if the horizontal indicator was as important as the vertical
- 3 = if the horizontal indicator was slightly more important than the vertical indicator
- 5 = if the horizontal indicator was more important than the vertical indicator

Once the scores and weights were known then further determined the value of eligibility. The value of eligibility was determined by the number of scores obtained from the respondents' answers and multiplied by the weights.

Eligibility Value = Score x Weight

The result of the multiplication of scores and the weights obtained was the eligibility of the research area in ecotourism development. The eligibility value was then adjusted to the standard in Table 1 to see the rating category.

Table 1. The Standards of Eligibility Values for Ecotourism Development

Eligibility Value (%)	Eligibility Category	
81.26 – 100.0	Very Appropriate	Very Good
62.52 – 81.25	Appropriate	Good
43.76 – 62.52	Less Appropriate	Less Good
10.00 – 43.76	Not Appropriate	Not Good

Source: Tuwo [5]

Data Collection

Quantitative and qualitative data collection was done simultaneously. In this study the data collection was done by using following method.

Quantitative Data

Questionnaire, a list of questions was given to the respondents. It is used to determine the socio-economic conditions of the community includes culture and customs, education, employment, economic benefits, security, as well as acceptance and perceptions of the community on ecological conditions and supporting infrastructure of the ecotourism at Bira region.

Qualitative Data

Observation was how to collect data on direct observation at research location. Observed data were the physical condition of the environment,

naturalness, cleanliness of the area, the availability of supporting infrastructure, accessibility and transportation.

Interview to complete supporting data addressed to informant as main resource for tourism object manager, i.e. Tourism Office, Research and Development Office (Bappeda) of Makassar, Fishery and Marine Office of Makassar. The information is about the opinions, directions, and government policies on ecotourism development. *Documentary study* was also used for collecting the literature that can help in identifying the potential of Bira Village.

RESULT AND DISCUSSION

An Overview of Research Objects

Closure of mangrove forest land from 2001 to 2015 experienced a major improvement in Makassar. The area of mangrove forest in 2001 was 50.3 Ha while in 2015 it was 58.52 Ha. This shows the extent of the forest of mangrove had a wide increase of 8.23 or 16% of the total area of Makassar.

There are several factors that cause the expansion of mangrove forest, one of them is planting mangrove seeds. Based on the results of identification of mangrove vegetation at Bira, it was found 4 types of Mangrove, i.e. *Avicennia alba*, *A. marina*, *Rhizophora mucronata* and *R. apiculata*. Then, there are three important variables to analyze the eligibility criteria of ecotourism. Those are ecological eligibility, socioeconomic eligibility and supporting infrastructure facilities that must be considered.

Ecological Eligibility

The Diversity of Natural Resources

The results of data analysis conducted based on questionnaire data showed that the diversity of natural resources for ecotourism development at Bira Village was appropriate or good with score 80.3. The mangrove species found at Bira village were quite diverse, including *Rhizophora* spp., *Bruguiera* spp. (*Tumu/Tancang*), *Avicennia* spp. (*Api-api*) and *Nypa fruticans* (*Nipah*).

Uniqueness

The uniqueness of ecotourism development at Bira Village was not appropriate or not good with score value 25 according to the questionnaire. The uniqueness of Bira ecosystem value was calculated by paying attention to the flora and ecosystem which assessed by the existing in other place or not. The ecosystems at Bira Village were mangrove forest ecosystems,

these ecosystems were widely present in coastal areas of Indonesia that had suitable conditions.

Nature/Authenticity

The results of data analysis conducted based on questionnaire data showed that the nature/authenticity for ecotourism development at Bira is appropriate or good with score 75.8. Bira Village could be said still original or natural, but there are various efforts that must be controlled early because it may cause damage or change of land function which is not balanced with the nature.

Dangerous Biota

The results of data analysis showed that there was no dangerous biota for ecotourism development in Bira. It meant the location was very suitable or good with score value 100. Some respondents said that there was no dangerous biota that can threaten at Bira area.

Disaster Vulnerability

The results of data analysis conducted based on questionnaire data showed that the vulnerability of disaster for ecotourism development in Bira was very suitable or very good with score 83.5. In the last 5 years, there has never been a natural disaster that could damage Bira ecosystem.

Regional Status

The results of analysis showed that the status of Bira area for ecotourism development was very appropriate or very good with score 100. Some respondents said that Bira area was very suitable for ecotourism area.

Score assessment of ecological aspect in ecotourism development at Bira village of Makassar (Table 2). Based on the Table 2, it can be seen that the score obtained was 73.99 included in the appropriate or good category with the value of eligibility 62.52-81.25. Thus, it can be concluded that ecology in the development of ecotourism at Bira was appropriate or good. Based on the result of ecological eligibility criteria at Bira Village, the criteria of weighting conducted by using Expert Choice 2000as Statistic program for hierarchy analysis with the result presented in Figure 2.

Table 2. Ecological Aspect Scoring in Ecotourism Development at Bira Village of Makassar

Parameter	Score	Weight	Total
The diversity of natural resource	80.3	0.22	17.66
Uniqueness	25.0	0.24	6.00
Nature/authenticity	75.8	0.09	6.82
Dangerous biota	100	0.08	8.00
Disaster vulnerability	83.5	0.09	7.51
Regional status	100	0.28	28.0
Total		1.00	73.99
Assessment Category			Appropriate

Socio-economic Eligibility

Public Acceptance

Based on the results of questionnaire data analysis, the community gave a positive response by accepting the development of Bira area into a tourist area. From the data analysis, it was known that community approval for ecotourism development at Bira was very good (88.7). Although people's understanding was still very little about the concept of ecotourism, but the desire to get to involved and expected was huge.

Priorities with respect to:

Goal: STRATEGY OF ECOTOURISM DEVELOPMENT
>ECOLOGY

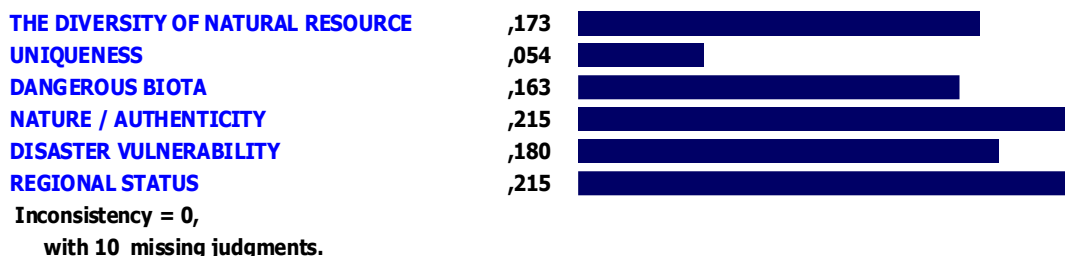


Figure 2. Weight the Value of Ecology Eligibility Criteria at Bira Village by Using Expert Choice 2000

Culture

Based on the results of the study, there are several cultural factors namely: understanding of traditional values, involvement in ritual events, involvement in cultural events and artistic attractions, involvement in race events and hopes for the preservation of customs and culture. It has been known that the value of the eligibility or achievement of the cultural factors from society to the development of ecotourism at Bira was good with score 80.0.

Level of education

Majority of Bira urban only have elementary to high school of education level. Based on the results of data analysis conducted, it can be seen that the achievement of educational factors of Bira community was not good that was 63.4.

Jobs

Based on the results of the questionnaire, the achievement of the employment factor for the development of ecotourism at Bira area was good with 62.50. The majority of people at Bira have the least education level of elementary school up to the first level of high school.

Security

The results of data analysis showed that the achievement of community and environmental security factors could support the development of ecotourism at Bira in a very good category, with value 84.50. The community was aware of the unavailability of environmental security facilities. Therefore, most people argued that the availability of security facilities was necessary at Bira area.

Based on the results of the analysis on socio-economic aspects, it can be concluded that the socio-economic aspects of ecotourism development at Bira village was accordingly shown in the following table 3, where the values obtained

were included in the appropriate category. Based on the result of socio-economic eligibility criteria at Bira, the criteria weighted by using Expert Choice 2000 with the result as Figure 3.

Table 3. Score of Socio-economic Aspect in Ecotourism Development at Bira village of Makassar

Parameter	Score	Weight	Total
Public acceptance	88.70	0.31	27.50
Culture	80.00	0.27	21.60
Level of education	63.40	0.05	3.17
Jobs	62.50	0.09	5.62
Security	84.50	0.28	23.66
Total		1.00	81.55
Assessment Category		Very Appropriate	

Eligibility of Infrastructure and Institutional Facilities

Accessibility and transportation

The accessibility level of a region is characterized by better road conditions linking an area with other areas. The results of questionnaires for accessibility and transportation factors obtained a score of 54.3 with less appropriate category. This was indicated by the absence of public transportation planned by the government, so the access to the area can only be reached by using private vehicle or using the motorcycle taxi service.

Electricity, telecommunication, clean water and garbage

Electricity; the data for electrical conditions at Bira obtained a score of 100 with very good category. Based on the results of the study, all respondents said they had used electricity in their homes. Because of this time, Bira has already facilitated a service from State Electric Company.

Telecommunication. The conditions of telecommunication obtained a score of 95 with very good category. Some respondents said that currently they still used home phone network.

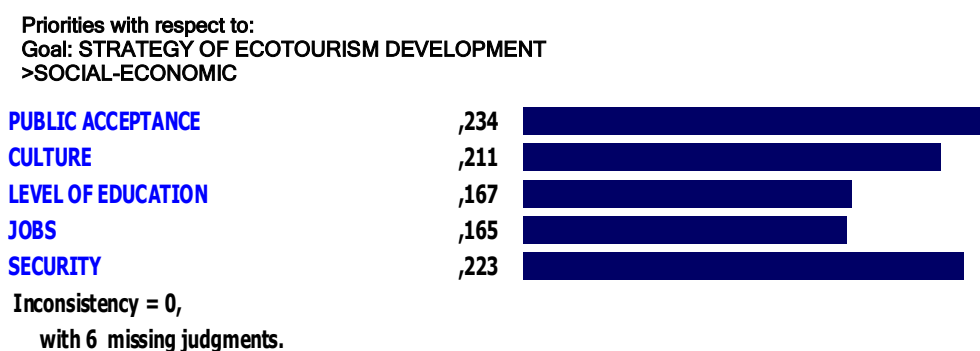


Figure 3. Weight the Value of Social-economic Eligibility Criteria at Bira Village by Using Expert Choice 2000

Clean water. Value score of clean water conditions in the region was 100 with the category of assessment was very good. The respondents said that they already had a clean water from regional company and water wells provided by the government

Garbage. Based on the results of questionnaires, handling of garbage in a score of 63.4 with good category. Handling waste was done by way of disposal to the garbage dump and then transported by the janitor.

Availability of Accommodation, Facilities and Tour Services

Currently the availability of accommodation was still limited independent efforts of the local community by renting rooms in their homes or in other words generally tourists will stay at residents' home. Because until now there has been no special lodging development to serve tourists who aim to stay because the tourists who come were still limited to a day visit.

Information, Promotion and Institutional Services

Bira area is planned as a mangrove ecotourism area by the Tourism Office of Makassar in 2011 and also supported by the policy of Regional and Space Planning (RSP) Makassar which is currently being proposed for the making of local regulations, which directs Bira area to be developed into a tourism area that utilizes the environment, especially mangrove forest.

Based on the results of research, supporting infrastructure at Bira has being available. That is why future tourism development is very easy to be implemented because it has been supported by adequate basic facilities.

Based on the result of the eligibility criteria of supporting infrastructure, the ecotourism at Bira was weighted by using Expert Choice 2000 with the following results in Figure 4. There are

several potential diversity of natural resources for ecotourism such as beaches, mangrove forests, rice fields, rivers and ponds (Table 5). One of biodiversity utilities for people is tourism [13]. Mangrove provide habitat for many animal species such as bird. Bird is one of animal group that potential for supporting ecotourism [14]. This kind of tourism is more sustainable when local people participation involve in the tourism management [7].

Table 4. Score Assessment of Supporting Infrastructure Aspect of Ecotourism Development at Bira village of Makassar

Parameter	Score	Weight	Total
Accessibility and transportation	54.3	0.41	22.26
Electricity	100	0.18	18.0
Clean Water	95.0	0.31	29.0
Telecommunications	100	0.05	5.0
Handling of garbage	63.4	0.05	3.17
Total		1.00	77.93
Assessment Category			Appropriate

Eligibility of Ecotourism Development in Bira Village

Based on the results of the questionnaire on the three criteria for the eligibility of ecotourism development such as ecology, socio-economic and supporting factors. It can be described in the analysis that these three criteria are important aspects of ecotourism development at Bira. The assessment of eligibility criteria of the three aspects can be seen in Table 6. While the the eligibility criteria of ecotourism development at Bira was weighted by using Expert Choice 2000 with the following results in Figure 5.

Table 6. Ecotourism Eligibility Development at Bira Village of Makassar in 2017

Parameter	Score	Weight	Total
Ecological aspect	73.99	0.50	37.00
Socio-economic	81.55	0.30	24.46
Supporting infrastructure	77.93	0.20	15.60
Total		1.00	77.06
Assessment Category			Appropriate

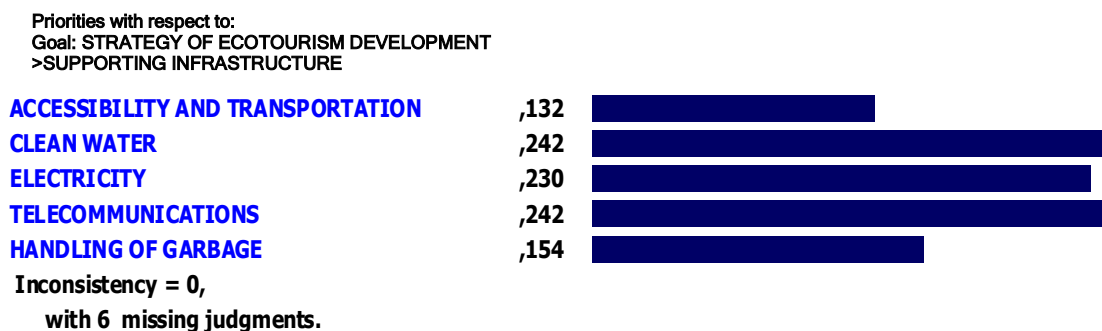


Figure 4. Weight of the Ecotourism Eligibility Criteria at Bira by Using Expert Choice 2000

Table5. The Analysis of Eligibility Criteria of Supporting infrastructure at Bira Village in 2017

No	Parameter	Appropriate Condition	Existing Condition
Ecology Criteria			
1	The diversity of natural resource	Good (5-6)	There are several potential natural resources of ecotourism such as beaches, mangrove forests, rice fields, rivers and ponds
	Uniqueness		In general the same as mangrove ecosystem in Indonesia
	Dangerous biota	No harmful biota	No harmful biota is found in the region
	Nature/authenticity	The condition is still natural	The condition is still natural even though there are some places that have got human intervention
	Regional characteristics	Loud and sandy/muddy	In the form of mangrove ecosystems and ponds that contains the river. Coastal characteristics tend to advance (increase) toward the sea due to sedimentation from the river
	Disaster vulnerability	Safe from disaster threats	Within 5 years there has never been a natural disaster
	Regional status	Conservation area	Including areas of utilization and rehabilitation
Socioeconomic Criteria			
2	Public acceptance	Very Good	The acceptance of the community is very good and supports the activity of the development of the area into a tourist area
	Culture and customs	Good	Cultural activities and customs are still often done by the community, especially ritual activities
	Education and understanding of ecotourism	Good	The level of community education is still low. Understanding in terms of ecotourism is also still minimal.
	Jobs	Good	Employment is still lacking and there is an opportunity for new and better jobs
	Security	Very Safe	Never experiences any internal or external conflict
Supporting Criteria			
3	Accessibility	Easy to access	Still needs additional facilities and infrastructure that support the development of ecotourism
	Clean water	Clean water was available	Clean water is available in the form of PDAM and dug wells
	Electricity	Available	The power grid has been well accommodated for one Bira village
	Telecommunication	Available	Telecommunication network is very good, has been available cellular telecommunication channel and signal pretty good.
	Institutional	There was a tourism management agency	The institutional system has not been well organized but there are various community institutions (LPM) that provide training.

Priorities with respect to:

Goal: STRATEGY OF ECOTOURISM DEVELOPMENT

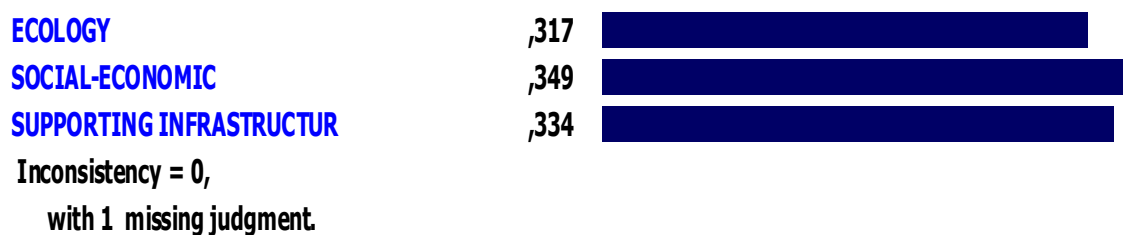


Figure 5. Weight of the Ecotourism Eligibility Criteria at Bira Village by Using Expert Choice 2000

Based on the results of the analysis of the three parameters of ecology, socio-economic and supporting factors, it can be concluded that the north coast areas of Bira Village are eligible and appropriate for the development of ecotourism. This can be seen from the criteria of the three aspects that suit and meet the qualifications or can be said *good*. To that end, Bira village that has been implemented village tourism program needs a suitable strategy to increase the capacity and the quality of the area into an area with tourism attraction, especially in terms of the development of tourist areas based on the environment, given the potential of natural resources in the region. Bira Village alone has an ecological function but also has an economical function so that in its development it is necessary to preserve it so that resources can still function to balance the environment and still be enjoyed by future generations. To achieve the ecotourism goal, socialization programs, promotion, cooperation, community participation in the event ecotourism that must emphasize supervision, conservation and protection of natural resource [6,7,15,16].

CONCLUSION

Based on the criteria analysis of the three parameters: ecological aspect, socio-economic aspect and supporting infrastructure aspect, it is concluded that Bira was eligible site for ecotourism development with the total value of 77.06.

REFERENCES

- [1] Pigram, J. J. and S. Wahab (Eds). 2005. Tourism, development and growth: the challenge of sustainability. Routledge.
- [2] Bunruamkaew, K. 2011. Site suitability evaluation for ecotourism using GIS and AHP: a case study of Surat Thani Province, Thailand. *Procedia - Social and Behavioral Sciences* 21, 269-278.
- [3] Wight, P. A. 2002. Supporting the principles of sustainable development in tourism and ecotourism: government's potential role. *Current Issues in Tourism* 5(3-4), 222-244.
- [4] Kumari, S., M.D. Behera and H.R. Tewari. 2010. Identification of potential ecotourism sites in West District, Sikkim using geospatial tools. *Tropical Ecology* 51(1), 75-85.
- [5] Pforr, C. 2001. Concepts of sustainable development, sustainable tourism, and ecotourism: Definitions, principles, and linkages. *Scandinavian Journal of Hospitality and Tourism* 1(1), 68-71.
- [6] Parmawati, R., A. S. Leksono, B. Yanuwadi and A. S. Kurnianto. 2017. Exploration of marine tourism in Watulimo, Trenggalek Regency: challenges, potentials, and development strategies. *Journal of Indonesian Tourism and Development Studies* 5(3), 175-184.
- [7] Antonius, A. Suman, A. S. Leksono, H. Riniwati. 2018. Ecotourism management strategy of peat swamp forest in Baning Nature Tourist Park Area in West Kalimantan Indonesia. *IOSR Journal of Business and Management* 20(1), 78-83.
- [8] Fennell, D.A. 2008. *Ecotourism: an introduction*, 3rd Ed. Routledge. New York.
- [9] Budiharsono, D. 2001. *Teknik analisis pembangunan wilayah pesisir dan lautan*. Prandnya Paramita. Jakarta.
- [10] Hakim, L. 2004. *Dasar-dasar ekowisata*. Bayumedia.
- [11] Bugisposonline. 2016. Visit Makassar and beyond 2013-2016. Available at: www.bugisposonline.com.
- [12] Clark, J.R. and R.V. Salm. 2000. *Marine And coastal protected areas*. International Union for Conservation of Nature and Natural Resources Gland. Switzerland.
- [13] Leksono, A.S. 2011. *Keanekaragaman hayati*. University of Brawijaya Press. Malang.
- [14] Muttaqien, H. Z., L. Hakim, A. S. Leksono. 2015. Analysis of bird diversity for supporting ecotourism development in Rajegwesi, Meru Betiri National Park. *Journal of Indonesian Tourism and Development Studies* 3(3), 105-110.
- [15] Hakim, L., M. Soemarno and S. K. Hong. 2012. Challenges for conserving biodiversity and developing sustainable island tourism in North Sulawesi Province, Indonesia. *Journal of Ecology and Environment* 35(2), 61-71.
- [16] Sebele, L. S. 2010. Community-based tourism ventures, benefits and challenges: Khama Rhino sanctuary trust, central district, Botswana. *Tourism Management* 31(1), 136-146.

Regional Economics: How does Tourism Influence Regional Revenue of Malang Raya?

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Abstract

This paper aims to analyze the influence of tourism sector to regional revenue of Malang Raya. In this case, tourism sector used the number of tourist arrival, hotel's room occupancy rate, the number of restaurants, and the sum of PDRB (Gross Regional Domestic Product) during the period of 2006-2016. The secondary panel data from three Local Governments in Malang Raya is analyzed by using fixed effect model of multiple regressions. The result shows that all independent variables simultaneously give significant influence to regional revenue. Partially, the number of tourist arrival and hotel's room occupancy rate give the significant influence to regional revenue. The other two variables, i.e. the number of restaurant and sum of PDRB did not give significant influence. A regression model of 97.76% is generated to predict regional revenue of Malang Raya. The conclusion gives an insight that local governments in Malang Raya should pay more attention to the effort of promoting Malang Raya to encourage tourist to come and stay longer, in order to increase the regional revenue and also to increase the share of the tourism sector to regional revenue.

Keywords: Malang Raya, regional revenue, tourism.

INTRODUCTION

Tourism has been the fastest growing sector in the world. UNWTO notes that tourism is a key to development, prosperity and well-being. As it is reported on tourism highlight 2017, Asia and the Pacific led growth in 2016. Furthermore, in South Asia, it is driven by Thailand, Vietnam, Indonesia, and Philippines. The fast growing is driven by the increase of disposable income (income after taxes). It gives more purchasing power in emerging economy market. The increased air connectivity, air capacity, more affordable travel and relaxation of visa encourage tourism demand from within and outside the region [1].

Indonesia predicts tourism export in 2019 will be the highest contributor [2]. The fast growing of tourism leads it as the core of economy in Indonesia. This is driven by the strong commitment of the tourism CEOs to develop tourism as the leading sector in the national development. The commitment is implemented in the Strategic Planning of Developing Tourism Destination and Industry in 2015 -2019 period by Indonesian Ministry of Tourism [3]. Furthermore, Indonesia's government puts tourism as a leading sector in national work-plans 2016. The national planning for developing national tourism is national plan for 2010-2025. It will develop 50 National

Tourism Destinations (NTD), 88 Strategic National Destination Areas (SNDA), and 222 Developing Destination Areas (DDA) [4].

East Java province has 3 NTDs, namely NTD Bromo-Malang, NTD Surabaya-Madura, and NTD Ijen-Alas Purwo. East Java also have 10 SNDAs inside the NTDs. National attention to East Java shows that this province has a great opportunity in developing tourism in the regions for the resources are spread out among regions. Responding to this attention, East Java province also planned its regional tourism development by delivering the Regional Planning for Tourism Development in East Java Province 1999/2000-2014/2015 [5].

Malang Raya as a tourism destination has been well-known for many periods. It is no doubt that Malang Raya has been famous for the cool atmosphere in east Java. Malang Raya is one of SNDAs in the national planning for developing national tourism. It also one of a region developed by East Java in the Regional Planning for Tourism Development. Malang Raya as a region consists of Malang region, Malang municipality, and Batu municipality. Location Quotients analysis done by the province in 2009 showed 14 regions and municipalities had the economic base on tourism sector. Based on the analysis, only Malang and Batu municipalities that had economic base on tourism sector in the context of Malang Raya [6]. It is an irony that Malang regency as a larger region with the more complete destinations did not have this base. However, nowadays, Malang regency is induced to develop tourism as the leading sector in the

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economic development. It is signed by the shift of primary sector into secondary and tertiary sector as reported in the Malang Regency's regional development planning in 2016-2021.

The development of tourism in Malang Raya can be seen from the rising of tourist arrivals in this region, as shown in Figure 1. Figure 1 shows that Malang Raya has been visited by the numerous tourists during the time. The positive trend of tourist arrival in Malang Raya shows the increasing tourism demand through the time. The demand leads to increase for tourism supply. Keynes argues that total income as a function of total employment. The higher national income, so does the volume of employment work. This volume depends on effective demand. Effective demand can determine the balance of employment and income. Effective demand includes the demand of consumption and investment [7].

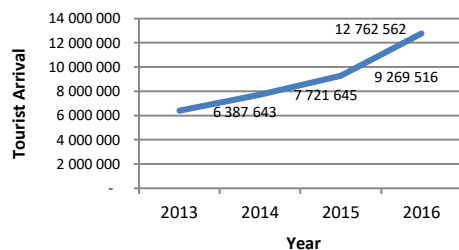


Figure 1. The Development of Tourist Arrival in Malang Raya 2013-2016. **Source:** Tourism Office of Malang Raya [8]

In case of tourism, effective demand can be translated into the demand of tourism product, shown by the tourism arrival, and demand of investment of private and public sector. The increasing of tourists' demands stimulates the rising of private and public investments. As a result, both national and regional and even local government will earn more income from the activities. The same opinion of Mishkin and Eakins that the main impact of tourism could be its contribution to the regional and local economy [9]. An increase number of tourist has gone hand in hand with development, rise in GDP, employment rates, rise in exports and economic activities [9]. Previous studies have also proved that the increase number of tourist gives the rise in regional revenue of DKI Jakarta [10], Gianyar region [11], and Local Governments (LGs) in Bali Province [12].

Tourism impact also gives a rise to the regional revenue of Malang Raya. It is shown by the earning of LG's revenue from optimizing local resources. Figure 2 gives the growth of regional revenue in Malang Raya. Figure 2 shows the

fluctuation growth with the declining trend. It is confront the development of tourist arrival that grew significantly and also the other tourism plants' development such as hotels, restaurants, infrastructures. Pitana and Diarta said that the main contribution of tourism is through taxes [13]. Regional revenue of Malang Raya is dominated by taxes, as shown in Figure 3a. Local taxes contribute up to 60% to the regional revenue. The positive trend shows the potential of local taxes role in Malang Raya. Local taxes in tourism sector can be defined as accommodation and restaurant taxes [14]. In Indonesia, tourism taxes are hotel, restaurant and entertainment taxes. Those taxes are directly related to the fulfillment of basic tourist demand in the destination. Share of tourism taxes can be seen in Figure 3b. Figure 3b shows the declining contribution of tourism taxes after 2010-2012, that is from 15% to 11%. Next, in 2012-2014, the contribution remains in 11%, and it starts to increase in 2015 and 2016. However, the rise still can't reach the previous share. Over all, the trend of tourism taxes is declining.

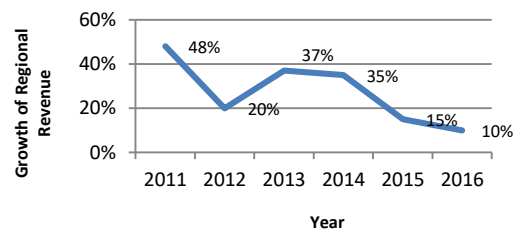


Figure 2. The Growth of PAD (Regional Revenue) in Malang Raya 2011-2016. **Source:** Regional Finance Bureau of Malang Raya [14].

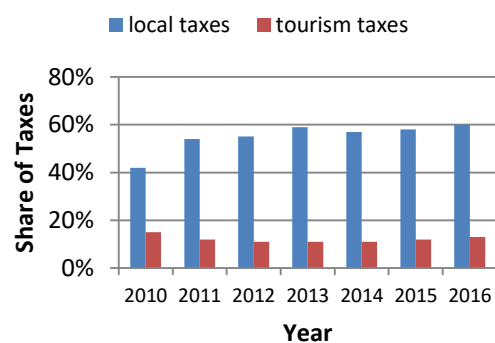


Figure 3. Share of Local Taxes and Tourism Taxes to PAD (Regional Revenue) in Malang Raya 2010-2016. **Source:** Regional Finance Bureau of Malang Raya [14].

It is important to study Tourism sector in Malang Raya for Tourism as a leading sector in Malang Raya. Malang Raya has the strong image of tourism that is being the concern of national

and regional developments. The writer finds gaps in the development of tourism sector and the share of tourism sector to PAD of Malang Raya. In the right hand, the development of tourism sector, such as the development of tourist arrival, the flowered accommodation, restaurant, destination, entertainment, and also the better public and tourism facilities. However, it can't make the contribution of this sector higher than non-tourism sector. It should give the positive correlation to regional revenue. Concerning to the gaps finding, the writer eager to study how tourism sector influences regional revenue of Malang Raya.

Malang Raya has been the emerging market for tourism industry in the East Java and also in national scale. Therefore demands of more study of tourism in the development are needed to investigate. This paper attempts to provide analyses of tourism sector influencing regional revenue of Malang Raya. A set panel data from three region and municipalities during 2006-2016 is applied. Four hypotheses including five variables are tested through multiple regressions. Four variables are being considered to give significant influence on regional revenue. The variables including the number of restaurant and sum of PDRB, those did not use in the previous study. This article's contribution is its examination on the earning of regional revenue and its determinant for Malang Raya as a single destination.

STUDY REVIEW

Decentralization in Indonesia is shown in form of territorial authority of Local Governments (LGs). As a result, LGs have to manage their region in order to reach the welfare of their society [15]. Development of regional economic can be varied of each area. This is made it possible that every LG can develop their region by the potentials they have. Economic activities of region can be divided into two categories that are basis and non-basis activities. Non-basis activities are economic activities to fulfill the need of local society. While basis activities is concern as an export activities, it doesn't depend on local demand [16]. The theory of export-basis was introduced by Richardson, which mentioned that tourism is a basis sector. It can deliver income from outside the region. Furthermore, tourism is also being the engine on other sector. It can be collaborated with primary, secondary or tertiary sector in order to have a quick development. It is the same idea with the growth

theory of Samuelson, i.e. turnpike theory. As it is cited in Tarigan [16], Samuelson suggested that the governments have to look at the competitive-advantage of any sectors they have in their region. The sector is important to create or fuel other sector to a fast development. Tourism sector, thus, can afford both theories.

According to Tribe [17], tourism is an activity in visiting for at least one night for leisure and holiday, business and professional or other tourism purposes. Visiting means a temporary movement to destinations outside the normal home and workplace. The visiting can be in group or individual [18]. Tourism is an activity engaged in by people who travel [19]. The traveler is called as tourist. Tourism activities include the guest and the host. The guest can be domestic tourist and international tourist. The host can be local people, local government, or private sector. Both also show the demand and supply side of tourism. Tourists demand tourism product to fulfill their need, want and hope. Tourism product is not a single product. It is a combination of many products both tangible and intangible that are bonded into tourism package. Tourism product, then, is produced by tourism industries. The industry also called tourism enterprises [18], travel industry and hospitality industry. Tourism industry has three travel plant, they are transportation, accommodation, food and beverage industries, and hospitality industry [20]. There are some important elements of tourism industry [21]. They are attractions, facilities, infrastructures, transportations, and hospitality. Tourism destination must have attractions. The tourist destination must have something to do, to see and to buy [22]. The tourist will experience through the travel by doing, seeing and buying something in the destination. The whole experience will lodge in their mind in form of memorable ones. Then, the activities of tourist will lead to the economic activity of the host.

Today, the host of destination made tourism to be the leading sector, the key of economy and also the core economy of some countries, such as Indonesia. It is the fact that tourism sector can be used as development tool. Since tourism resources are owned by the region, the development of tourism will give great impact to the regional and local economy. The impact will be the rise in GDP, employment rates, rise in exports and other economic activities [9]. Besides that, Tribe [17] also adds that tourism can lead to the prosperity. Tourism has become a

major source of economic diversification for many countries. It gives effective backward and forward linkages with the rest of the economy, allowing new employment and income earning opportunities [22,23]. The income earning opportunities are both for government, local people and private sector. LG have the benefit of regional income through taxation. Local taxes in tourism sector are hotel taxes, restaurant taxes, and entertainment taxes.

Regional revenue and tourism sector have been examined from various perspective, including financial data and tourism statistics. Most of studies proposed a multiple regression and develop it into a path analyses. Tourist arrival is being the main indicator of gaining income. Hotel room occupancy rate is also indicating the development of tourism and reflects the potential of local governments' revenue. Since, restaurant industry is also play important part in tourism, the number of restaurant also consider in the study for its role in the gaining of the revenue. This paper also use sum of PDRB(Gross Regional Domestic Product), by the reason that tourism sector also supported by all sectors in PDRB.

RESEARCH METHOD

Economic models are built to describe relationships between economic variables and predict the effects of changing these variables [17]. Models are generally simplified abstractions of the real world. They have two key components. First assumptions are made which build the foundations for the model. Second implications or outcomes are predicted by the working of the model. As the channel crossing becomes a more competitive environment, since the opening of the tunnel, the predictions of competition theory can be tested empirically, or in other words by making observations. The term *ceteris paribus* is often used in economic analysis, meaning all other things remaining unchanged. This is important because in the real world several factors often occur at the same time, some exaggerates a particular effect, and some countering it.

This research is done in Malang Raya. They are Malang municipality, Batu municipality, and Malang region. The data used are secondary data. They are LGs' regional revenues, the number of tourist arrivals, hotel's room occupancy rate, the number of restaurant, and sum of PDRB (Gross Regional Domestic Product)in 2006-2016. Source of data are from

finance bureau, tourism office, region statistic bureau, and other governments' reports in Malang Raya.

The method is quantitative approach by using panel data regression. It is used to identify the causal relationship between variables [24]. This research used the log-linear form of each variable to show the elasticity of them [25] or to get direct estimation of variables elasticity [24]. The log-linear model can predicted the partial elasticity of dependent variable (Y) towards independent variable (X) in the assumption of *ceteris paribus*. It shows every percentage change of Y's as the change of the percentage of X. the general model will be as follow:

$$\ln Y_{it} = \alpha + b_1 \ln X_{1it} + b_2 \ln X_{2it} + b_3 \ln X_{3it} + b_4 \ln X_{4it} + \varepsilon$$

Description:

Y	: LGs' regional revenue
X ₁	: The number of tourist arrival
X ₂	: Hotel Room Occupancy rate
X ₃	: The number of restaurant
X ₄	: Sum of PDRB
i	: region/municipalities i
t	: time period of t
α	: coefficient of the model
b ₁ , b ₂ , b ₃ , and b ₄	: coefficients of partial regression
ε	: error term

The data is estimated by using fixed effect model. Next, the simulant, partial and also R² test are done by p-value concept. The p-value used is 5%. Finally, the classical assumption tests are heteroscedasticity and multicollinearity. Hypotheses of this research are:

1. Tourism sector (the number of tourist arrival, hotel's room occupancy rate, the number of restaurant, and sum of PDRB) has significant influence on regional revenue
2. The number of tourist arrival has significant influence on regional revenue
3. Hotel's room occupancy rate has significant influence on regional revenue
4. The number of restaurant has significant influence on regional revenue
5. Sum of PDRB (Gross Regional Domestic Product)has significant influence on regional revenue

RESULT AND DISCUSSION

Malang Raya is a region in East Java consists of three local governments (LGs). They are Malang municipality, Batu municipality, and Malang region. Both municipalities are the development LG of Malang region, so they are bounded by the region, both territorially and

historically. The region is a mountainous one. It is famous for its cool air. It also has many water resources, rivers, and beaches. The soil is fertile, so Malang Raya is fit in agriculture activities. The abundant resources are also the capital for developing tourism sector. As shown in the LQ analysis by using PDRB 2011-2015, the basis sector of Malang Raya are in the agriculture, forestry and fishing; manufacturing; water supply, sewerage, and waste management and remediation activities; wholesale and retail trade, repair of motor vehicles and motorcycles; accommodation and food service activities; information and communication; financial and insurance activities; real estate; public administration and defense, compulsory social security; education; human wealth and social work activities; and other services activities.

Malang Raya as a single destination is determined by the regional tourism development plan of East Java. According to the plan, Malang Raya is a center of accommodation services, center of culture and sea attraction, center of natural attraction of mountainous area and center of convention venue [26]. Malang Raya is also the one of main services city. It has the role as the main gate and center of many activities, also its strategic role in the development of other regions [5]. Malang Raya has already famous as a tourism destination for it abundant tourism attractions. It has natural, cultural, and man-made tourist attraction. Malang Raya is easy to reach by air, road or water transportation. Malang Raya has an airport, bus station, and railway station as the main gate of tourist arrivals. It also supported by the number of accommodation and food services, that are claimed to be the most stered hotels in East Java [27]. Malang people are various ethnicities. However, they can live together in peace. They have their hospitality to every new people coming, including tourists. Those are potential of Malang Raya as a tourist destination.

Tourist arrival in Malang Raya contributes to the gain of regional revenue via entertainment tax, hotel tax and restaurant tax. The growth of entertainment tax is sharply fluctuating (Fig. 4). However, the number of tourist and also the new destination and event are flowering through the time. It indicates there are tax leakages. Share of entertainment tax shows gradual decreasing in the development of tourism sector in Malang Raya (Fig. 5). This may be caused by the gain from other new local taxes in regional revenue.



Figure 4. Growth of Entertainment Tax of Malang Raya 2011-2016. **Source:** Regional Finance Bureau of Malang Raya [14].

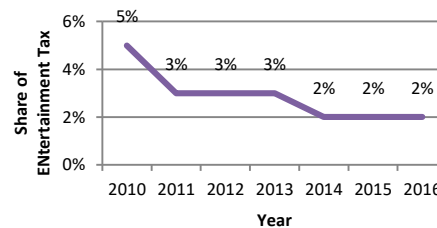


Figure 5. Share of Entertainment Tax of Malang Raya 2010-2016. **Source:** Regional Finance Bureau of Malang Raya [14].

The growth of hotel tax is also sharply fluctuating with the decreasing trend (Fig. 6). However, on the other side, the accommodation business is flourishing through the region. This can indicate that the effort in tax collection needs more improvement. On the other side, the share of hotel tax is good (Fig. 7). It keeps giving a constant share in the last three years.

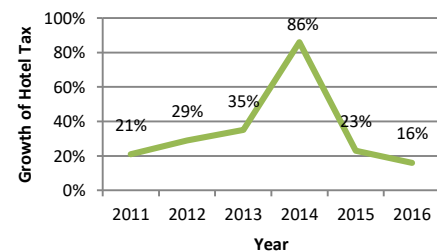


Figure 6. Growth of Hotel Tax of Malang Raya 2011-2016. **Source:** Regional Finance Bureau of Malang Raya [14].

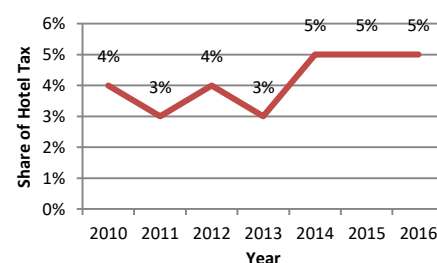


Figure 7. Share of Hotel Tax of Malang Raya 2010-2016. **Source:** Regional Finance Bureau of Malang Raya [14].

The growth of restaurant tax is fluctuating every year (Fig. 8). However, it gives an

increasing trend. This tax is very potential to be developed. Share of restaurant tax is smoothly fluctuating. A constant share of 5% is on the last two years (Fig. 9).

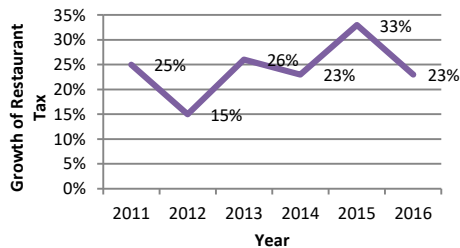


Figure 8. Growth of Restaurant Tax of Malang Raya 2011-2016. **Source:** Regional Finance Bureau of Malang Raya [14].

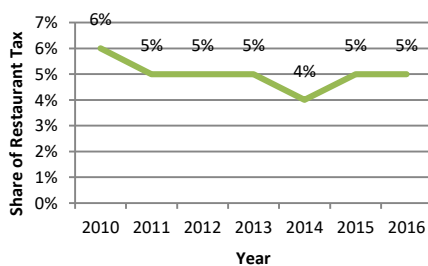


Figure 9. Share of Restaurant Tax of Malang Raya 2010-2016. **Source:** Regional Finance Bureau of Malang Raya [14].

Model Analysis

Result of data analysis using fixed effect model is resumed in Table 1. Table 1 show that simultaneously all independent variables are

giving significant influence on regional revenue. It is showed by the Probability of F-statistic is smaller than 5% (0.05), that is 0.00. Partially, there are two significant variables influencing regional revenue. They are tourist arrivals and hotel's room occupancy rate. Both have probabilities 0.00, smaller than p-value 5%. The other two variables, they are the number of restaurant and sum of PDRB do not giving a significant influence. Since both probabilities are bigger than 5%, they are 0.14 for the number of restaurant and 0.056 for sum of PDRB. The fitness of the model can be seen from the value of R-squared. The result shows that R-squared value is 0.9776. It means that 97.76% dependent variable can be explain by the independent variables/predictor in the model.

Classical assumption test as the requirement of regression analysis in this research are heteroscedasticity and multicollinearity tests. Heteroscedasticity test uses Glesjer test, by regressing the independent variables with residual absolute. If their p-value is bigger than 5%, so it is free from heteroscedasticity problem.

Table 2 showed the p-value of each predictor is bigger than 5%, so it is free from heteroscedasticity problem. Next, multicollinearity test uses correlation matrix as shown in Table 3. The result shows that there is no strong correlation between variables, so it is free from the multicollinearity problem.

Table 1. Resume of Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1973.011	4.472340	441.1584	0.0000
Number of tourist arrival	3.535095	0.229148	15.42713	0.0000
Hotel room Occupancy rate	1.478129	0.394086	3.750780	0.0009
Number of restaurant	0.637009	0.420109	1.516294	0.1415
Sum of PDRB	-0.404274	0.202307	-1.998315	0.0562
R-squared	0.977618			
F-statistic	189.2751			
Prob(F-statistic)	0.000000			

Source: Data Analysis, 2017.

Table 2. Resume of Glesjer Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.66E+10	1.62E+10	1.020970	0.3167
Number of tourist arrival	-7790.529	6326.991	-1.231317	0.2292
Hotel room occupancy rate	-1888233.	40670377	-0.046428	0.9633
Number of restaurant	-11658139	4.81E+08	-0.024258	0.9808
Sum of PDRB	1118389.	459362.5	2.434654	0.0221

Source: Data Analysis, 2017.

Table 3. Correlation Matrix

	Number of tourist arrival	Number of restaurant	Hotel room Occupancy rate	Sum of PDRB
Number of tourist arrival	1.000000	0.359207	0.851703	0.290663
Number of restaurant	0.359207	1.000000	0.422142	0.206617
Hotel room occupancy rate	0.851703	0.422142	1.000000	0.478487
Sum of PDRB	0.290663	0.206617	0.478487	1.000000

Source: Data Analysis, 2017.

Discussion

The model created based on the fixed effect is

$$Y = 1973.011 + 3.535 X_1 + 1.478 X_2 + 0.637 X_3 - 0.404 X_4$$

As the log-linear model can give the elasticity of Y to the change of X, the model can be interpreted as the following. First, coefficient of X_1 is 3.535. It means that every percent the increase in tourist arrival can give the increase in regional revenue for 3.535 percent *ceteris paribus*. Second, coefficient of X_2 is 1.478. It means that every percent the increase in hotel's room occupancy rate can give the increase in regional revenue for 1.478% *ceteris paribus*. Third, coefficient of X_3 is 0.637. It means that every percent the increase in the number of restaurant can give the increase in regional revenue for 0.637% *ceteris paribus*. The last, coefficient of X_4 is - 0.404. It means that every percent the increase in sum of PDRB will decrease regional revenue for 0.637% *ceteris paribus*.

The Influence of Number of Tourist Arrival

The significant influence of tourist arrival is consistent with Keynes theory that national income in line with consumption. It is also strengthened Wahab's opinion that tourist arrival and tourist consumption also contribute to the gain of local and regional government [28]. Since tourists are mostly not local people, their expenditure is categorized as an export gain for LGs. This is fitted the basis export theory by Richardson [29], that tourism is a basis activity because it can give income from other region; supported by other studies that in line with the result [10,11,12,30]. They found that tourist expenditure had been the income for government through taxation. However, the result is contradictive with several studies which found that tourist arrival is small because of the lack of promotion, bad facilities, and safety factor [31,32,33].

The significant influence of tourist arrival can be affected by some facts, both in demand and supply point of view. The demand side reflects

the need of tourist in conducting their travel. It is usually influenced by some factors, such as income, other prices, comparative quality or value added, fashion and tastes, advertising, opportunities for consumption, population, and other factors [17]. First, the increase of income makes people have more money to save and spend in leisure. Second, supplies of tourism products in Malang Raya are varied, so a competitive price of tourism package gives more choice for tourist. Third, tourist also compares the quality or value added in the package as they need to get. Forth, fashion and taste reflect the tourist behavior. It is usually influenced by culture, social status, personal characteristic and psychological aspects [19].

Keeping the relationship among families is being a culture in the society. The sense of ethnicity motivates the traveller to visit friend and relatives, go back to homeland, plus do other tourism activities. Personal characteristics such as age, occupation, lifestyle, personality, etc. affect the choice of doing leisure. For instance, the higher education of the society will increase the motivation to travel in order to have more experience and advance knowledge. Modern work activities identified as hard working activities, so the need of incentive travel is increase. While some professions need to travel as the activities, such as business man, civil servant duties, news reporter, etc.

Fifth, mass advertising of tourism destination lead more tourist to come. It also supported by the development of 4T (technology, transportation, trade and tourism). It gives more chance in wide range of promotion effort, promotes low cost carrier, and brings mass tourist. Sixth, opportunities for consumption can be seen from the increase of leisure time and human health condition. For instance, public policy in giving 5 days' school as well as 5 days' work beside the national holiday that has been scheduled give more chances to travel. The increase of human health condition, especially for pension, creates more travel in their leisure time. Seventh, the increase of population leads to migration. The

memories in the homeland and work land usually call back people to revisit. Finally, other factor, such implementation of school program in learning by doing and fun learning that is combined into education-tourism package led the student learning activities through tourism activities.

The supply side of tourism in Malang Raya can be seen from the development of tourism attraction, the flowered accommodation and restaurants, the better public facilities, transportation, and the hospitality of local people. Those developments attract more tourists to come. Various attractions, accommodation, transportation in various prices give them more choices to buy tourism package.

The Influence of Hotel Room Occupancy Rate

The significant influence of hotel occupancy rate support Wahab's view that tourist length of stay gives more income for local and regional government [28], in line with the other studies [12,34]. The significant influence of hotel occupancy rate can be identified as some facts. Tourists need accommodation to stay more days. Accommodation is a primary industry in tourism [18]. As a primary industry, it gives a primary contribution to hotel taxes for the LGs. Since, hotels are in the supply side, they are in line with the demand of tourist. Promotion effort of both the hotels owners and government creates more demands. Hotels can give interesting package for all segments of tourist. Hotels also cooperate with government and private sector in conducting regional, national and international events and festivals. The increase of MICE (Meeting, Incentive Convention, and Exhibition) activities holds by private and public organization also needs hotels and their facilities as the venue.

The Influence of the Number of Restaurant

Restaurant is a vital travel plant [20]. The important of restaurant in tourism also assessed by several studies [35-42]. However, there are no studies including the number of restaurant analyses to regional income. Here is the different of this study. The insignificant role of number of restaurant can be affected by some facts. First, culinary is developed into tourism attraction as a gastronomic product. Gastronomic product can attract tourist as in Bandung [42], Nordic countries [39] and other gastronomic destinations including Malang Raya. However, the rapid growing of these businesses doesn't follow by the collecting of the data. So the basis data for

the taxes can't be fulfilled. Second, the increase of foodies' traveller attracted on local traditional food. They eager to know local food, local receipt, cooked and eat locally with local people. This is of course can't contribute to LGs' revenue. Third, tourist motivation in visiting friend and relatives leads their relative serve their food and they don't go to restaurant. Fourth, the flourish of local street-food, local food-truck, small food services conducting by individual and household as the effect of the new opportunity in job creation and also high demand on food services doesn't contribute to LGs' revenue through restaurant taxes. Fifth, hotel giving all in package for its guest only give impact to the hotel taxes, not to the restaurant taxes.

The Influence of Sum of PDRB

At last, the insignificant PDRB of Malang Raya gives the insight that PDRB as a representation of total goods and services produced by the society, doesn't give a direct contribution to the tourism product that have role in regional revenue. It is fit the growth theory of Samuelson that is turnpike theory. Tourism sector is being the engine and fuelling other sectors to develop. As a result, the productivity of other sectors increases along with the development of tourism sector. A study found that PDRB can't contribute to LGs' revenue if tourists don't consume good food and services as a tourism product [32]. This could be the same condition as the result of this study. However it is contradictive with the previous studies that found PDRB can reflect the LGs revenue [30,31,43].

Implication of the Study

The growth of entertainment tax that sharply fluctuated and it decreasing share after 2010 are not in line with the result of this analyses that the number of tourist arrival give a significant influence on regional revenue. It is needed efforts to stabilize and continuously increasing the gain of entertainment taxes by optimizing the collection of the taxes. Next, the growth of hotel tax is fluctuating with the decreasing trend contradictive with the increasing share and significant influence of hotel room occupancy rate on regional revenue. These shows there are more potential of gaining hotel tax to be optimized. Meanwhile, the growth of restaurant tax is smooth fluctuating with the constant trend in line with the insignificant influence of the number of restaurant on regional revenue. However, it is also a potential one to be developed and optimized.

CONCLUSION

Malang Raya has a numerous potential as a destination. It has abundant of tourism resources such as nature, culture, and people. Those can attract tourists to visit. The tourist arrival in Malang raya gives a significant sign that they are very important in increasing regional revenue. The more tourists come, the more income for the region. Beside the tourist arrival, hotel's room occupancy rate also gives the significant role in determining regional revenue. Occupancy rate of hotels can show tourists' length of stay. Not only gives impact on hotel taxes, they also may take the role for other source of regional revenue. Since, the tourist also need food services, it should be also give a significant one. However, in this research, the number of restaurant still can't be one of variables that can predict the gain of regional revenue. It may be caused by not all tourist go to restaurant in their vacation. The sum of PDRB usually show the development of tourism sector through the productivity of region. However, not all products can give their direct contribution to the tourism product that have role in regional revenue. Based on the finding, governments in Malang Raya are expected to pay more attention to the effort of promoting Malang Raya to encourage tourist to come and stay longer in order to increase and giving more shares on regional revenue.

REFERENCES

- [1] UNWTO. 2017. UNWTO tourism highlights 2017. World Tourism Organization. Madrid.
- [2] Indonesian Ministry of Tourism. 2017. CEO message #18: tourism as the core of state economy. Ministry of Tourism. Jakarta.
- [3] Indonesian Ministry of Tourism. 2015. Strategic planning of destination and industry of tourism 2015-2019. Ministry of Tourism. Jakarta.
- [4] Government of Republic of Indonesia. 2011. Supplementary I Government Regulation of Republic of Indonesia No. 50 year 2011 about main planning of national tourism development 2010 – 2025, target of national tourism development 2010-2025. Government of Republic of Indonesia, Jakarta.
- [5] Provincial Government of East Java. 1998. Provincial Regulation of 1st Level Regional of East Java No. 16 year 1998 about main planning of 1st level regional tourism development East Java 1999/2000 – 2014/2015. Provincial Government of East Java, Surabaya. 1-24.
- [6] Afandi, A. 2014. Analisis *tourism livelihoods* berkelanjutan di Kota Batu: Pendekatan SLFT (Sustainable Livelihoods Framework For Tourism). Thesis. University of Brawijaya. Malang.
- [7] Adisasmita, R. 2013. Teori-teori pembangunan ekonomi dan pertumbuhan wilayah, 1stEd. Graha Ilmu. Yogyakarta.
- [8] Tourism Office of Malang Raya. 2017. Tourist arrival in Malang. Tourism Office of Malang Raya. Malang.
- [9] Osmankovic, J., R. Zrnic and V. Kenjic. 2010. Tourism-creator of the local and regional development. International Conference ICES 387, 1-15.
- [10] Arlina, R. and E. Y. Purwanti. 2013. Analisis penerimaan daerah dari industri pariwisata di Provinsi DKI Jakarta dan faktor-faktor yang mempengaruhinya. Diponegoro Journal of Economics 2(3),1-14.
- [11] Pertiwi, N. L. G. A. 2014. Pengaruh kunjungan wisatawan, retribusi obyek wisata dan PHR terhadap PAD Kabupaten Gianyar. E-Jurnal Ekonomi Pembangunan 3(3), 115–123.
- [12] Suastika, I. G. Y. and I. N. M. Yasa. 2015. Pengaruh jumlah kunjungan wisatawan, lama tinggal wisatawan dan tingkat hunian hotel terhadap Pendapatan Asli Daerah dan kesejahteraan masyarakat pada Kabupaten/Kota di Provinsi Bali. E-Jurnal Ekonomi Pembangunan 6(7), 1332-1362.
- [13] Pitana, I. G. and I. K. S. Diarta. 2009. Pengantar ilmu pariwisata. Penerbit Andi. Yogyakarta.
- [14] Regional Finance Bureau of Malang Raya. 2017. The growth of regional revenue 2011-2016. Regional Finance Bureau of Malang Raya. Malang.
- [15] Sabarno, H. 2008. Untaian pemikiran otonomi daerah: memandu otonomi daerah menjaga kesatuan bangsa. Sinar Grafika. Jakarta.
- [16] Tarigan, R. 2014. Ekonomi regional: teori dan aplikasi, revisi. Bumi Aksara. Jakarta.
- [17] Tribe, J. 2004. The economics of recreation, leisure and tourism, 3rd Ed. Elsevier. Oxford.
- [18] Yoeti, O. 1982. Pengantar ilmu pariwisata. Angkasa. Bandung.
- [19] Tan, A., Tse, E.C.Y. and C. L. Wong. 2009. Hospitality marketing. Education Bureau. Hongkong.

- [20] Pendi, N. S. 1994. Ilmu pariwisata sebuah pengantar perdana. Pradnya Paramita. Jakarta.
- [21] Spillane, J. J. 1989. Ekonomi pariwisata: sejarah dan prospeknya. Kanisius. Yogyakarta.
- [22] Bambang and Sunaryo. 2013. Kebijakan pembangunan destinasi pariwisata: konsep dan aplikasinya di Indonesia. Gava Media. Yogyakarta.
- [23] Ojo, J. S. 2014. Managing tourism for socio-economic development in Nigerian Local Government : a case study of Idanre Local Government. *Journal of African Studies Development* 6(February), 29-35.
- [24] Lagos, D. G. 1999. Exploratory forecasting methodologies for tourism demand. *Ekistic*, 394-396.
- [25] Gujarati, D. N. 2007. Dasar-dasar ekonometrika Vol 1, 3rd Ed. Erlangga. Jakarta.
- [26] Malang City Government. 2005. Pemerintah RPJPD Kota Malang Tahun 2005-2025. Malang City Government, Malang. 1-116.
- [27] Statistic Bureau of Batu City. 2016. Statistik perhotelan Kota Batu tahun 2016. Statistic Bureau of Batu City, Batu.
- [28] Wahab, S. 1992. Pemasaran pariwisata. Pradnya Paramita. Jakarta.
- [29] Richardson, R. B. 2010. The contribution of tourism to economic growth and food security. Food Security Collaborative Working Papers 97140, Department of Agricultural, Food, and Resource Economics, Michigan State University, East Lansing.
- [30] Dewi, A.A I. A. D. S. and I. K. G. Bendesa. 2013. Analisis pengaruh jumlah kunjungan wisatawan, dan produk domestik regional bruto terhadap Pendapatan Asli Daerah Kabupaten Gianyar. *E-Jurnal Ekonomi Pembangunan* 5(2), 260-275.
- [31] Jaya, G. B. P. and A. B. P. Widanta. 2014. Analisis faktor-faktor yang berpengaruh terhadap Pendapatan Asli Daerah (PAD) Kota Denpasar. *E-Jurnal Ekonomi Pembangunan* 3(5), 201-208.
- [32] Fariantin, E. and S. Amri. 2017. Analisis pengaruh sektor pariwisata dan PDRB (non migas-non pertanian) terhadap peningkatan PAD di Kabupaten Lombok Utara. *Jurnal Valid* 14(1), 46-52.
- [33] Widyaningsih, P. and M. K. S. Budhi. 2014. Pengaruh jumlah kunjungan wisatawan terhadap penerimaan pajak hotel, pajak restoran dan Pendapatan Asli Daerah. *E-Jurnal Ekonomi Pembangunan* 3(4), 155-163.
- [34] Hascaryo, D. L., S. Subanti and Pangadi. 2013. Pengaruh jumlah kunjungan wisatawan dan tingkat hunian hotel terhadap Pendapatan Asli Daerah berdasarkan kota di Provinsi Jawa Tengah dengan pendekatan *Fixed Effect Model*. Thesis. Department of Mathematics, Sebelas Maret University. Surakarta. 18.
- [35] Alatorre, M. M. 2016. Edible identities: food as cultural heritage. *Journal of Heritage Tourism* 11(2), 191-192.
- [36] Alderighi, M., C. Bianchi and E. Lorenzini. 2016. The impact of local food specialities on the decision to (re)visit a tourist destination: Market-expanding or business-stealing?. *Tourism Management* 57, 323-333.
- [37] Di Matteo, D. and G. Cavuta. 2015. Enogastronomic tourism: can it mitigate the intangibility of the destination? streetfood as a new business model for the management of tourist regions. *Procedia Economics and Finance* 39(November), 347-356.
- [38] Lan, L. W., W. W. Wu and Y. T. Lee. 2012. Promoting food tourism with Kansei cuisine design. *Procedia - Social Behavioural Sciences* 40(March), 609-615.
- [39] Lund, T. B., U. Kjærnes and L. Holm. 2017. Eating out in four Nordic countries: National patterns and social stratification. *Appetite* 119, 23-33.
- [40] Santeramo, F. G., A. Seccia and G. Nardone. 2017. The synergies of the Italian wine and tourism sectors. *Wine Economics and Policy* 6(1), 71-74.
- [41] Yusoff, N. M. M., S. M. Zahari, M. Z. M. Kutut and M. S. M. Sharif. 2013. Is Malaysian food important to local tour operators?. *Procedia - Social Behavioural Sciences* 105, 458-465.
- [42] Astuti, S. and H. Hanan. 2012. The behaviour of consumer society in consuming food at restaurants and cafes. *Procedia - Social Behavioural Sciences* 42(July), 429-435.
- [43] Sari, P. L. P. 2011. Analisis variabel-variabel yang mempengaruhi Pendapatan Asli Daerah (PAD) Provinsi Bali. *Jurnal Ilmiah Akuntansi dan Humanika* 2(2), 715-737.

Use of Macrozoobenthic for Water Quality Monitoring in Ecotourism Area of Prafi River, Manokwari, West Papua

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Abstract

The aim of research is to monitor the water quality of some ecotourism sites along Prafi Rivers (Manokwari, West Papua) using macrozoobenthic biotic index, Prati's index and some chemical-physical factors of water. Research was done from July to September 2016. Sampling was performed through Purposive Random Sampling. Macrozoobenthic was collected from each sampling sites in three locations, (upstream, middle stream, downstream) using Surber net and hand net. Water quality was categorized based on Implicit Prati's Pollution index that is derived from DO, BOD₅, pH, nitrate, orthophosphate, and water temperature values. Macrozoobenthic data was used to analyze the diversity index and six biotic indices. Result of the study showed that DO, BOD₅, pH and nitrate value in all location meet the standard quality for water based on PP. no 82, 2001 class II (fisheries, recreation, animals husbandry, and irrigation). The turbidity value in sites of upstream, middle stream and downstream Subsai and SP₃ have made the standard water quality according to WHO for drinking water (<5 NTU). Based on the Prati's index, the water quality was ranging from excellent to acceptable categories with value 0.4-1.9. The taxa richness of macrozoobenthic was 31 taxa. The Shannon-wiener diversity index in all stations were more than 2, indicated that the water was not polluted. The water quality of all station showed very excellent up to moderates (based on FBI), very excellent up to very bad (HBI), and excellent up to less polluted (ASPT). Percentage of Ephemeroptera, Plecoptera, and Trichoptera (% EPT) in all station up to 50% (excellent), except in station SP₃ upstream (40%). EPT richness value in all station excellent to moderate. It can be concluded that the water quality of Subsai in upstream, middle stream, downstream and downstream of SP₃ was excellent. The middle stream of SP₃ and middle stream of SP₁ has moderate quality, while the water quality in SP₃ upstream, SP₁ upstream and SP₁ downstream was bad.

Keywords: Ecotourism, Prafi River, water quality.

INTRODUCTION

Ecotourism is the form of tourism with sustainable environmental principles. The regulation aspect of ecotourism development in Indonesia was based on Environmental Law no. 4, 1982, in which the aims of ecotourism is promoting the wide use of natural resources [1]. Subsai River, Prafi 1 River Reservoir (SP₁) and Prafi 3 River Reservoir (SP₃) is the river and reservoir which are used as a tourism sites in Manokwari, West Papua. A far, the natural and infrastructure potentials for tourism was poorly managed by local government. It is shown by the absent of regulation on the use of natural resources and infrastructure for tourism attraction. These rivers and reservoir were used as tourism attraction by local community in West Papua, with numerous tourist activities like bathing, swimming and fishing. The water also used to support ponds and pools, in which it is

also involved in tourism industry in Manokwari. SP₁ reservoir is used as tourism sites, besides that, there is an exploration of stone, gravel and sand by community from Manokwari. Problems in tourism sites often related to the tourist activity which are contributes to the environmental aspect. A lot of tourist number of tourism sites rarely controlled and examined, leading the difficulties in recreation sites management. There is also poor carrying-capacity-based management. These aspects potentially contribute to environmental degradation in tourism sites, including water and its hydrological systems [2].

Management of Subsai Rivers and reservoir as a water resources capital is important, especially in the perspective of sustainable uses. Therefore it is crucial to perform water resources quality using biological indicator and characteristic of its physical and chemical aspects. Chemical and physical examination will inform factual condition of water quality. The limitation of chemical and physical examination is, however, related to the cost. Limited budget becomes the problem for complete examination of chemical and physical aspect of water quality [3]. Biological techniques can be alternative

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methods to examine water quality, especially in the perspectives of sustainability of water environment management. Some advantages using biological control includes easy in implementation, rapid and low cost. This approach also able to provide picture of water quality because characteristics of biotic organism is fast in responding pollutant and environmental changes [4]. Biological analysis can be done properly using information of biotic community structure and indices analysis [5]. Community structure of macrozoobenthic is sensitive to environments that affect the quality of water.

The species of macrozoobenthic has different tolerant degree to environmental changes and therefore able to use in water quality assessment [6]. There are some indices available to uses complementarily with macrozoobenthic analysis to examine level of organic pollution in water environment, including FBI (Family Biotic Index) and HBI (Hilsenhoff Biotic Index) while ASPT index (Average Score Per Taxa) was used to identify level of toxic material pollution [7]. In practices, some Insect group from Ephemeroptera, Plecoptera and Trichoptera able to indicates the excellent water quality [8]. The Prati's implicit Index was used to analyze physical and chemical parameters that are used to identify level of pollution of water ecosystem based on DO, BOD, pH, Nitrate and Phosphate data [9,10].

RESEARCH METHOD

Study Area

Sampling sites was developed using Purposive Random Sampling [11]. Sample collection was collected in the beginning in summer in three location, namely Subsay River, (SP₁) and (SP₃) (Fig. 1). Sample was collected from three points (upstream, middle stream and downstream) with distance between points was 10 m. There are totally 9 observed stations in this study.

Macrozoobenthic Collections and Evaluation of Water Physical and Chemical Quality

Macrozoobenthic with habitats of stone and gravels was sampled using Surber net and macrozoobenthic in riparian habitat using hand net. These samples were collected and separated from debris using plastic disk. Sample was done until at least 100 individual of macrozoobenthic in each station was collected to calculate biotic index value [7]. The sampled macrozoobenthos organism was collected in flacon bottle with 70% alcohol. The collected sample of macrozoobenthic was identified with microscopy

examination. Identification was done using identification keys of macrozoobenthic [8,12,13].

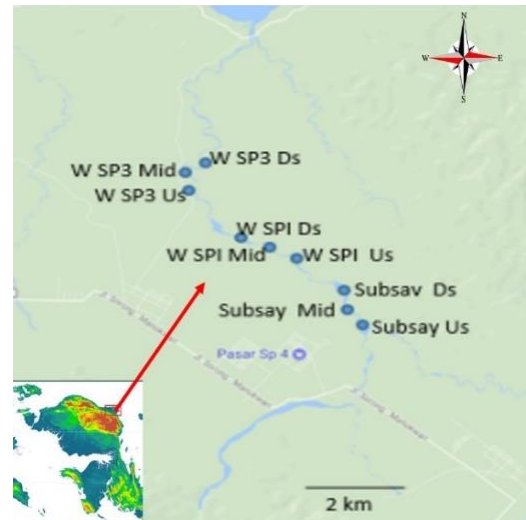


Figure 1. Sampling sites location at Prafi River, Manokwari

Description:

- Us = Upstream
- Mid = Middle stream
- Ds = Downstream
- SP₁ = Prafi 1 River Reservoir
- SP₃ = Prafi 3 River Reservoir

The examination of physical and chemical water quality in field was includes: temperature (examined using thermometers), (pH examined using pH meter), DO (examined using DO meter and turbidity (using turbidity meter). The BOD₅, nitrate and orthophosphate was analyzed in laboratory. Nitrate and orthophosphate were examined using spectrophotometer. Nitrate was analyzed using spectrophotometer with wave length 410 nm using Brusin methods, while orthophosphate was analyzed in wave length 690 nm with Stannous chloride methods [9]. Cluster and Biplot analysis based on biotic indices was done using PAST program [14].

RESULT AND DISCUSSION

Physical and Chemical Aspects

From nine observed stations, pH ranges from 7.55 to 8.46 (Fig. 2). These value has been meet water quality standard class II (water for recreation, fisheries, animal husbandry, and irrigation) in PP. No. 82, 2001 which mentioned pH value ranges from 6 to 9. The highest pH value was 8.46 found at SP₁ upstream and the lowest 7.55 found at Subsay middle stream and downstream. Increase of pH in SP₁ and SP₃ upstream caused by the increase of detergent application by community in Manokwari and its surrounding area. Detergent was used in washing. Increase of detergent in water

ecosystem increase the water pH; potentially it can reach 10 to 11 [4]. The pH of water was determined by the ability of water to release and bind hydrogen ions and level of ionized ammonium influence pH become low [15].

Result of the Dissolved Oxygen (DO) from nine station shows DO ranges from 7.93 mg.L⁻¹ to 9.43 mg.L⁻¹ (Fig. 2). According to national water standardization, this value has meet the water class II. According to PP. No. 82, 2001, the DO should be more than 4 mg.L⁻¹ [16]. The highest DO was 9.43 mg.L⁻¹ found in Subsary middle stream station. This can be caused by the area along the station that has good vegetation. The lowest value (7.93 mg.L⁻¹) found in SP₁ upstream. This is potentially is the effect of open area and absent of vegetation. In freshwater ecosystem, dissolved oxygen was influenced by temperature, in which in 0°C dissolved oxygen was 14.16 mg.L⁻¹, O₂ concentration decrease with the increase of water temperature [17]. Dissolved oxygen in water was caused by the contact of water surface with atmosphere and photosynthesis process

[18]. Loss of oxygen from water ecosystem occurs through oxygen release from atmospheric and respiration activity of aquatic organism [19].

The Biochemical Oxygen Demand (BOD) value of nine station was range from 0.44 mg.L⁻¹ to 4.57 mg.L⁻¹ (Fig. 2). These value were beyond the standard value of recommended BOD, in which governmental regulation through PP. No. 82, 2001 which state that BOD should < 3 mg.L⁻¹ [16]. The highest value of BOD (4.57 mg.L⁻¹) was found in station SP₁ downstream. It is caused by human activity (e.g. bathing, washing) that cause aerobes microorganism consume more oxygen, especially in its activity to decay an-organic compound resulted from its activity. The lowest BOD was 0.44 mg.L⁻¹ found in Subsary middle stream station, represent there are human activity in the sites but in low intensity. BOD shows amount of oxygen in water that are able to consumed by aerobes microorganism in oxidize organic material in particular environment caused by human activity (e.g. bathing, washing) in river [20].

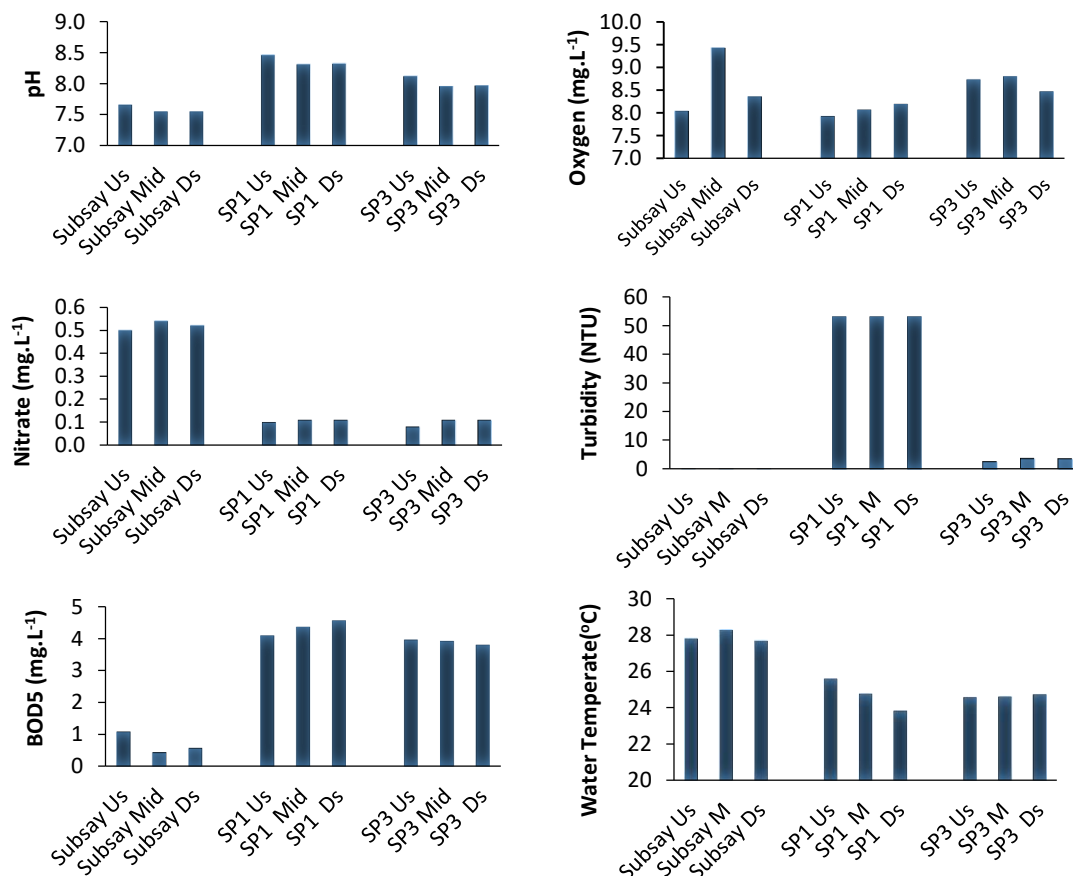


Figure 2. Mean Values of pH, Oxygen, Nitrate, Turbidity, BOD₅, and Water Temperature in Study Area
Description: Us = Upstream, Mid = Middle stream, Ds = Downstream, SP₁ = Prafi 1 River Reservoir, and SP₃ = Prafi 3 River Reservoir.

The evaluation of Nitrates from nine stations are ranging from 0.08 mg.L⁻¹ to 0.54 mg.L⁻¹ (Fig. 2). According to PP. No. 82, 2001, this value in ranges of water quality class II, in which Nitrates less than 10 mg.L⁻¹ [16]. The highest nitrate value was 0.54 mg.L⁻¹ found in Subsay middle stream station and the lowest 0.08 mg.L⁻¹ was found in SP₃ upstream. Nitrate is the stable nitrogen that needed by organism for protein synthesis. The level and concentration of nitrates in water influence the growth of algae [21].

The turbidity evaluation of nine station ranges from 0.12 to 53.27 NTU (Fig. 2). Turbidity value in all Subsay stations and all SP₃ stations meet the maximum standard of water turbidity according to WHO for drinking water (< 5 NTU) [22]. Turbidity value from SP₁ upstream to SP₁ downstream were 53.27 NTU, 53.20 NTU and 53.23 NTU, consecutively. The high turbidity value in observed area was caused by sand exploitation and human activity (e.g. bathing). Turbidity is the important abiotic factors in water ecosystem that related to the sedimentation phenomena. Turbidity has significant impact to the organism live in water ecosystem [23].

Result of the temperature monitoring in all observed station ranges from 23.83°C to 28.27°C (Fig 2). The highest temperature was 28.27°C found in Subsay middle stream station. It is caused by less of plant canopy factors in this sites, lead the decrease and low sunlight that directly penetrate the water body. The lowest temperature was 23.83°C, found in SP₁ downstream station. It caused by sample time in the afternoon time [24]. Temperature pattern in aquatic ecosystem was influenced by some factors, including sunlight intensity, hot energy changes between water and its surrounding environment, altitude and tree canopy in riparian area [25].

From the calculation of Prati'S Implicit Index, it is found that pH, BOD₅, Nitrate and orthophosphate from nine observed station classified as Excellent to Acceptable [26] with value ranges from 0.42 to 1.94 (Fig 3). The high value index shows that water quality was bad. The value of Prati's index was shown in SP₁ downstream station, with ranges value 1.94 and the lowest found in Subsay downstream station with value 0.42. From this data, it is shown that station SP₁ is the sites with low water quality compared to the Subsay and SP₃ station. This is caused by the level of DO (%) in this station was low.

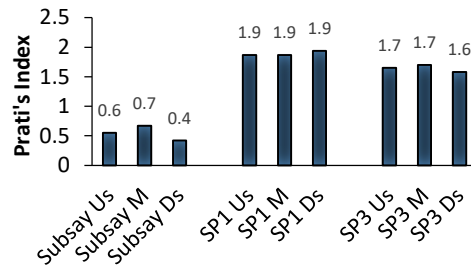


Figure 3. Water quality in all observed station based on Prati'S Implicit Index.

Description: Us = Upstream, Mid = Middle stream, Ds = Downstream, SP1 = Prafi 1 River Reservoir, and SP3 = Prafi 3 River Reservoir.

Profiles of Community Structure and Macro-Zoobenthicbiotic Index

There are 31 macrozoobenthic taxa found in all observed stations. It is consist of 7 Classes, including: Platyhelminthes, Coleoptera, Diptera, Ephemeroptera, Odonata, Plecoptera and Trichoptera (Table 1). There are variations of macrozoobenthic in each taxa, and not all taxa was found similarly in all stations (Fig. 4 and Table 1). The Subsay upstream station has the highest macrozoobenthic taxa (17), while the lowest found in SP₃ middle stream (10). Increase of taxa number in Subsay upstream and SP₁ middle stream stations was related to the increase of organic materials nutrients resulted from the natural process, including debris of organic mater from dead trees [27,28,29].

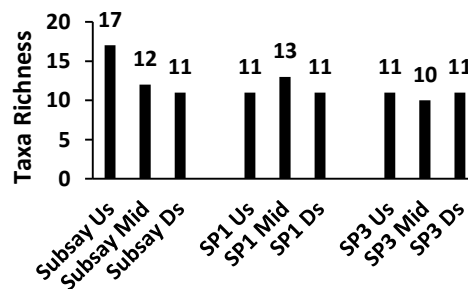


Figure 4. Variation of Spatial distribution Taxa Richness the of Macrozoobenthic in Study Site

Description: Us = Upstream, Mid = Middle stream, Ds = Downstream, SP1 = Prafi 1 River Reservoir, and SP3 = Prafi 3 River Reservoir.

Decrease of taxa number in Subsay middle stream, Subsay downstream, all SP₁ stations, and all SP₃ stations was related to the increase content of detergent which is released to the water environment through human activity, including agricultural activity, recreation activity and daily life human activity in the observed sites. From all observed sites, sensitive

macrozoobenthic to pollution were found. It is including Ephemeroptera, Plecoptera and Trichoptera [30,31]. The existence of these taxa in water ecosystem indicates that the water quality was excellent [32].

The Shannon–wiener diversity index of macrozoobenthic found in all observed station ranges from 2.33 – 3.11 (Table 2). Based on the index value, it is shown that the water was not polluted, as shown by $H > 2$ [33,34]. This diversity index is one of the accurate index to examine level of pollution in water ecosystem caused by toxic materials [35]. The Family Biotic Index (FBI) value of macrozoobenthic shows level of pollution caused by organic matter. FBI value in all observed station ranges from 3.09 – 5.18

(Table 2). Water quality in all station was grouped into three criteria, including very excellent, excellent and moderates [30]. All Subsay stations, SP₃ middle stream and SP₃ downstream stations grouped into sites with excellent water, all SP₁ tations was excellent, while SP₃ upstream station was moderates. It is caused by the high human activity in river, including recreation, bathing and washing. There also impact of agricultural activity with application of chemical fertilizer and pesticides surrounding SP₃ stations [36]. Therefore, there are policy and attention needed to control and properly manage these sites towards excellent water ecosystem quality.

Table 1. Spatial Distribution of Macrozoobenthic in the Study Sites

Ordo	Family	Genus/Species	Sampling Site											
			Subsay			SP ₁			SP ₃					
			Us	M	Ds	Us	M	Ds	Us	M	Ds			
Planaria	Planariidae	<i>Planaria</i> sp	+		+									
Coleoptera	Hydrophilidae	<i>Tropisternus</i> sp				+			+					
	Curculionidae	undertermined			+									
	Elmidae	undertermined	+	+										
	Ptilodactylidae	undertermined					+		+					
	Psephenidae	<i>Ectopria</i> sp	+				+							
	Staphylinidae	undertermined	+											
Diptera	Ceratopogonidae	<i>Ceratopogon</i> sp	+	+	+	+	+	+	+	+	+	+	+	+
	Chironomidae	<i>Chironomus</i> sp					+	+	+	+	+	+	+	+
	Simuliidae	<i>Simulium</i> sp	+	+	+					+	+	+	+	+
	Syrphidae	<i>Eristalis</i> sp	+											
	Tipulidae	<i>Tipula</i> sp						+						+
Ephemeroptera	Baetidae	<i>Acentrella</i> sp					+	+	+	+	+	+	+	+
	Baetidae	<i>Baetis</i> sp	+	+	+	+	+	+	+	+	+	+	+	+
	Caenidae	<i>Caenis</i> sp	+	+	+	+	+	+	+	+	+	+	+	+
	Ephemerellidae	<i>Ephemerella</i> sp	+											
	Heptageniidae	<i>Epeorus</i> sp											+	
	Pothamintidae	<i>Potamanthus</i> sp			+	+								
Odonata	Belastomatidae	<i>Belastoma</i> sp	+	+						+				+
	Chlorocyphidae	undertermined	+	+										
	Corduliidae	<i>Macromia</i> sp		+										
	Gomphidae	undertermined	+	+	+						+	+		
	Libellulidae	<i>Orthetrum</i> sp					+	+	+					+
	Protoneuridae	undertermined	+		+									
Plecoptera	Perlidae	undertermined												+
Tricophtera	Glossosomatidae	undertermined						+						
	Hydropsychidae	<i>Hydropsyche</i> sp	+	+	+	+	+	+	+	+	+	+	+	+
	Hydroptilidae	<i>Tropilaelaps</i> sp						+						
	Lepidostomatidae	<i>Halesus</i> sp	+	+	+	+					+	+	+	+
	Psychomyiidae	undertermined						+			+			
	Rhyacophilidae	<i>Rhyacophila</i> sp	+					+			+	+		
	Sericostomatidae	undertermined					+	+						

Notes: + = presence, Us = Upstream, M = Middle Stream, Ds = Downstream, SP₁ = Prafi 1 River Reservoir, and SP₃ = Prafi 3 River Reservoir.

Table 2. The Water Quality of Prafi River based on Some Biotic Index of Macrozoobenthic

Station	H'	ASPT	TR	FBI	HBI	% EPT	% Chi
Subsaya Upstream	2.73/E	7.00/E	6/G	3.09/E	4.00/VG	62.20	0
Subsaya Middle stream	2.84/E	7.13/E	4/F	3.75/E	4.54/G	73.15	0
Subsaya Downstream	2.68/E	7.00/F	5/F	3.66/E	4.40/VG	75.81	0
SP ₁ Upstream	2.70/E	5.56/G	6/G	4.65/G	6.28/F	65.00	25.00
SP ₁ Middle stream	2.72/E	6.00/G	10/G	4.46/G	5.74/F	74.79	18.49
SP ₁ Downstream	2.60/E	5.00/G	4/F	4.91/G	6.53/FP	63.79	25.86
SP ₃ Upstream	2.49/E	6.00/G	7/G	5.18/F	5.53/F	40.17	18.80
SP ₃ Middle stream	3.11/E	6.86/E	7/G	3.56/E	4.09/VG	80.20	4.99
SP ₃ Downstream	2.33/E	6.11/E	6/G	3.16/E	3.91/VG	78.46	12.31

Notes:

SP₁ = Prafi 1 River Reservoir and SP₃ = Prafi 3 River Reservoir. Water quality category: Excellent (E); Very Good (VG); Good (good); Fair (F); Fairly Poor (FP); H' = Shannon- Wiener Diversity Index, ASPT = Average Score per Taxa, TR = Taxa Richness, FBI = Family Biotic Index, HBI = Hilsenhoff Biotic Index, EPT = Ephemeroptera Plecoptera and Trichoptera, Chi = Chironomidae [30-34, 37].

Effort to increase excellent water quality should be promoted, while regulation in the area which able to minimize water ecosystem threats should be well developed. Hilsenhoff Biotic Index (HBI) value of macrozoobenthic is the index that shows the level of pollution of water ecosystem by organic matter until species level. Result of the HBI value of all station ranges from 3.91 – 6.53 (Table 2). Water quality in all station was grouped into four criteria, i.e. very excellent, excellent, moderates and bad [30]. The Subsaya upstream, Subsaya downstream, SP₃ middle stream and SP₃ downstream station was classified into very excellent, while Subsaya middle stream was excellent. SP₁ upstream, SP₁ middle stream and SP₃ upstream stations were moderates, while SP₁ downstream was bad. This is potentially occurs due to human visitation as tourist in water ecosystem and its recreation activity, especially in sites which area is accessible for tourist. In such area, there are waste produced by tourism activities. This result shows that water quality analysis with HBI consistent with result analysis based on FBI [30].

The Average Score per Taxa (ASPT) of macrozoobenthic is one of the index that able to show the water quality. The calculation of ASPT in all observed stations shows that the index range is 5.00-7.13 (Table 2). Water quality in all observed stations were grouped into two category; clean water (>6) and low polluted water (5-6) [30,37]. In Subsaya, SP₃ middle stream and SP₃ downstream were grouped as freshwater. The water in SP₃ upstream and all SP₁ stations are low polluted. Human activity in observed stations area, including agriculture with chemical fertilizer and pesticides, stone and sand exploitation for construction material, and poor management of waste, high number of visitors, fishing and other recreational activities contributes to the pollution of the observed sites [36].

The Ephemeroptera Plecoptera and Trichoptera (EPT) value of macrozoobenthic based on the calculation of all observed station more than 50%, except in station SP₃ upstream (Table 2). The high value of EPT (more than 50%) shows the excellent quality of water ecosystem [7]. The high value of EPT can be resulted from the abundance vegetation in riparian area of the river ecosystem. The nutrition to support macrozoobenthic lives in water ecosystem can be provided by vegetation in riparian ecosystem along the river [30,31].

The EPT taxa richness (EPT richness) in all observed stations was given in Table 2. There are 10 taxa in SP₁ middle station, 7 taxa in SP₃ upstream and SP₃ middle stream, 6 taxa in Subsaya upstream, SP₁ upstream, and SP₃ downstream stations, 5 taxa in Subsaya downstream station, and 4 taxa Subsaya middle stream and SP₁ downstream stations. The taxa richness (EPT) ranges from 6-10, shows the water ecosystem is good (slight impact), while value of EPT richness between 2-5 is categorized as fair (moderate impact). Based on the EPT analysis, there are 6 locations with low pollution of organic materials, and 3 locations with organic pollution in medium level [30,31,38].

Water Quality Groups in Observation Sites based on Macrozoobenthic Biotic index and Principal Component Analysis

Water quality in recreation sites area based on Macrozoobenthic biotic indices was classified into six category (Fig. 5). All Subsaya stations were characterized by the high value of H' and ASPT, taxa richness, moderate Chironomidae and low HBI. The high value of H' and ASPT shows absent of toxic compound in water environment, while the low FBI and moderate HBI shows less pollution by organic matter in normal level [30,33,34]. Based on the taxa richness, there is indication of organic matter pollution in low

level. It can be said that this water has no pollution in observed water ecosystem or in an excellent quality [30].

The SP₃ downstream station has high H' and ASPT, with moderates taxa richness and Chironomidae. The high value of H', ASPT and taxa richness was characterized by the absent of pollutant materials, especially anorganic or toxic materials, while the moderate value of Chironomidae shows relatively low organic pollutant [6,30,33,34,39,40]. It can be said that the water in observed station has been slightly polluted by organic matter. It is because there is small-scale agricultural activity with application of chemical fertilizer and pesticides surrounding the station [36].

The station of SP₃ middle stream has high H', ASPT and taxa richness, and low Chironomidae, FBI and HBI. Based on these high value of H', ASPT and taxa richness, this observed station can be said has no toxic pollutant and Chironomidae. The low value of FBI and HBI shows the low number of organic pollutant. Therefore, there has been pollution by organic pollutant in low level. It is caused by the high activity of human activity in river, including recreation, bathing and washing [36]. The Chironomidae is a pollution-tolerant taxa and the presence of these taxa may indicate moderate to poor water quality [6,30,39,40].

The station SP₁ middle stream has high H' and taxa richness, moderates ASPT, and low value of

FBI, Chironomidae and HBI. Based on the high value of H' and taxa richness in this station, it can be estimates that there are no pollution from toxic material [35]. The value of ASPT indicates slight pollution from anorganic compound. The low value of Chironomidae, FBI and HBI shows the low to moderate level of organic matter pollutant in water ecosystem [30]. These can be said that there are pollution in moderate level in observed station. It is caused by the high activity of human activity in river, including recreation, bathing and washing [36]. The Chironomidae is a pollution-tolerant taxa and the presence of these taxa may indicate moderate to poor water quality [6,30,39,40].

Station of SP₃ upstream has high value of HBI, FBI and Chironomidae. The taxa richness was moderate while H' and ASPT was low. Based on the high value of HBI, FBI and Chironomidae with moderate value of taxa richness, this station can be identified with low to medium pollution caused by organic compound [30]. The low value of ASPT shows a slight pollution of anorganic matter. Therefore, it can be conclude that this station was polluted by organic compoud in medium level [30]. It is caused by the high numbers of human activity in river, including recreation, bathing and washing. There also impact of agricultural activity with application of chemical fertilizer and pesticides in the surrounding area of the station [36,38].

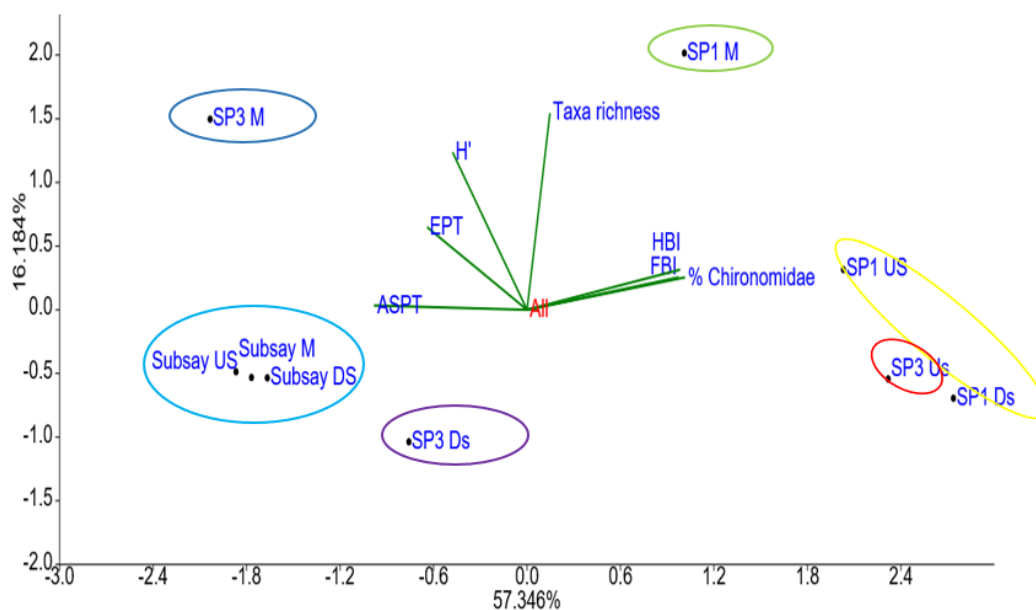


Figure 5. Principal Component Analysis (PCA) based on Macrozoobenthic Indices

Description: Us = Upstream, M = Middle Stream, Ds = Downstream, SP1 = Prafi 1 River Reservoir, and SP3 = Prafi 3 River Reservoir, H' = Shannon- Wiener Diversity Index, ASPT = Average Score per Taxa, FBI = Family Biotic Index, HBI = Hilsenhoff Biotic Index, EPT = Ephemeroptera Plecoptera and Trichoptera.

SP₁ upstream and SP₁ downstream stations has high HBI and Chironomidae value, medium taxa richness and FBI and low ASPT and H'. Based on these analysis, it can be said that these station has been moderately polluted by organic matter, while low ASPT shows the slight anorganic material pollution. From these data, it can be concluded that these stations polluted by organic matter in moderates level [30,37]. It is caused by the human activity in river, including recreation, bathing and washing [38]. There also impact of agricultural activity with application of chemical fertilizer and pesticides, mining of sand and stones, and the amount of garbage that still scattered from recreational activities [36]. Based on the Principal Component Analysis (PCA) from all stations, it can be said that all Subsary stations and SP₃ downstream station has excellent quality. The SP₃ middle stream and SP₁ middle stream stations has moderate water quality. Otherwise, the SP₃ upstream, SP₁ upsteram and SP₁ downstream stations has bad quality [14].

CONCLUSION

The physical and chemical characteristic of water in all observed stations according to PP. No. 82, 2001 was classified as class II, in which the water met to the activity for fisheries, recreation, animal husbandry and irrigation. The turbidity value of all stations are in range of maximum water turbidity standard of water environment according to WHO for drinking water (<5 NTU), except for all SP₁ stations. The Prati's Index value of all station from the parameters of dissolve oxygen, BOD₅, pH, nitrate and orthophosphate shows that water quality was excellent to acceptable. Taxa richness of Macrozoobenthic in all observed station as calculated 31 individual from 7 class, including Platyhelminthes, Coleoptera, Diptera, Ephemeroptera, Odonata, Plecoptera and Trichoptera. Based on the some Macrozoobenthic biotic indices, it is clear that water in all Subsary stations and SP₃ downstream station has excellent water quality. The SP₃ middle stream and SP₁ middle stream stations has moderates water quality, while in SP₃ upstream, SP₁ upstream and SP₁ downstream was bad.

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REFERENCES

- [1] Hall and Page. 1992. The geography of tourism and recreation: environmental, place and space. Routledge. New York.
- [2] Salah, E. A. M., A. M. Turki and E. M. Othman. 2012. Assessment of water quality of Euphrates River using cluster analysis. Journal of Enviromental Protection 3, 1629-1633.
- [3] Rosenberg, D. M. and V. H. Resh. 1993. Introduction to freshwater biomonitoring and benthic macroinvertebrates. In: Rosenberg, D.M. and V. H. Resh (Eds). Freswater biomonitoring and benthic macroinvertebrates. Chapman and Hall. New York.
- [4] Sastrawijaya, A. T. 2000. Pencemaran lingkungan. Rineka cipta. Jakarta.
- [5] Hakwes, H. A. 1979. Invertebrates as indicators of river water quality. In: James, A. and L. Evison (Eds). Biological Indicator of Water Quality. Academic Press. New York.
- [6] Retnaningdyah, C. and E. Arisoelaningsih. 2014. Evaluasi kualitas ekosistem mata air di Sumber Jenon, Awan, Mlaten, Umbul dan Guno berdasarkan parameter fisiko kimia dan makroinvertebrata bentos. Research Report on Grants of Higher Education to the Community. Department of Biology. Faculty of Mathematics and Natural Sciences. University of Brawijaya. Malang.
- [7] Lestari, I. W. and Trihardiningrum. 2001. Bioassessment kualitas air Sungai Rejoso di Kecamatan Rejoso Pasuruan dengan makroinvertebrata. Bachelor Thesis. Department of Environmental Engineering. Faculty of Civil Engineering and Planning. Sepuluh Nopember Institute of Technology. Surabaya.
- [8] Quigley, M. 1977. Invertebrates of streams and rivers: a key to identification. Edward Arnold Publ. Ltd. London.
- [9] Clesceri, L. S., A. E. Greenberg and A. D. Eaton (Eds). 1999. Standard methods of examination of water and waste water, 18th Ed. American Public Health Association,

- American Water Works Association, Water Environment Federation. Washington DC.
- [10] Sen, F. and A. Aksoy. 2015. Chemical-physical quality criteria of Bulakbasi Stream in Turkey and usage of drinking, fishery and irrigation. *Journal of Chemistry*, 20-25.
- [11] Webster, R. and R.M., Lark. 2013. *Field sampling for environmental science and management*. Routledge Publisher.
- [12] Jutting, W. S. S. and Van Bethem. 1953. Critical revision of the freshwater Javaneses Gastropod. *Treubia. A Journal of Zoology, Hidrobiologi and Oceanography of Indo Australians Archipelago* 22(1), 259-477.
- [13] Edmoson, W.T. 1963. *Fresh water biology*. John Wiley and Sons, Inc. New York.
- [14] Kemple, W. G., P. M. Sadler and D. J. Strauss. 1989. A prototype constrained optimization solution to the time correlation problem. In: Agterberg, F. P. and G. F. Bonham-Carter (Eds). *Statistical applications in the earth sciences*. Geological Survey of Canada Paper 89(9), 417-425.
- [15] Effendi, H. 2003. *Telaah kualitas air*. Kanisius. Yogyakarta.
- [16] Government Regulation of Republic of Indonesia (PP RI). 2001. *Pengelolaan kualitas air dan pengendalian pencemaran air*. Ministry of Environment, Republic of Indonesia. Jakarta.
- [17] Barus, T. A. 2001. *Studi tentang ekosistem sungai dan danau*. Faculty of Mathematics and Natural Sciences. University of North Sumatra. Medan.
- [18] Firdaus, M. B., Irawan and N. Moehammadi. 2013. Keanekaragaman makroinvertebrata air pada vegetasi riparian Sungai Ordo Satu dan Sungai Ordo Dua di sistem Sungai Maron Desa Seloliman, Mojokerto. *Jurnal Ilmiah Biologi* 1, 51-60.
- [19] Chua, T. E. 2010. A Preliminary on the plankton of the Ponggol Estuary. *Hydrobio* 35(13), 24-32.
- [20] Habiebah, R. A. S. and C. Retnaningdyah. 2014. Evaluasi kualitas air akibat aktivitas manusia di mata air Sumber Awan dan salurannya, Singosari Malang. *Jurnal Biotropika* 2(1), 40-45.
- [21] Abel, P. D. 1989. *Water pollution biology*. Ellis Horwood Limited Publisher. Chichester.
- [22] World Health Organization (WHO). 2007. *Chemical Safety of Drinking-water: assessing Priorities for Risk Management*. WHO Press. Geneva, Switzerland.
- [23] van de Meutter, F. 2005. Local and regional processes in macroinvertebrate communities in shallow lakes. Katholieke Universiteit Leuven, Faculteit Wetenschappen Departement Biologie. Laboratorium voor Aquatische Ecologie. Belgium.
- [24] Philminaq. 2014. *Water quality and criteria and standarts for freshwater and marine aquaculture*. PHILMINAQ: Mitigating Impact form Aquaculture in Philipines. Philipine.
- [25] Ferreira. 2008. *Determining the influences of Land use patterns on the diatom, macroinvertebrata and riparian vegetation integrity of the lower Harts/Vaal river systems*. Dissertation. University of Johannesburg.
- [26] Ott, W. R. 1978. *Enviromental indices theory and pratice*. Annrbor Scin. Publ. Inc. Ann Arbor. Mich. Wasington, DC.
- [27] Nordhaus, I. T. Salewski and T. C. Jennerjahn. 2011. Food preferences of mangrove crabs related to leaf nitrogen compounds in the Segara Anakan Lagoon, Java, Indonesia. *Journal of Sea Research* 65(4), 414-426.
- [28] Hsieh, H. L., C. P. Chen, Y. G. Chen and H. H. Yang. 2002. Diversity of benthic organic matter flows through polychaetes and crabs in a mangrove estuary: $\delta^{13}C$ and $\delta^{34}S$ signals. *Marine Ecology Progress Series* 227, 145-155.
- [29] Bouillon, S., T. Moens, I. Overmeer, N. Koedam and F. Dehairs. 2004. Resource utilization patterns of epifauna from mangrove forests with contrasting inputs of local versus imported organic matter. *Marine Ecology Progress Series* 278, 77-88.
- [30] Mandaville, S. M. 2002. Benthic Macroinvertebrata in freshwater-taxa tolerance values, metric and protocols. *Soil and Water Conservation Society of Metro*. Halifax.
- [31] Miserendino, M. L. and L. A. Pizzolon. 2001. Abundance and altitudinal distribution of Ephemeroptera in an Andean-Patagonean River system (Argentina). In: Dominguez, E. (Ed). *Trends in research in Ephemeroptera and Plecoptera*. Kluwer Academic. The Netherlands. 135-142.
- [32] Rini, D. A. 2007. Mengenal makroinvertebrata bentos. *Warta Konservasi Lahan Basah*. Available at: <http://papua.web.org/dlib/jr/wklb/edisiokt2007.pdf>.
- [33] Lee, C. D., S. B. Wang and C. L. Kuo. 1978. Benthic macroinvertebrate and fish as

- biological indicator of water quality: with reference on water pollution control in developing countries. *Bulletin of C. Sciences Bangkok*.
- [34] Krebs, C. J. 1989. *Experimental analysis of distribution and abundance*, 3rd Ed. Harper and Row Publisher. New York.
- [35] El Sherief, M. Z., A. M. Gharib, A. J. Abdel-Halim and A. A. Radwan. 2011. Phytoplankton and environmental variables as a water quality indicator for the beaches at Matrouh, Sout- Eastern, Mediterranean Sea, Egypt: assessment. *Oceanologia* 53(7), 98-109.
- [36] Meybeck, M. 2003. Global analysis of river systems: from Earth system controls to Anthropocene syndromes. *Philosophical Transactions of the Royal Society of London B1379*, 1-21.
- [37] Armitage, P. D., D. Moss, J. F. Wright and M. T. Furse. 1983. The performance of a new biological water quality score system based on macroinvertebrates over a wide range of unpolluted running-water sites. *Water Research* 17, 333-347.
- [38] Carpenter, R., N. F. Caraco, D. L. Corre, R. W. Howarth, A. N. Sharpley and V. H. Smith. 1998. Non point pollution of surface water with phosphorus and nitrogen. *Ecologic Application* 8(3), 555-568.
- [39] Wallace, J. B. and J. R. Webster. 1996. The role of macroinvertebrates in stream ecosystem function. *Annual Review of Entomology* 41, 115-139.
- [40] Badawy, R. M., E. I. Hoseny and M. Talal. 2013. Biodiversity and seasonal fluctuation of aquatic and semiaquatic insects in Rashid Stream, Kafr El Zayat. *Egyptian Academic Journal of Biological Sciences* 6(1), 47-66.

Ecotourism Development Strategy of Bukit Jaddih Karst, Madura

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Abstract

Bukit Jaddih karst in Bangkalan, Madura, is an ex-limestone mining location managed partially by individuals or community groups as tourism area. This study aims to develop sustainable strategies for Bukit Jaddih karst resources and ecotourism. Data were obtained from questionnaires given to 30 respondents consisting of visitors, miners, traders, society, and policymaker then being analyzed for the strategy on the development of tourism object. SWOT strategy was used to determine every aspect of tourism development (weight 0.00 to 1.00). Score are given in a rating where the rating indicates the level of importance. The IFAS analysis shows Bukit Jaddih karst has some dominant internal strengths, i.e. uniqueness, safety, cleanliness, access to food-stalls, and cellular networks covering tourist areas. However, tourist services in Bukit Jaddih karst are not good enough and indicated as dominant weakness. EFAS shows that Bukit Jaddih karst can provide employment opportunities for the surrounding community. The strategy of the Matrix analysis supports an aggressive growth policy (Growth Oriented Strategy), which is using the Strength Opportunities (SO) strategy and is applied based on the utilization of the opportunities of Bukit Jaddih karst ecotourism. The strategies to be developed are 1). Promotion through prints, TV, radio and social media; 2). Developing diversified tourism attractions; 3). Mapping the tourism potential of Bangkalan Regency; 4). Establishment of Tourism Awareness Group (*Kelompok Sadar Wisata, Pokdarwis*); 5). Training for local community as guide; 6). The establishment of Surabaya-Madura tourism package; 7). Establishment of regulations on the cleanliness, security, and comfort.

Keywords: Bukit Jaddih karst, EFAS, IFAS, strategy, tourism development.

INTRODUCTION*

Karst is topographically formed from a mixture of dissolved rocks, such as lime, dolomite, and gypsum, characterized by an underground river system of water in the soil with holes and caves [1,2]. Karst is very important as a source of clean water in the area, especially on the dry season [3]. Karst and cave are very valuable natural resources, becoming the habitat of a wide variety of ecological niche. In addition, many types of plants and animals, including endemic species, are found in the karst area. Karst also becomes a unique microbial habitat [4]. However, karst areas are threatened by human activities, mainly by farming and agricultural practices, fire, mining, urbanization, housing and infrastructure development, drilling and piping, material transport, and vegetation removal [5,6].

The management of Karst as a tourism area has long been started in several countries. The Anina Karst complex, which is a former mine in Romania, has turned into an exploratory tour

that supports the socio-economic progress of the surrounding community [7]. In addition, the Kabar area of Puerto Rico is being developed into an ecotourism that promotes social, economic, and educational growth on the importance of karst in human life [8].

Bukit Jaddih karst in Bangkalan, Madura, is a former limestone area included in the Jaddih Karst area. Bukit Jaddih is one of the ancient karst formation in Indonesia, apart from other Karst Areas, such as Mount Lawu which consists of Gunung Kidul (Jogja), Wonogiri, Pacitan [9,10], and Maros, South Sulawesi [11]. Unfortunately, with a variety of ancient geomorphic shapes, Bukit Jaddih karst is minimally protected as a nature reserve area. There is no protection against mining activities, and threatens the role of Bukit Jaddih karst as a conservation support of the area and the source of clean water.

Tourism is the best option for avoiding conflicts of interest, preserving the natural environment, and at the same time enhancing the social and economic values of society [12,13,14]. Therefore, recent mining activities have shifted to tourism. However, this new activity faces many challenges, such as the lack of structured management, the impact of mass tourism, and human activity on the sustainability of Karst's tourism and environment. This study

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aims to develop a sustainable strategy for Bukit Jaddih karst resources and ecotourism.

RESEARCH METHOD

Study Site

The research area is located in Socah Sub-district, Bangkalan Regency, Madura, East Java. This karst area is a former limestone mining area that has been transformed into various tourist objects since 2014, such as Gua Pote spring, bathing place, Biru Lake, Jaddih Cave, and Jaddih hill (Fig. 1). In addition, there are a lot of resorts and shops opening in small groups of people.

Data Collection

Data were obtained from questionnaires given to 30 respondents consisting of visitors, miners, traders, society, and policy maker. The study was conducted on October 2017. Observations are also based on visible physical conditions and existing activities. The questionnaire is used as a representation of perceptions on Bukit Jaddih karst tourism, i.e. 1) strength (uniqueness, security, cleanliness, road conditions, distance, accommodation access, and cellular network), 2) weakness (noise, service, lack of accommodation and information), 3) Opportunities (potential employment, national tourism development, the rare of karst

destination, Bukit Jaddih karst strategic positions, interesting sights on access roads), 4) threats (regulation, partial management, lack of investor, lack of tourism impact analysis, and unintegrated tariff).

Analysis

The results of the observations were analyzed descriptively. Then being analyzed for the strategy on the development of tourism object. Strategy development using SWOT analysis [12]. Some aspects of SWOT include aspects of strength (S), weakness (W), opportunity (O) and threat (T), where all four are related to each other. Through these links, there will be some basic development strategies or concepts that can be used in ecotourism development of Bukit Jaddih karst, Bangkalan Madura both physical and non-physical. The determination of the basic concept of development is based on the SWOT analysis by assessing (weighting) using IFAS analysis (Internal Factor Analysis Summary)-EFAS (External Factor Analysis Summary) [12]. IFAS-EFAS was used for determining the regional development strategy, and then the assessment (weighting) which is presented in the form of quadrant will determine the next development strategy.



Figure 1. Bukit Jaddih karst: A. Bathing Place, B. Gua Pote Spring, C. Jaddih Hill, D. Jaddih Cave
Source: GIS Analysis 2018

Assessment is done on every aspect of the SWOT by assigning a weight 0.00 to 1.00, which if the respective factors (internal/external) aspects is added, will get the weights 1. After weighting, score are given in a rating where the rating indicates the level of importance (1=unimportant; 2=rather important; 3=important; 4=very important) of each aspect [12]. Then, the weighted value is multiplied by a determined rating. The sum of each factor (internal/external) is then being summed to create the SWOT quadrant in determining the development strategy.

RESULT AND DISCUSSION

Bukit Jaddih karst provides some observational tourism activities. The mining damage on Bukit Jaddih karst has been covered by beautiful, artificial and natural forms of fragments. The ex-sawmills form flat surface cliff, while digging process leave some artificial caves that are used for stalls (Fig.2).

Visitors do selfie to take their picture with a unique karst background. The color of white karst seemed to glow with the sunlight. Each

spot has a creative name board and colorful background.

There are some rafts for exploring Gua Pote spring. Visitors can enjoy the view from the raft by paying IDR 5000, - (about USD 0.36) for each trip. It takes about 2 hours to explore all of Bukit Jaddih karst area.

The IFAS analysis shows Bukit Jaddih karst has some dominant weight (0.09) which consisted of uniqueness, safety, cleanliness, food access to food-stalls, and cellular networks covering tourism areas. However, tourist services in Bukit Jaddih karst is not good enough. This is illustrated by its weight dominance of 0.10 (Table 1). Less integrated service in Bukit Jaddih karst is the main cause of this fact.

The result of EFAS analysis shows that Bukit Jaddih karst can provide employment opportunities for the surrounding community, which is indicated by the factor weights that dominate among other factors (0.12). The public revealed that the opening of Bukit Jaddih karst as tourism area promised better economic income. However, the absence of regulations supporting tourism activities poses the highest threat in Bukit Jaddih karst (0.11) as mentioned in Table 2.



Figure 2. Bukit Jaddih karst and human activities. A. Tourism rafts at Gua Pote spring, B. Karst cliff as tourist photos background, C. Trucks move limestone as cement raw material, D. Miners sawing limestone

Table 1. Result of Assessment and Weighting of IFAS of Bukit Jaddih karst

Internal Factor	Weight	Rating	Weight x Rating
Strength :			
The uniqueness of Bukit Jaddih karst	0.09	3.29	0.29
The security perceived by visitors during the ecotourism Bukit Jaddih karst	0.09	3.39	0.30
Cleanliness of ecotourism area of Bukit Jaddih karst	0.09	3.00	0.28
Type of road to ecotourism of Bukit Jaddih karst	0.08	3.43	0.26
Distance from Suramadu Bridge to Ecotourism of Bukit Jaddih karst	0.07	2.57	0.17
Access to food / drink stalls	0.09	3.29	0.30
Cellular network conditions	0.09	2.71	0.24
Total	0.60		1.84
Weakness :			
Free from noise (sound mining activities still disturbing	0.09	3.57	0.33
Service at Bukit Jaddih karst felt not good	0.10	3.86	0.37
Travel time is not commensurate with mileage, because the road conditions	0.08	3.00	0.23
The absence of lodging around the ecotourism site Bukit Jaddih karst	0.08	2.43	0.19
Lack of information about lodging	0.06	2.43	0.15
Total	0.40		1.27
Total IFAS		1	3.11

Table 2. Result of Assessment and Weighting of EFAS of Bukit Jaddih karst

External factors	Weight	Rating	Weight x Rating
Opportunity :			
Create jobs and provide direct benefits to the community	0.12	4.00	0.47
The development of tourism that can continue to increase	0.10	3.57	0.34
Karst ecotourism is still very rare in Indonesia	0.10	3.29	0.33
Position of the screen is very strategic with other attractions to visit	0.09	2.71	0.24
Along the way to ecotourism Bukit Jaddih karst area many interesting sights	0.10	3.29	0.33
Total Opportunity	0.50		1.71
Threat			
The absence of regulations that support the Bukit Jaddih karst ecotourism	0.11	3.43	0.37
Bukit Jaddih karst Ecotourism Management is still managed partially (there is no institution yet)	0.10	3.29	0.34
Lack of investors	0.08	2.29	0.18
Lack of attention to the environmental impact of the attraction of existing development projects	0.10	3.57	0.37
Unintegrated entry cost at one door	0.10	3.43	0.34
Total Threat	0.50		1.62
Total EFAS		1	3.33

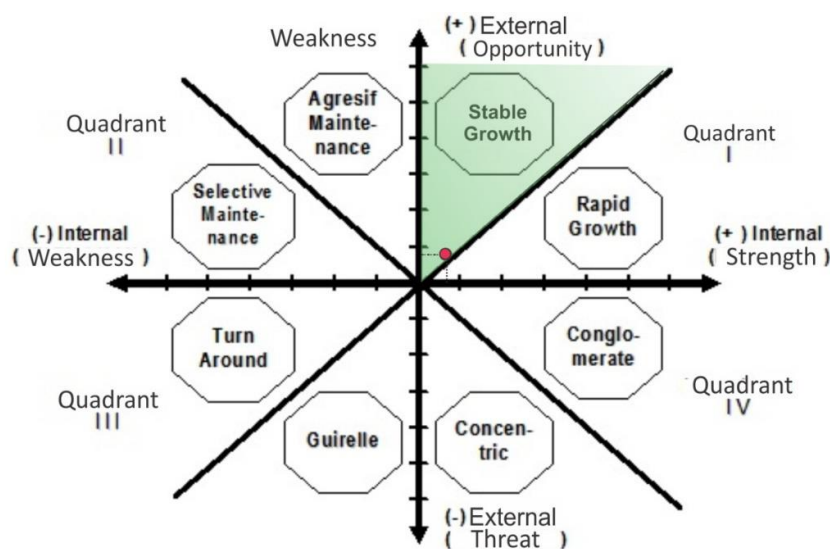


Figure 3. Bukit Jaddih karst development position on IFAS – EFAS Analysis Strategy Quadrant. The development position of Bukit Jaddih karst indicated by red point and green highlight.

Based on the calculations with IFAS and EFAS, we can determine the value of X and Y. X is the value of the difference between Strength (1.84) and Weakness (1.27), i.e. 0.57. Y represents the difference between Opportunity (1.71) and Threat (1.62), i.e. 0.09. Then, we determined the position of Bukit Jaddih karst's tourism in the IFAS-EFAS strategy quadrant (Fig.3).

Based on the IFAS-EFAS strategy quadrant, the development of Bukit Jaddih karst is located in quadrant I of space B. Thus the strategy used in ecotourism development is the stable growth strategy; the development strategy of the object, which is in a huge opportunity situation to be developed according to the strengths.

The uniqueness of Bukit Jaddih karst is perceived by respondents as the main attraction that bring tourists to visit. Natural charms such as the unique landscape on Bukit Jaddih karst, become the driving motivation for nature-based tourism [13,14]. In addition, security, cleanliness, the existence of food and beverage shops in the tourism area into internal strength owned by Bukit Jaddih karst. These three factors arise due to the desire and participation of the community in managing the Bukit Jaddih karst tourism sector partially. Therefore, security, cleanliness, and access to the consumption of tourists need to be guaranteed. Safety and hygiene are supporting the establishment of sustainable tourism [15,16]. Its location where is not too far from other public center indicated by existence of cellular network which can be easily accessed by tourists at Bukit Jaddih karst. Several tourism areas along with various information and promotion facilities that are managed organically or privately, require fast and growing mobile network access [16,17].

The existence of the desire groups and individuals who provide a tourism service, tend to impact on poor competition and weaken the object of tourism [14]. One of the impact is the transition or multi-profession that they run, ranging from parking service providers, area service providers, sales of local merchandise, food and beverages that are managed individually or in small groups. The opening of tourism sites has always been a source of business and trade development potential. This activity is a response to the opportunities that appeared [18].

Regulation becomes the basis of a tourism site to continue to grow and is a very big support from the government. Regulation can be a limitation of tourism development to remain in the principles of sustainability, avoid unhealthy

competition, become a means of educating people and tourists, and become a pathway for sustainable tourism development [19].

The strategy used is to minimize internal problems to bring up some of the great opportunities [20]. The strategy of the Matrix analysis supports an aggressive growth policy (Growth Oriented Strategy), which is using the Strength Opportunities (SO) strategy and is applied based on the utilization of the opportunities of Bukit Jaddih karst ecotourism. The compiled strategies are a representation of the wish that Bukit Jaddih karst be a form of sustainable ecotourism supported by community empowerment, environmental sustainability, and economic welfare.

Based on quadrant analysis, the development strategy can be arranged in a SWOT (Strength, Weakness, Opportunities and Threats) matrix. The strategies developed are: (1) Promotion through prints, TV, radio and social media to expand market share and increase the number of visits, (2) Developing diversified tourism attraction, (3) Mapping of tourism potential in Bangkalan Regency for the development of other types of tourism, (4) Establishment of Tourism Awareness Group (Pokdarwis) to assist the management of trade activity in Bukit Jaddih karst tourism area, (5) Training for local community as guide, so it is expected to increase income, (6) The establishment of Surabaya-Madura tourism package, covering several Bangkalan tourism destinations that are professionally packed, (7) Establishment of regulations that regulate the cleanliness, security, and comfort of tourists.

Information media became one of the main supporting pillars of the establishment of sustainable tourism. Advances in information, such as the internet and mobile phone networks can make it easier for travelers to visit and receive accommodation services directly [17]. Diversification of attraction allows visitors to be more satisfied and experience a unique, educated, and well organized tourism atmosphere [14]. In addition, Bukit Jaddih karst should be supported by the strengthening of human resources, where in a sustainable ecotourism, local communities are expected to be heavily involved. External factor support strategy, in this case local government, is expected to be regulation, training, and mentoring. The government's attention will accelerate ecotourism development and maximize the role of local communities [19,21].

CONCLUSION

Based on the IFAS-EFAS strategy quadrant, the development of Bukit Jaddih karst is located in quadrant I of space B, so that the strategy used in ecotourism development is the stable growth strategy, or the development strategy of the object which is in a very big opportunity situation to be developed according to the strengths. The strategies developed are: (1) Promotion through prints, TV, radio and social media to expand market share and increase the number of visits, (2) Developing diversified tourist attraction, (3) Mapping of tourism potential of Bangkalan Regency for the development of other types of tourism, (4) Establishment of Tourism Awareness Group (Pokdarwis) to assist the management of trade activity in Bukit Jaddih karst tourism area, (5) Training for local community as guide, so it is expected to increase income, (6) Establishment of Surabaya-Madura tourism package, covering several Bangkalan tourism destinations that are professionally packed, (7) Establishment of regulations that regulate the cleanliness, security, and comfort of tourists.

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REFERENCES

- [1] Fort, D.C. and P.W. Williams. 1999. Karst geomorphology and hydrology. Chapman and Hall. London.
- [2] Galdenzi, S., M. Cocchioni, L. Morichetti, V. Amici and S. Scuri. 2008. Sulfidic ground water chemistry in the Frasassi Cave, Italy. *Journal of Cave and Karst Studies* 70, 94-107.
- [3] Fiorillo, F., P. Revellino and G. Ventafriida. 2012. Karst aquifer draining during dry periods. *Journal of Cave and Karst Studies* 74, 148-156.
- [4] Pipan, T. and D.C. Culver. 2013. Forty years of epikarst: what biology have we learned? *International Journal of Speleology* 42, 215-223.
- [5] Langer, W.H. 2001. Potential environmental impacts of quarrying stone in karst – a literature review. Open-file report OF-01-0484. US Geological Survey.
- [6] diMaggio, C., G. Madonia, M. Parise and M. Vattano. 2012. Karst of Sicily and its conservation. *Journal of Cave and Karst Studies* 74, 157-172.
- [7] Artugyan, L. 2014. Geomorphosites as a valuable resource for tourism development in a deprived area: the case study of Anina Karsatic Region (Banat Mountains), Romania. *Analele Universităţii din Oradea, Seria Geografie* 2, 89-100.
- [8] Hall, A. and M. Day. 2014. Ecotourism in the state forest karst of Puerto Rico. *Journal of cave and Karst studies* 76, 30-41.
- [9] Retnowati, A. 2014. Culture and risk based water and land management in karst area: An understanding of local knowledge in Gunungkidul, Java, Indonesia. Master Thesis. Program Study of Geography, Mathematic and Computer Science Faculty, University of Giessen. Hesse, Germany.
- [10] Kusumayudha, S. B., J. Setiawan, A. N. Ciptahening and P. D. Septiana. 2015. Geomorphologic model of Gunungsewu karst, Gunung Kidul Regency, Yogyakarta Special Territory, Indonesia: The role of lithologic variation and geologic structure. *Journal of Geological Resource and Engineering* 1, 1-7.
- [11] Arsyad, M., H. Pawitan, P. Sidauruk and E. I. K. Sari. 2014. Analisis ketersediaan air sungai bawah tanah dan pemanfaatan berkelanjutan di kawasan Karst Maros Sulawesi Selatan. *Jurnal Manusia dan Lingkungan* 21(1), 8-14.
- [12] Kent, M. 2003. Ecotourism, environmental preservation and conflicts over natural resources. *Horizontes Antropológicos* 9(20), 185-203.
- [13] Mensah, I. and A. Ernest. 2013. Community participation in ecotourism: the case of Bobiri Forest Reserve and butterfly sanctuary in Ashanti Region of Ghana. *American Journal of Tourism Management* 2(1A), 34-42.
- [14] Blaj, R. 2014. Ecotourism and nature tourism – components of a sustainable management of forests. *Journal of Horticulture, Forestry, and Biotechnology* 18(4), 51-54.
- [15] Ommani, A. R. 2011. Strengths, weaknesses, opportunities, and threats (SWOT) analysis for farming system businesses management: case of wheat farmers of Shadervan District, Shoushtar Township, Iran. *African Journal of Business Management* 5(22), 9448-9454.
- [16] Faida, L. R. W. 2014. Primeval forest in the period of human cultural history on Gunungsewu Karst Indonesia. *Journal of*

- Procedia Environmental Sciences 20, 795-802.
- [17] Jensen, O., Y. Li and M. Uysal. 2017. Visitors' satisfaction at managed tourist attractions in Northern Norway: Do on-site factors matter? *Journal of Tourism Management* 63, 277-286.
- [18] Amedie, F. A. 2013. Impacts of climate change on plant growth, ecosystem services, biodiversity, and potential adaptation measures. Master Thesis. Program Study of Biological and Environmental Science, University of Gothenburg, Sweden.
- [19] Parmawati, R., A. S. Leksono, B. Yanuwadi and A.S. Kurnianto. 2017. Exploration of marine tourism in Watulimo, Trenggalek Regency: challenges, potentials, and development strategies. *Journal of Indonesia Tourism and Development Studies* 5(3), 175-184.
- [20] Stange, J., Brown, D. and S. International. 2007. *Tourism destination management: achieving sustainable and competitive results: Online tool kit and resource series*, USAID. Available at: www.usaid.gov.
- [21] Kiper, T., G. Ozdemir and C. Sağlam. 2011. Environmental, socio-cultural and economical effects of ecotourism perceived by the local people in the northwestern Turkey: Kiyiköy case. *Scientific research and Essays* 6, 4009-4020.

The Ethnobotany of Abui's Homegardens and its Potentiality to Support Rural Tourism Development in Alor, Indonesia

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Abstract

The aim of the research is to explore the value of homegardens at Abui community in Takpala Village, Alor Island, as a basis of rural tourism development. The value of home gardens was assessed in the perspective of local people's culture. Therefore, ethnobotanical assessment with Index of Cultural Significance (ICS) was implemented. Data was collected through field observation and interviews to local community. Survey was done in 15 houses in Takpala settlements by identifying plant species in homegardens area. Interviews were performed to generate information regarding flora benefits in the daily life of local people in Takpala. Result of the study shows that homegarden has an important role among Abui community, especially in cultivating numerous plant species for daily life. Homegarden has its potentiality to be introduced as part of the tourism development attraction in Takpala Village.

Keywords: conservation, economic plant, rural tourism, Timor homegarden.

INTRODUCTION

Indonesia has abundance natural and cultural resources, in which many of these resources have been promoted and used in tourism industry. Indonesia is also home to numerous spectacular landscapes which are unique and many of them has special relationship with its local culture [1]. According to tourism statistical data released by Ministry of Tourism in 2017, number of international tourism increase significantly. In 2014, number of tourist was recorded 9,435,411 and increase to 10,406,759 in 2015. In 2016 international tourist arrival was recorded 12,023,971 [2]. International tourist arrivals and tourism activity contribute to the national and regional economic earning. Scholars point out that tourism has significant role in development and therefore it is reasonable to support more tourism sector development. It is especially important to increase the local community's economic development.

Alor Island in East Nusa Tenggara Province is naturally and culturally rich in term of tourism resources. In the perspectives of tourism development, Alor close to the issues of less developed regions, indicated by lack of tourism infrastructure and poor of human resources in tourism. In the situation where traditional aspect of life is dominant, Alor represent a unique tourism destination among western people. Alor

is home to indigenous community called Abui, in which many of them live in rural areas in Alor. Abui community is one of the oldest tribes in Alor Island that maintain the authenticity of culture than other tribes on the island. The living place of Abui community that is often visited by tourists is *Kampung Takpala*. Takpala is a traditional village with its unique landscape and its citizens uphold the customs and culture. There are relics of ancestors, rows of traditional houses and homegarden as a unity of tourist attractions.

Local people in rural area in Alor live in traditional ways, create a balance life between human and nature in harmony. The sustainable living system has been promoted and implemented as a part of the living system. Knowledge to manage space has produce numerous types of ecosystem that are important to support living system in remotes area. Homegardens is one of the important form of land uses in Abui community, which its role has been considered important. Homegarden arrangement is the representative of local knowledge to enhance the living sustainability among local people, especially in term of the sustainability of food supply [3,4].

Homegardens were widely explored to identify its benefits for food security, public health and biodiversity conservation. The high biodiversity of homegardens provides numerous resources for consumable plant, namely plant for human food, medicinal and cultural usage [5]. In tropical countries, homegarden often shows complex vertical and horizontal structure. In many case, the homegardens related with local

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culture [6]. Homegardens management and people perception to the plants in homegardens system produces unique landscapes [7]. Many of them are unique and has potentiality to be integrated in the tourism development.

The homegarden in Takpala community has its potentiality as tourism resources. In some countries, the homegardens has significant contribution in visual aspect, especially in creating beautiful landscape. The development and integration of homegarden in Takpala especially important to support the development of settlement in Takpala as tourism destination. The Takpala settlementst contain 15 traditional houses with its homegardens as an integral part of the traditional ecosystem. The aims of the research is to explore the value of homegardens at Abui community for potential resources of rural tourism development.

MATERIALS AND METHODS

Study Area

Field research was done in the Abui community, especially in local settlement in Takpala Traditional Village. Administratively, this area belongs to Lembur Barat Village, Alor Tengah Utara Sub-regency, Alor Regency in East Nusa Tenggara Province. The local settlement located at the slope of Mt. Abui at elevation 131 m asl, surrounded by forest and plantation (Fig. 1). The local people of *Kampung Takpala* belongs to the Abui tribal community and considered as one of the old tribal community in Alor Island. The majority of local people was farmers that depend on the forest resources, plantation and hunting.

Data Collection

Field survey was conducted at 15 units of house and its homergadens. In each visited garden, flora identification was implemented by direct observation and identification. The principal characteristics of plant identification is based on morphological characters. Plant specimen collection was done only when the plant is unidentified by direct observation.

The sample was collected as herbarium material for further identification in Laboratory of Plant Taxonomy in University of Brawijaya (Malang, East Java) and Purwodadi Botanical Garden in East Java. In each garden, an interviews was conducted to the owners to describe the types of uses of each plant in their homegardens.

Data Analysis

The use of numerous plant species in homegardens environment was evaluated using basic formula of Index of Cultural Significance (ICS) following the formula [8,9].

$$ICS = \sum_{i=1}^n (q \times i \times e)_{ni}$$

Since some plant has many function, the formula was modified into:

$$ICS = \sum_{i=1}^n (q_1 x i_1 x e_1)_{n1} + (q_2 x i_2 x e_2)_{ni} \dots + (q_n x i_n x e_n)_{ni}$$

Description:

ICS: total use value of particular species from 1 to n representing the last described use.

Q: Quality value, was calculated following the important value of plant in daily life of local community. It is assessed following scores: 5 (main staple food), 4 (secondary food or primary materials), 3 (other foods or secondary materials or medicinal plant), 2 (plant for ritual, mitology and other usage), 1 (use/mere recognition).

i: Intensity value, shows the intensity of plant, with: 5 (very high intensity), 4 (high intensity), 3 (moderate intensity), 2 (low intensity), 1 (rare or very low in intensity of use).

e: Exclusivity value, conditions: 2 (the most favored plants that become the main preferences and could not be replaced); 1 (the favored plants but could be replaced by other species of plant) and 0.5 (the beneficial plants that become the secondary preferences).

RESULTS And DISCUSSION

Homegardens as Component of Settlement

Homegardens is a principal component of traditional landscape in Takpala. The roles of homegardens are numerous, including sites for cultivating some plant species which are consumed in daily lives and sites to grow medicinal plants species. Physically, homegardens located at slope land, ranges from 5-40° lead local people adaptation to manage land by following land contour and establishing terrace. Terrace structure was strengthened by stone and plant (Fig. 2). Terrace was design to provide space to cultivate numerous plants and reduce soil erosion. Therefore, terrace is the useful methods in land conservation and protection against rainfall water flows [10].

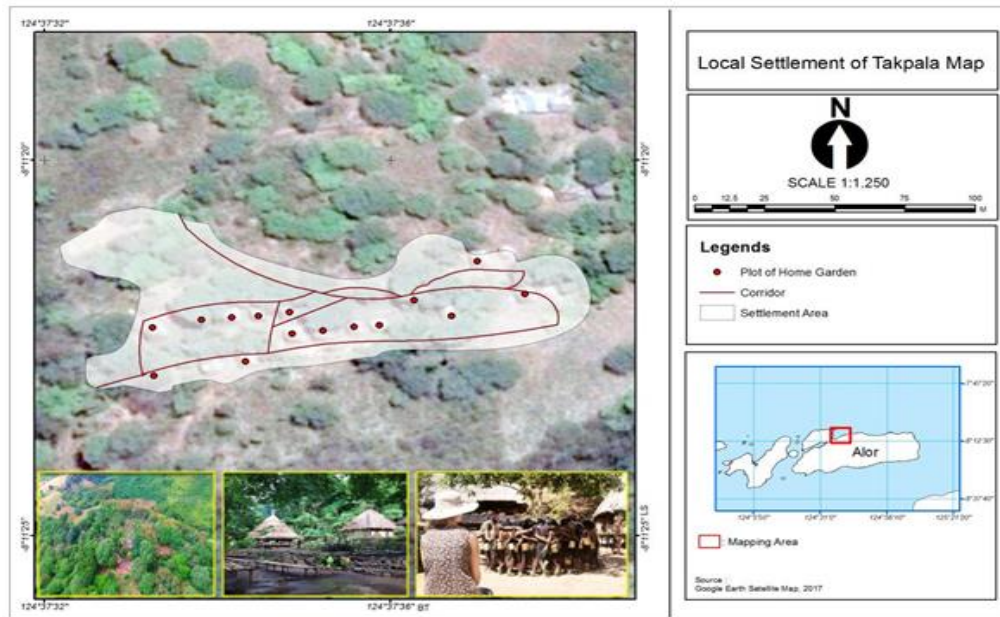


Figure 1. Map and Situation of Takpala Local Settlement in Alor Island, East Nusa Tenggara



Figure 2. Terrace Structure in Homegardens

The homegardens has numerous sites. Many of them was set up without border. The land of house and homergardens ownership often has stone and vegetation border. The length of homegarden from east to west was about 2-4 meter and the length of gardens from north to south has more length. In some homegardens, there are public toilet and animal's cage in the backyards area. Homegarden with large area often has traditional rest area build from bamboo (locally called *liktaha*).

Takpala settlement area located at the semiarid regions, with length of 7-8 months dry season in a year. Length of rainy season was limited. This situation influence the homegarden management, in which intensive garden management only optimum in rainy seasons. It is often started at October. The management of homegardens was practiced following traditional mechanism. There are no modern tools and equipment was practiced, including chemical

pesticides and fertilizer application. Weeding was done in homegarden regularly in free time after farming activity. Crops cultivation was done in traditional manner. Homegarden is miniature of farmlands. Many plant species cultivated, including staple food, medicinal plant and ornamental plant.

The Value of Species

The value of species as calculated using ICS was shown in Table 3. *Areca catechu* (Arecaceae) has the highest ICS value (ICS = 112). *Areca catechu*, is locally called *pinang*, in the perspective of Abui community is important plant. It is not staple food, but it is culturally important. There are tradition among local people (Abui community) to consume *pinang* (areca nut). Abui traditionally called it as *fu takey* or *mamasiri*, which was done in daily life without limitation time. *Pinang* consumption is basically local tradition and *Adat* symbol. It is not only practiced in Abui community in Alor, but it is widely practiced among local community in Nusa Tenggara Islands and eastern Indonesia. Besides palm fruit, areca palm has numerous benefits among local people in Takpala. The bark of tree was proceed as a water canal and civil construction material. Bark also used as fuel wood. The midrib of *areca catechu* was used as food package and other package purposes, and handicraft. *Areca catechu* was introduced in homegarden especially to countermeasure land erosion.

The second species with highest ICS was *Cocos nucifera* L. (coconut), with ICS value 109. It is widely recognized that coconut is important plant for numerous purposes. Coconut has economic value and becomes the important crops plant in many area in developing countries. [11,12]. *Cocos nucifera* L. has high cultural and social value among local community in Abui. This plant was used for numerous purposes to support daily life activity of local community of Abui. The water of fruit and young coconut often consumed as beverages. The coconut milk was used as medicinal material, cooking and components of washing hair in traditional healing treatment. The steam was used for numerous purposes, especially for civil materials. Many parts of coconut are also widely used as fuel wood.

Zea mays (Poaceae) is the third important species with high value of ICS. Corn is the main food for local people in Alor, including community in Takpala. Corn is widely cultivated in homegardens. Corn is a main sources of carbohydrates. In many events, corn was cooked as food in traditional ceremony and religious activity. The midrib of corn was used as cattle fodder.

Rice, *Oryza sativa* (Poaceae) has been recognized as one of the culturally important species among Abui community. Some households in Takpala cultivate rice in homegardens in limited amount. Interestingly, some informant in this study state that people cultivate rice in small population in homegardens just to meet their hobby, increase the beauty of home gardens, and as miniature of paddy upland field. Widely, rice is important carbohydrate sources in Indonesia, but in semiarid and arid regions, rice often replace by corns as a staple food. Traditionally, rice cooked and served using

traditional dish created from leaf of *lontar pal* (*Borassus flabellifer*). It is especially found in cultural events and religious ceremony in Abui community in Takpala.

Coffee (*Coffea* sp) was also identified as culturally important species among Abui community. Coffee is the common drink in Indonesia, and it is widely cultivated in Indonesia [13]. Besides consumed in daily life, coffee was also involved in many cultural and social activity. Among Abui community in Takpala, coffee is important beverages and the tradition to drink coffee is culturally transmitted from generation to generation through cultural and social activity. In Takpala, coffee is also use as medicinal plant. The wood of coffee is also used as materials for handicraft and fuel wood.

Species with high ICS shows the important of species in the daily life of community in Takpala. Depending on the situation and condition, the value of ICS and species rank can be changes. This phenomena is basically influenced by changes of community perception and appreciation to species, especially in species usages.

Implication for Rural Tourism Development in Takpala Traditional Village

SWOT analysis confirm that there are numerous internal and external aspect for the design establishment of homegarden conservation (Table 2). In the perspectives of tourism development, Homegarden is basically can be introduced as part of the tourism attraction development. Homegardens' of Abui community is crucial ecosystem component in human settlements in Takpala. Homegardens management was done in traditional approach, and overall, it is represent the cultural value of local people in Takpala.

Table 1. Plant Species with Highest ICS Value

No	Local name (Indonesia)	Scientific name	Family	ICS
1	Pinang	<i>Areca catechu</i>	Arecaceae	112
2	Kelapa	<i>Cocos nucifera</i> L.	Arecaceae	109
3	Jagung	<i>Zea mays</i>	Poaceae	102
4	Padi	<i>Oryza sativa</i> L.	Poaceae	100
5	Kopi	<i>Coffea</i> sp.	Rubiaceae	91
6	Pepaya	<i>Carica papaya</i> L.	Caricaceae	88
7	Bambu	<i>Bambusa</i> sp	Poaceae	84
8	Pisang kepok	<i>Musa paradisiaca</i> L.	Musaceae	78
9	Sirih	<i>Piper betle</i> L.	Piperaceae	78
10	Kesambi	<i>Schleichera oleosa</i>	Sapindaceae	75
11	Bambulicin	<i>Bambusa vulgaris</i>	Poaceae	72
12	Kunyit	<i>Curcuma domestica</i> L.	Zingiberaceae	66
13	Manggakelapa	<i>Mangifera indica</i>	Anacardiaceae	66
14	Nangka	<i>Artocarpus heterophyllus</i>	Moraceae	64
15	Lamtoro	<i>Leucaena leucocephala</i> L.	Mimosaceae	62

Table 2. SWOT Analysis of Homegarden Conservation as a Basic for Tourism Development in Takpala

Factors	Strengths (S)	Weaknesses (W)
Internal	1. Attractive and beauty landscape with its component (i.e. <i>mesbah</i> , <i>mesang</i> , and traditional house, historical resources)	1. Conflict in land ownership.
	2. Local knowledge in homegarden management.	2. Poor information on history and tourism attraction
	3. Homegarden contains 133 species and 55 family of plant species	3. Poor of local appreciation in historical building preservation, environment cleanliness
	4. Art and cultural assets which area attractive to tourist	4. Potential conflict among local people caused by high competition in tourism industry.
	5. Local community has local knowledge to use numerous plant species for numerous purposes.	5. Lack of ornamental plant and indigenous species in homegarden.
	6. Geographically, Takpala is accessible, close to airport, road and close to other tourism attraction	6. Poor of tourism infrastructure and tourism information
	7. Fresh water is available to support local community and tourist.	7. Water debit decrease in dry season.
External		
Opportunities (O)	Strategy S/O	Strategy W/O
1. Global tourism growth.	1. Designing Traditional Village of Takpala as a sites for cultural and heritage tourism.	1. Reconciling all of the community member and create commitment for development.
2. Global conservation growth.	2. Promoting Traditional Village of Takpala as an ideal sites for biodiversity research, and edu-	2. Inviting researcher to explore the history of Takpala.
3. Global attention to the local culture and indigenous landscape conservation.	3. Promoting vegetables, fruit and many crop products and enhancing the local capacity to produce numerous food based on local resources.	3. Collaboration with government and all stakeholders to promote environmental health, sanitation, etc.
4. Indonesian government policy to increase development in remotes area.	4. Enhancing community involvement in the implementation of rural tourism in Takpala.	4. Introducing and increasing number of indigenous plant species in homegarden.
	5. Managing plant species, including medicinal plant and crops as an interesting attraction for tourism development.	
Threats/T	Strategy S/T	Strategy W/T
1. Lack of government involvement in tourism planning and management in Takpala.	1. Developing communication among local movement-local community and private sector to support tourism development.	1. Promoting collaboration between stakeholders and local community
2. Rarity of building material to enhance the sustainability of local buildings.	2. Strengthening control mechanism on the uses of natural resources, especially forest resources.	2. Strengthening the networking in the traditional village of Takpala.
3. Less availability of seeds of numerous native and indigenous plant tree species.	3. Strengthening local wisdom to manage homegardens.	
4. Rapid modernization changes local cultural organization and local value.	4. Promoting local culture of Abui in many activity, especially in gardening and farming.	

Managing homegarden properly is important in the perspectives of tourism destination and attraction in Takpala. In this aspect, homegardens has significant role in tourism development. First, it is related to the effort to improve environmental quality. Second, homegarden as media for education, and third,

homegardens provides numerous goods to support tourist needs, especially for food needs.

The role of home garden to improve environmental quality comes from the fact that homegarden contains numerous plant. Besides important to provide consumable materials, homegarden able to improve environmental

quality. There are numerous beautiful plants which are contribute in beauty landscapes. Many plant are related to the cultural, and it is rarely found in other place. These become the unique component in indigenous landscape of Takpala village. Biodiversity and unique species characters in building homegarden can be introduce to the tourism accommodation in Takpala.

The diversity of species in homegardens and its cultural value is the interested object for education which are important in conservation programs. As far, there are no scenario to involve pant diversity into tourism program. Ecotourism often paid attention to the local biodiversity recognitions part of the education program.

The homegardens provides numerous fruit, vegetables, etc. which are important in supplying and providing numerous local menu. It is especially important in the development of gastronomy or culinary tourism development based on local materials.

CONCLUSION

Homegarden in Takpala exist as a human activity to modify environment as space to provide numerous goods and sources to support households daily life needs. Homegarden in Takpala contains 133 species and 55 family of plant species. The species usages mostly for cultural activity, food, construction material, fuel, medicinal plants, beverages, landscape beauty, food wrap, and handicraft. ICS and species rank can be changes influenced by changes of community perception and appreciation to species, especially in species usages.

REFERENCES

- [1] Putri, W. K., L. Hakim and J. Batoro. 2016. Ethnobotanical survey of home gardens in Pandansari and Sumberejo to support ecotourism program in Bromo Tengger Semeru National Park, Indonesia. *International Journal of Research Studies in Agricultural Sciences* 2(1), 6-12.
- [2] Ministry of Tourism Republic of Indonesia. 2017. Statistik wisatawan mancanegara, Available at: <http://www.kemenpar.go.id/asp/detil.asp.?c=110&id=3139>.
- [3] Solossa, A. H., Soemarno, I. R. Sastrahidayat and L. Hakim. 2013. Home gardens of the local community surrounding Lake Ayamaru, West Papua Province, and its consequences for tourism development and lake conservation. *Journal of*

- Biodiversity and Environmental Sciences* 3(1), 1-11.
- [4] Hakim, L. 2014. *Etnobotani dan manajemen kebun pekarangan rumah: ketahanan pangan, kesehatan dan agrowisata*. Selaras. Malang.
- [5] Mekonnen, A., A. Mekuria and A. Zemedu. 2014. The role of homegardens for in situ conservation of plant biodiversity in Holeta Town, Oromia National Regional State, Ethiopia. *International Journal of Biodiversity Conservation* 6(1), 8-16.
- [6] Batoro, J., S Indriyani and B. Yanuwadi. 2017. Ethno-ecology of Komplangan Field of the Bromo, Tengger, and Semeru Area in East Java: a qualitative approach. *Biosaintifika Journal of Biology and Biology Education* 9(1), 41-48.
- [7] Hakim, L. and N. Nakagoshi. 2007. Plant species composition in home gardens in the Tengger highland (East Java, Indonesia) and its importance for regional ecotourism planning. *Hikobia* 15(1), 23-26.
- [8] Turner, N. J. 1988. *The importance of a rose: evaluating the cultural significance of plants in Thompson and Lillooet Interior Salish*. Royal British Columbia Museum. British.
- [9] Batoro, J. 2015. *Pengelolaan lingkungan dengan pendekatan etnobiologi-etnobotani*. Universitas Brawijaya Press. Malang.
- [10] Chen, D., W. Wei and L. Chen. 2017. Effects of terracing practices on water erosion control in China: A meta-analysis. *Earth-Science Reviews* 173, 109-121.
- [11] Jayasinghe, M., A. Chai, S. Ratnasiri and C. Smith. 2017. The power of the vegetable patch: How home-grown food helps large rural households achieve economies of scale and escape poverty. *Food Policy* 73, 62-74.
- [12] DebMandal and S. Mandal, 2011. Coconut (*Cocos nucifera* L.: Areaceae): In health promotion and disease prevention, *Asian Pacific Journal of Tropical Medicine* 4(3), 241-247.
- [13] George, E., K. Ramalakshmi and L. J. M. Rao. 2008. A perception on health benefitsof coffee. *Critical Reviews in Food Science and Nutrition* 48(5), 464-486.

Community Empowerment Based on Good Tourism Governance in the Development of Tourism Destination

(Case Study of *Kawah Ijen* Tourism Buffer Zone *Kampung Kopi* Gombengsari Village, Kalipuro District,
Banyuwangi Regency)

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Abstract

One form of the current trend in community empowerment is empowerment through tourism. Banyuwangi endeavor to develop the leading tourism attraction and tourism buffer. One of the buffer tourism developed in Ijen Crater Zone is *Kampung Kopi* (Coffee Village) Gombengsari Kalipuro District, Banyuwangi. This research used qualitative method with the type of research used a descriptive case study. In data collection, researchers used observation, interview, documentation and triangulation techniques. The analysis of case study data was carried out from reading transcripts/field notes, finding common findings and taking special findings, theoretical dialogue, triangulation of data and concluding the results of the study. The results of this study indicated that the empowerment program was conducted to change and increase community awareness, knowledge and skills in order to achieve local independence while utilizing existing local potential. The implementation of tourism management in *Kampung Kopi* Gombengsari is based on several principles described as follows: a) Engagement of all Stakeholders; the actors involved are classified into five actors (Government, private, community, academia, and media) or called as the Pentahelix Model, b) Continuous resource utilization and avoid the irreversible use of non-renewable resources, c) Advocating the value of local culture through the festival. Internal supporting factor for *Kampung Kopi* Gombengsari is various tourism potential. The external supporting factor is local government, NGOs, and other tourism actors' support. The internal inhibiting factor is the level of education and the emergence of tourism business competition. External Inhibitors involved road infrastructure which requires improvement, bureaucratic structure and tendencies.

Keywords: Community Empowerment, Good Tourism Governance, Tourism Destination Development.

INTRODUCTION

In 21st century Indonesia, the development approach has shifted towards the concept of sustainable development and human-centered development that is oriented towards the whole human development. Korten explained to ran the development approach (sustainable development and community-centered development), it needs the supports from four aspects, i.e. capacity, equity, empowerment, and sustainable [1]. Etymologically, empowerment derives from the word *power* which meant strength or ability. Based on this understanding, empowerment can be interpreted as a process toward empowerment, or process to obtain power/strength/ability, and/or process of gave power/strength/ability from the party that had power to the party which is lacking of power or powerless [2].

One form of community empowerment is community empowerment through tourism. Community empowerment (local community) through tourism business activities is one of the development models which obtained attention and become an important agenda in the process of tourism development [3]. The construction of community empowerment as described above has been adopted into an economic, social and cultural development strategy implemented in the design of a community-centered tourism development.

Since 1997, tourism sector in Indonesia has become an alternative sector that grew during the crisis and was able to encourage regional development [4]. Tourism as a strategic sector and a medium that integrates programs and activities between sectors of development. Therefore tourism is very suitable to be established as a leading development that will be able to support the nation's economy. One of the areas in Indonesia who tried to develop the tourism sector is Banyuwangi Regency. Based on Banyuwangi Regional Regulation No. 13/2012 on Master Plan for Tourism Development of

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Banyuwangi Regency, tourism development is divided into three categories which are: natural, cultural and artificial tourism attraction [5]. The development of the tourism sector divided into three Tourism Development Areas (TDA) and in every TDA there is one mainstay attractions namely: TDA I with the mainstay attraction is Ijen Crater, TDA II with mainstay attraction is Plengkung Beach, and TDA III with mainstay attraction is Sukamade Beach. Tourism Development Area (TDA) is intended to facilitate the determination of character/*image* that will be highlighted and priority development of each function of the tour [6].

Tourism is a dynamic sector and highly responsive to new trends and developments [7]. The need of tourism business in accordance with market demand and product diversification that are offered in order to occur the equity of tourism effects for the local community [7]. Therefore, for developing the superior tour of *Segitiga Berlian* in Banyuwangi Regency with the economically viable concept, socially acceptable and environmentally sustainable, develop a buffer tourism destination around the leading tourist destinations was needed.

One of the potential areas developed as a tourism destination buffer in TDA I Ijen Crater is Gombengsari Village. Gombengsari Village known as *Kampung Kopi* (Coffee Village). Gombengsari is a village located in the administrative area of Kalipuro District, Banyuwangi Regency with an area of 1082.8 Ha. Gombengsari Village is divided into five Sub-village, i.e. Gombeng/Krajan, Kacangan, Lerek, Suko, and Kaliklatak. Gombengsari Village has various potentials capable to be developed which are a major component in the development as a tourist destination. These include tourist object and attraction, accessibility, amenity, supporting facilities, and institution [6].

Gombengsari Coffee Village is ecotourism area, instead of a mass tourism. Gombengsari has fulfilled three pillars of ecotourism (referring to the agreement of TIES (The International Ecotourism Society) in 1990 which was refined in 2015): nature conservation, community empowerment, and education. However, for developing Gombengsari into a tourism destination, there are several problems for example: lack of activities and tourism events, the problem of tourism institutions, lack of supporting facilities and infrastructure (means of production to develop creative economy), land ownership, damaged road infrastructure at

several destination points, tourism marketing is not optimal, and lacking of public knowledge on the importance of tourism activities. On the other hand, these issues were also related to the culture of Gombengsari community, which is influential in the development as a tourism destination.

In the context of *Kampung Kopi* Gombengsari, it requires society empowerment through tourism. Community empowerment through tourism can be interpreted as an effort which will be conducted consciously, planned, and sustainable to increase society power which has been ignored before, in order to realize good tourism governance. In general, it can be said that the society is still in a state of vulnerability during the process of tourism development. It is caused by the absence or lack of access to the existing tourism resources.

Therefore, to ensure that the tourism development managed well, sustainable, and in accordance with the principles of Good Tourism Governance, it requires a method to empower and facilitate the involvement of local communities in the development process. It also ensure to maximize the value of social and economic benefits from tourism activities. In other words, the society could benefit from the multiplier effect of tourism. The objectives and focus of this research are firstly to describes the local community empowerment in the development of *Kampung Kopi* Gombengsari Village from the perspective of attraction and tourism activities development program, amenity development program, transport/accessibility system development program, tourism marketing and promotion system development program and human resource and institutional development program. Secondly, the research aims to describe the realization of Good Tourism Governance through Community empowerment following principle of engagement of all stakeholders, sustainable resource use and Advocacy of local cultural values. Thirdly the research describes the supporting and inhibiting factors of community empowerment through the analysis of internal and external of supporting and inhibiting factors.

MATERIALS AND METHODS

Study Area and Data Collection

This research takes place in Banyuwangi Regency. The site chosen for this study is *Kampung Kopi* Gombengsari Village, in Kalipuro District. This study used a single case design on

the development of buffer tourism destinations in the Kawah Ijen Zone. Based on the data source, the data collection could utilize primary sources and secondary sources. This research used data collection techniques: observation, interview, documentation, and triangulation. Research instrument: self-researcher, interview guide, documentation tool, and field note.

Data Analysis

Analysis of case study data conducted from reading transcripts/field notes, searching for general findings and taking special findings, theoretical dialogue, and triangulation of data. Last, we conclude the results of the study [8].

RESULTS And DISCUSSION

Community Empowerment in Development of Kampung Kopi Gombengsari Village as Tourism Destination

The construction of community empowerment was adopted as a socio-economic and cultural development strategy. It is implemented in a community-centered tourism development framework that aims not only to foster and develop economic added value but also social and cultural value. The following are some community empowerment programs in developing tourism destinations *Kampung Kopi Gombengsari Village*, which was studied theoretically.

Program Development of Attraction and Tourism Activities

Kampung Kopi Gombengsari Village has various potentials that can be developed. The main potential is coffee farming and Etawa goat animal husbandry as a support and product differentiation form of tourism. Thus the tourism products offered by *Kampung Kopi Gombengsari* is based on existing local potential. The development of all potentials into attractions and tourism activities is intended to obtain multiplier effect of tourism for the Gombengsari community.

In accordance with Zanuri which mentioned previously in the introduction, tourism is a complex system in the form a system and subsystem [4]. In that sub-system, there is a form of tourist demand (motivation, preference, and expectation) and form of supply (attraction, amenity, and accessibility). Tour offers tourism products in the form of goods and services to meet the needs and desires of tourists. One form of tourism product offerings in the form of attractions and tourism activities. The tourism

attraction is a show or a unique attraction. It would suit tourist preference and capable to satisfy their desire. In *Kampung Kopi Gombengsari*, attractions and tourism activities are based on local potential which goes by the theme of coffee education (gardening, coffee harvesting, coffee roasting) and Etawa goat education (feeding Etawa goat, feeding milk to Etawa goatlings with pacifiers, milking Etawa goat). These uniqueness can be used to attract tourist visit to Gombengsari Coffee Village.

In the sub product system of tourism, there are various components that are very important to be considered in the tourism destinations development such as tourism attractions [9]. Tourism attractions are often classified based on the type and theme either in the form of nature tourism, cultural tourism, artificial tours/special interests. Furthermore, some experts argued that the attractiveness of a destination is the most important factor in order to invite tourists [10]. The following are the main requirements, in order for a tourism destination to attract tourists, a destination ought to possess:

1. something to see as special attraction
2. something to do to be conducted by tourists
3. something to buy to be bought by visiting tourists

The development of tourism attraction in Gombengsari based on the potential of nature tourism and artificial attraction. It relying in the form of tour packages of farms and plantations, cultural values of coffee picking tradition; all packed in an event/festival [11]. They described that tourism attraction become the important factor for influencing tourist to come to the destination. These attractions are grouped into five main groups namely culture, nature, events, recreation and entertainment.

Amenity Development Program

Various tourism businesses emerged in *Kampung Kopi Gombengsari*. This tourism business emerges with community-based concepts such as homestay in Gombengsari Nirvana Coffee, Anita Coffee Corner, Kopi Lego/Omah K'Ettawa, souvenir provision, tourist information center, and creative economy. Home or community-based tourism business are direct tourism actors. They possess role to produce goods/services to meet tourists needs and expectations.

Amenity/accommodation in this sense is the various types of facilities and accessories that can be used by tourists to rest, relax, stay and

possess all the necessities when visiting a destination [9]. The various tourism facilities that need to be developed in Amenity aspect consists of accommodation, restaurant, tourist information center, souvenir center/shop, means of communication, availability of clean water and electricity. The amenity includes a range of facilities to meet accommodation needs (lodging), food and beverage provision, entertainment venues, shopping venues and other services [12].

With the development of Gombengsari as a tourism destination successfully spur the growth of a creative economy. The creative economy is essentially an economic activity that prioritizes the creativity of thinking to create something new and different that has value and is commercial [13]. There are four types of creativity that can shape the creative economy that is as follows:

1. Scientific creativity
2. Economic creativity
3. Culture such as art, movie, and other types of artworks.
4. Technological creativity

Transport/Accessibility Development Program

Local governments are deeply committed in improving tourism services; in particular to open accessibility. Starting from the increased capacity of the airport to provide tourist transportation by empowering the rent car community in Banyuwangi. Gombengsari coffee village is trying to maintain and preserve nature by launching cycling activities for tourists. This cycling invites tourists to tour *Kampung Kopi* by bicycle. This is because Gombengsari is basically ecotourism destination with various local potential. The use of a bicycle is to roam Gombengsari Coffee Village, as an effort to adjust to ecosystem ecotourism destination.

The means of transportation is very important in the management of tourism, which is not only for visitor satisfaction but also for the sustainability of ecotourism management [14]. Therefore infrastructure development needs a careful planning and management. It is not only for the benefit of management or visitors but also to accommodate the needs and livelihoods of local people and to adapt or to be within the ecosystem of ecotourism destinations.

Tourism Marketing and Promotion System Development Program

There are various efforts made by the Government of Banyuwangi Regency to attract

tourists to come to Banyuwangi. It is including Online Tourism Marketing such as social media, web of *Banyuwangi Tourism*, and *Banyuwangi in Your Hand*, Familiarization Trip (Famtrip), Banyuwangi Festival, Tour Packages, print media, and Banyuwangi Mall. For the scope in Gombengsari, they conducted Online Tourism Marketing, Famtrip and held several festivals.

In tourism marketing, technology inclusion is called Online Tourism Marketing (OTM). OTM is an effort to sell tourism products/services and build relationships with travelers using the internet. OTM able to overcome the geographic boundaries of the country and is able to increase access to global supply chains [15]. OTM is trying to offer various tourism potentials with a wide range. Therefore it is capable of attracting tourists, both local and foreign tourists. The role of social media in tourism marketing is great because social media focuses on inviting new travelers, influences purchasing decisions, attracting existing customers, and useful in responding to feedback and criticism [15].

In addition to marketing tourism products through online tourism marketing, *Kampung Kopi* Gombengsari also includes products of coffee plantations to Banyuwangi Mall. Banyuwangi Mall is a website owned by the Office of Cooperatives and Micro Enterprises of Banyuwangi Regency to display and promote the products of SMEs (Small and Medium Enterprises) in Banyuwangi. The basis of its regulation is the Regent Regulation No. 49 of 2011 on Clinical Services of Cooperatives and SMEs [16]. Therefore, an idea of mentoring SMEs about marketing was emerged. Online SMEs marketing in Banyuwangi is very appropriate, considering that the development of information technology possesses impact on changes in community behavior, especially consumers as well as producers [17]. The increasing online retailing in the world is an evident that more and more consumers are accustomed to using the internet in their daily activities, where one of their activities is online commerce (E-Commerce). In E-Commerce, consumers interact with each other to exchange goods by utilizing the internet. Communication is done by an individual selling products/services directly to other individuals. With the existence of E-Commerce, Banyuwangi Mall is expected to be a support for *Kampung Kopi* Gombengsari SMEs business particularly and Banyuwangi in general.

Human Resource and Institution Development Program

The success of a tourism activity is determined by the quality of social interaction that occurs between the tourists with the organization on the tourism area that handles it. The existence of an organization that engaged in the field of tourism can be implemented at the community level, private/industrial or business, and government level. The organization facilitate the management and accelerate the achievement of tourism development goals. The human resources development in tourism is the development of the potential human beings to realize its role as an adaptive and transformative social creature which capable of managing itself. It also included the nature potential towards the achievement of the life welfare in a balanced and sustainable order in the field of tourism [3]. Based on the statement above, there are several efforts made to develop human resources in Banyuwangi tourism which is described as follows.

- a. Competence; an effort to improve competency through a village-based foreign language course.
- b. Training for BUMDes (village owned business enterprise); management training, homestay management training and internet marketing training.
- c. Certification; the guide certification process, the process of guarantee on halal products.

The existing tourism institute in Gombengsari is Tourism Awareness Group UPAKARTI GNC (*Unggulan Pemuda Kreatif* Gombengsari Nirvana Coffee). In addition, there are *Pokdarwis* (Regional Tourism Awareness Institution) in village level. There's also *Pokmas* (Community Group) in each neighborhood. For example, Suko Sub-village has Community Group named Forest Village Community Institution (LMDH) Rimba Sejahtera in cooperation with Perum PERHUTANI (State Forest Enterprise) KPH West Banyuwangi to manage one of the destinations in *Kampung Kopi* Gombengsari namely Pine Forest.

The institution in *Kampung Kopi* Gombengsari is in line with Sunaryo's statement [15] that tourism and tourism human resources in this sense are the whole organization or institution of tourism management including its supporting human resources, related to the tourist destination management from government, private and community elements. Due to the wide scope of tourism, the tourism development

will not be implemented alone by the developer without involving other parties. The synergy of the various institutions will guarantee the success of tourism development. To accelerate the synergy of various elements, the government as the owner of territorial authority can play a more progressive role, e.g. implementing the empowerment of tourism institutions that have grown in the community. That way, this tourism institution can play a bigger role in the tourism development in the region. Development of the institution in question is such as the formation of tourism awareness group [4].

Community empowerment program in developing tourism destination of *Kampung Kopi* Gombengsari aimed to improve two main aspects. These are a physical and social improvement. This is in accordance with previous study which suggested the objectives of empowerment include the following various improvement measures [18]:

- a. Institution Improvement (*better institution*)
- b. Business improvement (*better business*)
- c. Income improvement (*better income*)
- d. Environment improvement (*better environment*)
- e. Living condition improvement (*better living*)
- f. Community improvement (*better community*)

Achieving community independence cannot be done instantly, it require a process. The stages of community empowerment [2] in *Kampung Kopi* Gombengsari in developing their tourism destinations is described as follows:

- a. The stage of awareness and the formation of behaviors toward conscious and caring behavior to encourage the need for increased self-capacity; the community was educated on the importance of explore local potential and making it a high value. Initially, people only sell coffee beans which are relatively cheap. Then people began to think strategies to increase the selling value through coffee roasting and educational tour packages.
- b. The stage of transformation capability in the form of knowledge insight, skills to provide insight and basic skills, thus locals are capable of taking a role in tourism development. At this stage, Gombengsari community began to be given various counseling and training related to tourism development by improving various local potency. For example training of tourism destination development, tour guide

training, counseling on coffee cultivation and Etawa goat animal husbandry.

- c. The stage of intellectual ability and skills improvement to create innovation, initiative, and ability to lead independently. In this stage, the public has started to understand producing tour packages, how to read the opportunities for tourism potential such as the emergence of cafe serving local coffee, home industry related to the provision of souvenirs, and processing various local products such as coffee and Etawa milk.

Based on the above explanation, it exhibited that the empowerment of the community in the tourism development destinations Gombengsari coffee village is an *aras mezzo* empowerment strategy. The empowerment program is done to change and increase awareness, knowledge, and skills of the community in order to achieve local independence while still utilizing local potential. The main potency of Gombengsari is coffee, Etawa goat, and natural potencies. With that potential, communities are empowered through tourism with a view to economic advantage, preserving local cultural and traditional identity, preserving the natural conservation and improving social welfare that can ultimately bring local self-sufficiency.

Realizing Good Tourism Governance through Community Empowerment in *Kampung Kopi* Gombengsari

The development of tourism destinations will certainly bring the possibility of positive and negative impacts. The impacts depend on the management and governance of tourism played by all stakeholders from the government, industry, and community in the destination area. The achievement of tourism development objectives and missions will be accomplished only if the process was done through the principles of good tourism governance. The following are the implementation of tourism governance in *Kampung Kopi* Gombengsari based on several principles.

Engagement of All Stakeholders

The development of Gombengsari village as a tourism destination involved many actors with their respective roles. In the government sector, there are several units involved, e.g. Department of Culture and Tourism, Department of Cooperatives and Micro Enterprises, Agriculture Service, *Perhutani* (State Forest Enterprise). In the private sector/NGOs, there are involvement

of BPW (Travel Agency) and Hidora (*Hiduplah Indonesia Raya*), this community is concerned to assist the young generation of Banyuwangi to love with the potential of their region. Society has existing community groups (*Pokmas*) and tourism awareness group (*Pokdarwis*) UPAKARTI GNC. There is also the involvement of universities/academics to provide assistance and community service, and there are social media teams and journalists who help to online tourism marketing.

Based on the results, the actors in tourism development in *Kampung Kopi* Gombengsari are not only three pillars (government, private, and community) but they can be classified into five actors (government, private, community, academic, and media). This in line with Kardono statement (the Special Staff of the Minister of Tourism, Republic of Indonesia in the field of media and communications) that in tourism development actors are reflected in Pentahelix Model [19] as shown in Figure 1.

The context of improving the ecosystem of tourism destination governance can encourage the role of the tourism sector to become drivers/co-drivers by deploying Academician, Businessmen, Community, Government, and Media (ABCGM) into the Pentahelix scheme. It is implemented by building complementary environments and links to realize quality of activities, capacity and services of tourism that provide benefits to the environment and society. Academics act as conceptor (standardization, certification), Businessmen as enabler, Community as the accelerator (accelerate the digital lifestyle), Government as regulator (tourism infrastructure, an incentive for investors, free visa), and Media as the catalyst (brand awareness, brand image). This is in line with Calzada's statement [20] that Penta Helix is a socio-economic development model that encourages economic knowledge to pursue innovation and entrepreneurship through collaboration and profitable partnerships between academia, government, industry, NGOs, and civil society sector and social entrepreneurs. The Penta Helix model is rooted in Triple Helix Etzkowitz and Leyesdorff [20] as exhibited in the following Figure 2.

Sustainable Resource Usage

The results showed that to encourage sustainable resource usage and to avoid the irreversible resource usage is by back to nature and maintain local wisdom such as Utilization of

goat dung as biogas and fertilizers, and utilize livestock to transport the plantation products. This was conducted to avoid excessive use of fuel and reduce air pollution from motor vehicle fumes.

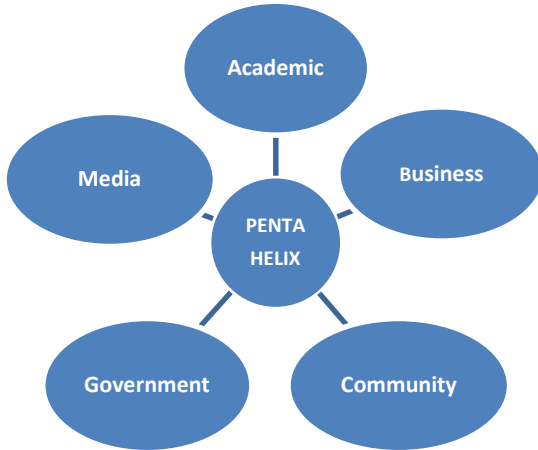


Figure 1. PentaHelix Model in Tourism Sector.
Source: Kardono [19]

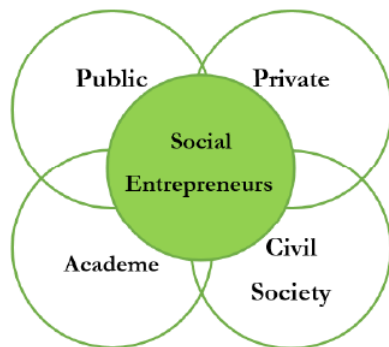


Figure 2. Pentahelix Model. Source: Halibas et al [20].

To maintain environmental sustainability and to avoid significant environmental changes from the negative impacts of tourism activities, it is necessary to change the mindset focus on the growth orientation to the tourism development that promotes sustainability, preservation, and environmental awareness [9]. The sustainable tourism development is illustrated in the following Figure 3.

The tourism development need to consider the occurrence of conformity between tourism development activities with the scale, condition, and character of regional development [4]. The existing tourism resources can still support the needs of tourists, therefore, tourism can take place in a sustainable manner. Therefore, the development should ensure that tourism development does not damage the environment.

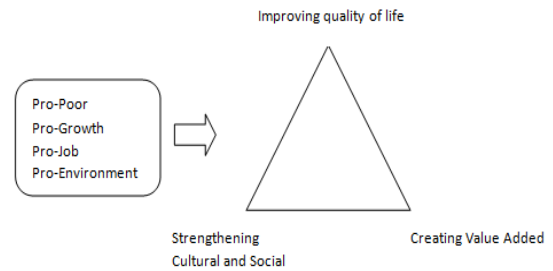


Figure 3. Sustainable Tourism Development
Source: Ratman [21]

Advocacy of Local Culture Values

Various ways were conducted to promote and advocate the local culture of Gombengsari community; starting from packing local culture in a festival. An annual tradition such as *Suro Pesucian* in Banyu Caruk and Buyut Kacur gravesite is full of mysticism and sanctity as historical and religious tour. These efforts imply that the Gombengsari people possess strong ancestral traditions which are open to tourists, with tourists have to adjust to Gombengsari tradition. Tourists must comply with the rules and norms that are used by local community *adat* (traditional) institutions.

This is explained that the tourism development should pay attention to advocacy and activities that strengthen the character and cultural identity of local communities as well [9]. Activities that exhibit the character and cultural identity of the local community will realize a good quality tourism experience and can provide satisfaction for tourists.

The community empowerment approach in tourism development is done because local people are the ones who know best about their local socio-cultural conditions. Every development activity must consider the socio-cultural values that are developed in the planning area [4]. Therefore, every step of the planning decision should reflect the spirit and inspiration of the local people who are actively involved in it. In connection with the tourism development in *Kampung Kopi* Gombengsari, efforts to empower local communities was done in order to advance the local community's living condition to obtain multiplier effect of tourism while preserving its local cultural identity and traditions.

Supporting and Inhibiting Factors of Community Empowerment Based on Good Tourism Governance

Supporting Factor

Internal Supports: Gombengsari Village has a wide range of potentials (Gombengsari has a

variety of tourism potentials classified as ecotourism). It indicates that *Kampung Kopi* Gombengsari has the social, cultural, physical, economic and local resources which capable to support development as a tourism destination. The main capital in the tourism development destinations as proposed by experts explained that the development framework of tourism destinations should at least include the following main components [9,22]: attractions, accessibility, amenities, supporting facilities (ancillary service), and institutions.

External Supports: It consist of existing support capacity which emerged from various tourism stakeholders that synergize in developing *Kampung Kopi* Gombengsari into a tourism destination. There are several determinants that can support the success of tourism destinations development; one of which is the political support [9]. In this case, it is the policy of the local government and the commitment of the Regent to make Banyuwangi as a tourism destination. Actors and stakeholders are actively and productively involved several parties such as NGOs, volunteer groups, and other influential and interested parties who get benefit from tourism activities.

Inhibiting Factor

Internal Inhibitors: The level of community education influences the development of the tourism destination because it leads to different thinking process/perception. Some groups refuse tourism development using local traditions and religious norms. In addition, there are still different opinion from *Pokdarwis* UPAKARTI GNC related to branding development. Therefore, current condition is still ego sectoral in every *Pokmas* (community group). The other inhibiting factor are some people still using traditional/manual production tools which cannot meet the production capacity required by market demand.

To overcome the various problems that become obstacles in the development of *Kampung Kopi* Gombengsari, we need government's role. The implementation of tourism development can be carried out properly and effectively to realize sustainable tourism. Thus, the human resources require competences in the tourism field [4]; which the preparation of human resources is the task of the state/local government. On the other hand, a regulation is required to minimize unhealthy business competition between excessive tourism businesses. The regulation is necessary to ensure

good competition and the creation of an integrated tourism business entity.

External Inhibitors: The provision and improvement of road infrastructure is needed since there are still some damaged road points to the destination. The obstacles also found in bureaucratic structures and tendencies, e.g. in proposals for tourism events, and arranging homemade industry licensing for Gombengsari's superior products (such as coffee and dairy of Etawa goat). Related to the provision of infrastructure at some point to the destination in *Kampung Kopi* Gombengsari, is the role and responsibility of the government. It need to consider the ability of the government to provide tourism infrastructure such as road/access to destinations [4].

The trends of the implementers are exhibited from how far their support and commitment, behavior/habits, character, and culture in running the policy or the program. These trends can have consequences in the implementation of policies/programs. The disposition points to the characteristics are closely attached to the policy/program implementer [23].

Important characters that should be owned by the implementer is honesty, commitment and democratic. Winarno [24] added that trends may hinder implementation if the executors completely disagree with the substance of a policy. In the context of *Kampung Kopi* Gombengsari, this occurs on proposing submission activities or tourism events, because there are differences of opinion related to the implementation of the event.

The bureaucratic structure usually refers to systems and mechanisms or procedures. The system deals with what is used to reduce bureaucratic pathology. In this case, the system is needed to reduce the convoluted and long process. While the mechanism or procedure is clear, it needed to have a reference in the act.

This aspect of a bureaucratic structure includes two important aspects: the mechanism and structure of the implementer organization itself [23]. Implementation mechanisms are usually established through Standard Operating Procedures (SOPs) which are used as a reference for the implementers. The organization structure of the implementer should concern to avoid the convoluted, long and complex bureaucracy. Related to this study, the management of homemade industry licensing for coffee and Etawa dairy products is considered to last for approximately 6 days - 3 months. In the end, the

community tries to open their own marketing network without using Banyuwangi Mall.

CONCLUSION

The empowerment of the community in the tourism development destinations of Gombengsari coffee village is an *aras mezzo* empowerment strategy. The empowerment program is done to change and increase awareness, knowledge, and skills of the community in order to achieve local independence while still utilizing local potential. The main potency of Gombengsari coffee village is coffee, Etawa goat, and natural potency. With that potential, communities are empowered through tourism with a view to economic advantage, preserving local cultural and traditional identity, preserving the natural conservation and improving social welfare that can ultimately realize local self-sufficiency.

Implementation of tourism governance in *Kampung Kopi* Gombengsari has been running well based on several predetermined principles. However, it is important to note the continuity in the application of these principles.

Factors that support and inhibit the Community Empowerment-based on Good Tourism Governance in *Kampung Kopi* Gombengsari:

- a. Supporting Factors: Internal Supporters, Gombengsari Coffee Village has various tourism potentials. External support: existing support capacity both from local government, NGO and other tourism actors.
- b. Inhibiting factors: Internal Inhibitors, education level and the emergence of tourism business competition. External Inhibitors, road infrastructure still needs improvement, bureaucratic structures, and tendencies.

REFERENCES

- [1] Suryono, A. 2010. Dimensi-dimensi Prima teori pembangunan. Universitas Brawijaya Press. Malang.
- [2] Laverack, G. 2005. Using a 'domains' approach to build community empowerment. *Community Development Journal* 41(1), 4-12.
- [3] Tosun, C. 2000. Limits to community participation in the tourism development process in developing countries. *Tourism Management* 21(6), 613-633.
- [4] Zaenuri, M. 2012. Perencanaan strategis kepariwisataan daerah konsep dan aplikasi. E-Gov Publishing. Yogyakarta.
- [5] Banyuwangi Regency. 2012. Regional regulation No. 13/2012 on master plan for tourism development of Banyuwangi Regency. Banyuwangi Regency. Banyuwangi.
- [6] Hakim, L. 2017. Cultural landscape preservation and ecotourism development in Blambangan Biosphere Reserve, East Java. In: Hong, S. K. and N. Nakagoshi (Eds). *Landscape Ecology for Sustainable Society*. Springer, Cham. 341-358.
- [7] Suardana, I. W. and N. M. Ariani. 2011. Penataan kemitraan dan kelembagaan Desa Wisata Tista Kecamatan Kerambitan Kabupaten Tabanan. *Udayana Mengabdikan* 10(1), 41-45.
- [8] Cracolici, M. F. and P. Nijkamp. 2009. The attractiveness and competitiveness of tourist destinations: A study of Southern Italian regions. *Tourism Management* 30(3), 336-344.
- [9] Sunaryo, B. 2013. Kebijakan pembangunan destinasi pariwisata. Gava Media. Yogyakarta.
- [10] Yoeti, O. A. 2006. *Tours and Travel Marketing*. Pradnya Paramita. Jakarta.
- [11] Abdulhaji, S. and I. S. Yusuf. 2016. Pengaruh atraksi, aksesibilitas dan fasilitas terhadap citra objek wisata Danau Tolire Besar di Kota Ternate. *Jurnal Penelitian Humano* 7(2), 134-148.
- [12] Khotimah, K., Wilopo and L. Hakim. 2017. Strategi pengembangan destinasi pariwisata budaya (studi kasus pada kawasan Situs Trowulan sebagai pariwisata budaya unggulan di Kabupaten Mojokerto). *Jurnal Administrasi Bisnis* 41(1), 56-65.
- [13] Suryana. 2013. *Ekonomi Kreatif – ekonomi baru: mengubah ide dan menciptakan peluang*. Salemba Empat. Jakarta.
- [14] Nugroho, I. 2011. *Ekowisata dan pembangunan berkelanjutan*. Pustaka Pelajar. Yogyakarta.
- [15] Hasan, A. 2015. *Tourism marketing*. CAPS. Yogyakarta.
- [16] Banyuwangi Regency. 2011. Regent of Banyuwangi Regulation No. 49 about Clinical Services of Cooperatives and SMEs. Banyuwangi Regency. Banyuwangi.
- [17] Wilantara, R. F. and Susilawati. 2016. *Strategi dan kebijakan pengembangan UMKM*. PT. Refika Aditama. Bandung.
- [18] Theresia, A., K. Andini, P. Nugraha and T. Mardikanto. 2014. *Pembangunan Berbasis Masyarakat*. Alfabeta. Bandung.

- [19] Kardono, D. 2017. Generasi pesona Indonesia. The 4th National Coordination Meeting of Tourism. Jakarta.
- [20] Halibas, Sibayan, and Maata. 2017. The Penta Helix Model of innovation in Oman: An Hei Perspective. *Interdisciplinary Journal of Information, Knowledge and Management* 12, 159-174.
- [21] Ratman, D. R. 2017. Pengembangan destinasi dan industri pariwisata. Kementerian Pariwisata. Jakarta.
- [22] Cooper, C., J. Fletcher, A. Fyall, D. Gilbertand S. Wanhill. 2008. *Tourism: principles and practice*, 4th Ed. Pearson Education. Harlow.
- [23] Indiahono, D. 2009. *Perbandingan administrasi publik: model, konsep dan aplikasi*. Gava Media. Yogyakarta.
- [24] Winarno, B. 2002. *Teori dan proses kebijakan publik*. Media. Yogyakarta.

Water Pollution Index Approaches in Spatial Planning in City Tourism Area (Case Study: Malang Area)

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Abstract

As a famous tourism destination in Indonesia, Malang Raya has many interesting places for visiting, like river. River becomes an important part in tourism spatial planning of a region, because almost all the waste from human activities dumped into the river, thus it will affect the quality of the river water. Malang Raya passed by 12 sub-watersheds whereas 4 of them passed 3 districts/cities, namely Metro, Bango, Amprong and Manten sub-watershed. Therefore, it needs an integrated spatial planning between the three regions, especially to support tourism destination. The purpose of this research is to formulate water carrying capacity assessment and its recommendation in spatial planning in Malang area. This is a quantitative-descriptive study using regular monitoring of water quality in 20 rivers surrounding Malang Raya by Malang Department of Environment. The results of this study show that the sub-watershed area of Metro, Bango, Amprong and Manten are classified into mild contaminated. This condition, one of them, is caused by land use changing in upstream areas. A bit more pollution in the river will affect the number of tourist visits to Malang Raya area.

Keywords: Amprong, Bango, Manten, Metro, sub-watershed, water pollution index.

INTRODUCTION

Today environmental issues are corrective discourse against the paradigm of development in Indonesia. The occurrence of the crisis on the environment increasingly clarifies the existence of biased development planning between economics growth with the environment. Economic development caused destruction of natural resources and environmental pollution. Many people considered that implementation of regional autonomy caused pollution and environmental destruction in every part of people's life [1]. Local government prioritized economic growth and override environmental conditions. Consequently, the cost of restoring the environment to the government and the community is far greater than the economic benefits it earns. The World Bank in 2007 reported that the economic costs of land damage in Indonesia amounted to US \$ 562 million. This value is smaller than air pollution damage (US \$ 5.5 billion) and water pollution, sanitation and hygiene (US \$ 7.7 billion) [2].

Therefore, a water carrying capacity (WCC) assessment is needed which provides recommendations for environmental improve-

ment efforts and a picture of land suitability if improvement efforts are made. In addition, WCC assessment can provide input to the evaluation of regional spatial plans (RTRW) of a region, because it contains a planning instrument that explains the relationship between humans, environment and land use [3].

This study assess the ability of the river to accommodate pollution loads with physical parameters (temperature and TSS) chemistry parameters (pH, BOD, COD, DO, NH₃, NO₃, NO₂, Detergent, Oil and Grease, Total Phosphor) and biology parameters (Total Coliform and Fecal Coli) using the Water Pollution Index device (WPI). The aims of this study are formulating water pollution index (WPI) assessment in Malang area. We also give recommendations for spatial planning to support tourism program in Malang Area.

RESEARCH METHOD

Study Area

We use a quantitative-descriptive assessment using regular monitoring of water quality data in 20 rivers surrounding Malang Raya area by Environmental Dept. of Malang Regency. Brantas Watershed consists of 36 subwatersheds passes 9 districts/cities in East Java Province. Of these, there are 4 sub-watersheds (DAS) pass directly through Malang Raya, as tourism area, i.e. Metro, Bango, Amprong, and Manten.

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Upstream of DAS Metro is located in Batu City, flowing eastwards through Dau sub-district (Malang Regency) turning south through west side of Malang and towards Lahor Dam in Sumberpucung Sub-district (Malang Regency). Meanwhile, the upstream of DAS Bango is located in Kecamatan Singosari and Karangploso (Malang Regency) flowing to the north side of Malang City towards the central part of the City, meeting with Amprong River flow which is upstream in Poncokusumo District (Malang Regency). Manten Watershed also has a river upstream in the southern part of Poncokusumo Sub-district passing through the central part of Malang Regency and ends, along with the Amprong River and Bango, at the Karangates Dam.

Sampling Point

Environmental Dept. of Malang District always conduct regular water quality monitoring to 30 rivers which is covered 6 sub watersheds which is 4 sub watershed matches with this area of study (Supplementary 1). Location of water sampling is designed from upstream to downstream in order to know the tendency of water pollution along river. This recommendation will be used by Environmental Dept. of Malang District (DLH) as input in arranging program to control water contamination along stream monitored. For two years, DLH has taken six times sampling, twice in 2016 (March and June) and four times in 2017 (March, May, July and September. Finally, the results compared by analysis during the rainy and dry seasons.

Data Analysis

Water pollution index

The Water Pollution Index are used to determine the level of pollution relative to the allowed water quality parameters [4]. WPI is determined from resultant maximum value and mean value of each parameter concentration ratio to its standard value, following this equation.

$$P_{ij} = \sqrt{\frac{(C_i/L_{ij})_M^2 + (C_i/L_{ij})_R^2}{2}}$$

Description:

L_{ij} : concentration of water quality parameters - listed in water quality standard (j),

C_i : concentration of water quality parameters (i)

P_{ij} : Pollution Index for designation (j),

$(C_i/L_{ij})_M$: maximum C_i/L_{ij} value

$(C_i/L_{ij})_R$: Average C_i/L_{ij} value

Determination of water pollution status described as follows [4]:

- $0 \leq P_{ij} \leq 1.0$ Good condition
- $1.0 < P_{ij} \leq 5.0$ Mild Contaminated
- $5.0 < P_{ij} \leq 10$ Medium Contaminated
- $P_{ij} > 10.0$ Severe Contaminated

Correlation of water quality and rainfall

We analyzed the correlation between water quality in the river and rainfall occurring at the time of water sampling. In this case, we use Pearson Product Moment (PPM) approaches as follows [5]:

$$r = \frac{N\Sigma xy - \Sigma x\Sigma y}{\sqrt{N\Sigma x^2 - (\Sigma x)^2} \sqrt{N\Sigma y^2 - (\Sigma y)^2}}$$

Description:

r = coeff. Correlation of *Pearson Product Moment*

N = number of x and y data pairs

The pattern or form of relationship between two variables can be positively or negatively correlated. If the value of the correlation coefficient is close to the value of +1, then the x and y data pair are strongly positive linear correlates and vice versa. The strength correlation between x and y follows the criterion formula in Table 2.

Table 2. Criteria of Correlation

Coeff. Correlation r	Interpretation
0.8 – 1.0	Very High
0.6 – 0.8	High
0.4 – 0.6	Moderate
0.2 – 0.4	Low
0.0 – 0.2	Very Low

Source: Guilford (1956) [5]

RESULT AND DISCUSSION

Water Pollution Index in Metro Sub watershed

The results of analysis conducted in 2016 at all sampling point shown that status of the water quality of the Metro Sub watershed is mild contaminated. The same results are shown in 2017, at the same location of sampling, i.e. mild contaminated. In Figure 1, it can be seen that mild contaminated status for each river is very volatile with sampling time. Previous research revealed that the quality of river water from upstream to downstream that has changed from good to mild contamination [6].

In the upstream of the Metro River, the performance of Metro sub watershed is poor [7]. This condition is caused by the vegetation area only 57.92%. The expansion of settlements is the cause of the reduced extent of vegetation.

Reduced vegetation area causes triple surface runoff up to 12 times (2002 - 2014).

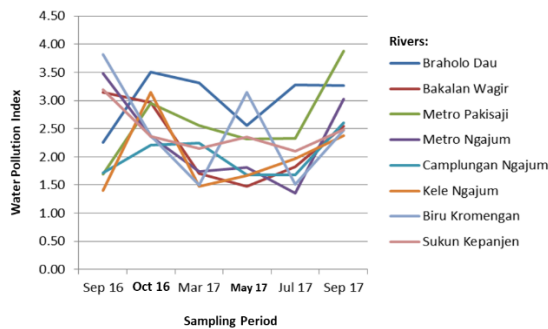


Figure 1. Water Quality Status of Rivers in Metro Sub watershed during 2016-2017

In the downstream, the poor quality of river along the Metro River is indicated by high levels of COD. The high levels of COD are presumed to be due to factories disposing of waste in Metro River [8]. These factories are produce of organic waste that are difficult to degrade naturally, such as leather, rubber, paper, and tapioca flour mills. These degradable organic wastes cause high COD values at most points of water sampling. In addition, poor water quality also caused by the waste that comes from animal slaughterhouses, jelly, cigarette, and pig farms along Metro River.

Water Pollution Index in Bango Subwatershed

The results of analysis conducted in 2016 at all sampling points shown that status of the water quality of the Bango Subwatershed is mild contaminated. The same results are shown in 2017, at the same location of sampling, i.e. mild contaminated as shown in Figure 2.

The poor water quality along Bango and Amprong rivers are caused by the changed land covering during 1999-2013 [9]. It can trigger land erosion, raising runoff debit and decreasing water quality. Finally, caused low performance of sub watershed. In addition, changed on land covering decrease the water quality in water springs surround the sub watershed. Eight springs in Karangploso (Bango sub watershed area), namely PraNyolo, Ngenep, Umbulan, Langgar, Balittas, Lowoksari, Leses and Soko) indicated that it is not suitable to be used as raw drinking water based on Government Regulation No. 82/2001 on Water Quality Management and Water Pollution Control [10]. The most visible indications are the levels of DO (all springs), nitrite (PraNyolo spring) and nitrate (Langgar, Balittas, Lowoksari, Leses, Soko springs) which were below the established standard. Even the

toxic contaminants' level of pollution is higher according to the Shannon-Wiener index, the level of organic matter contamination decreases in the channel along with the progressive way from the springs [11].

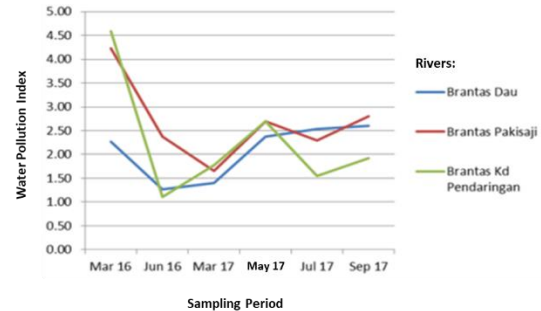


Figure 2. Water Quality Status of Rivers in Bango Sub watershed during 2016-2017

The same conditions in Singosari shown that human activities occurring in the channel of Sumberawan, i.e. agriculture, livestock, settlement and toilets have affected the water quality. It was seen from the decreasing of water quality from upstream to downstream. The indicator that emerges is a change in benthic macroinvertebrate community structure along the channel up to approximately 800 m from springs [12,13].

Water Pollution Index in Amprong Sub watershed

The results of analysis conducted in 2016 at all sampling points shown that status of the water quality of the Amprong Subwatershed is mild contaminated. The same results are shown in 2017 (Fig. 3). Only one sample was shown below the established standard. The sample was taken from June 2016 in Amprong River, Poncokusumo.

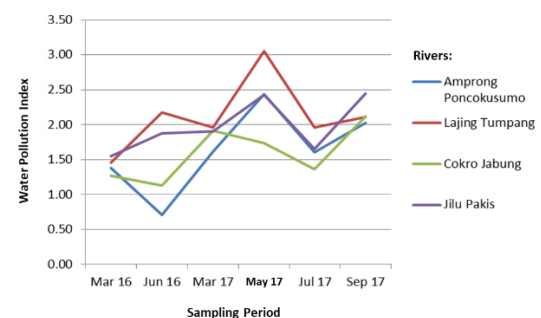


Figure 3. Water Quality Status of Rivers in Amprong Sub watershed during 2016-2017

Water Pollution Index in Manten Subwatershed

The results of analysis conducted in 2016 at all sampling point locations shown that the water quality in Manten Sub watershed is mild

contaminated, as well as the results in 2017 (Fig. 4). However, two samples were shown below the standard. The sample was taken from September 2016 in Brantas River, i.e. Kecopokan and Sumberpucung.

Water Pollution Index analysis showed that in Manten Sub-watershed, there are two samples has value below the established standard. It is likely due to low rainfall in June and September where the sample is taken. At low rainfall (dry season), there is no rain flow that carries organic material, so that the quality of water measured below the established standard.

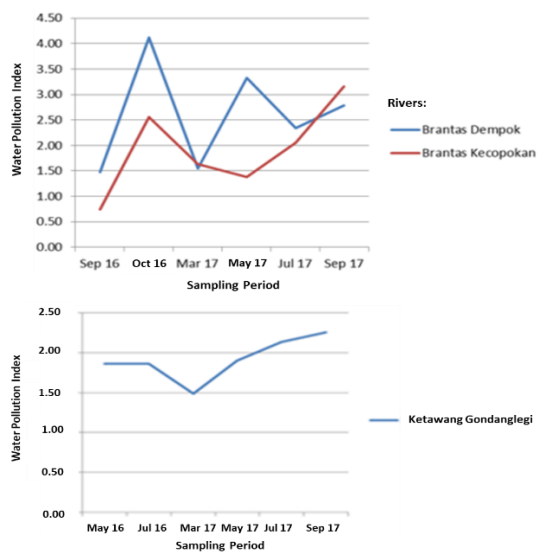


Figure 4. Water Quality Status of Rivers in Manten Sub watershed during 2016-2017

Correlation of Water Quality and Rainfall

The correlation between rainfall and quality status of river is shown in Table 3. Only two rivers (Brantas Dempok and Brantas Dau) shown that rainfall has high relationship with water quality in negative linear correlates. Brantas River in Dempok located in downstream and Brantas River in Dau located in Upstream. It is concluded that the most water quality in the rivers have no relationship with rainfall.

In general, observations of 13 parameters tested showed that only TSS, DO, BOD, COD and nitrite that greatly affected the quality of river water. Other parameters measured are still below the quality standards required in Regional Regulation No. 2 of 2008 on Water Quality Management and Water Pollution Control in East Java Province Class II. Thus, it is not affected the measurement on quality of river water.

High concentrations of TSS affect turbidity and clarity of water so that it will affect the

process of photosynthesis. Finally, it will affect the process of purification in natural water (self-purification) because the process of photosynthesis was inhibited [8]. In other hand, low DO levels indicate the presence of contamination of organic matter within the river. Human activities such as agriculture and waste disposal causing decrease of DO [14].

Table 3. Coefficient Corelation of PPM in each River

River	Coeff. Corelation
Braholo Dau	-0.00147172
Bakalan Wagir	-0.23758466
Metro Pakisaji	-0.274
Metro Ngajum	-0.470
Camplungan Ngajum	-0.073
Kele Ngajum	-0.484
Biru Kromengan	-0.599
Sukun Kepanjen	-0.498
Kali Curah Singosari	-0.130
Kalibodo Ngijo	0.279
Amprong Poncokusumo	-0.372
Lajing Tumpang	-0.378
Cokro Jabung	-0.008
Jilu Pakis	-0.411
Brantas Dau	-0.757
Brantas Pakisaji	-0.278
Brantas Kd Pendaringan	0.045
Ketawang Gondanglegi	0.127
Brantas Dempok	-0.849
Brantas Kecopokan	-0.567

Source: Result Analysis, 2017

High BOD value is caused by waste disposal from settlement and farmland [15]. Meanwhile, High level of COD indicates the greater level of pollution [16]. Those are likely to be caused by industrial waste discharges that surround the river [8].

RECOMMENDATION

It needs serious efforts from 3 stakeholders in Malang Raya to make the river better in other to support tourism in aspects:

- 1) Spatial Planning
 - a. Added Green Open Space (RTH), based on regulation of the minister of public works no. 5/2008. There are 2 type of RTH, private (10%) and public (20%).
 - b. Fulfillment of domestic wastewater treatment facilities should be in line with population growth rates and its distribution [17].
 - c. Structuring of settlements around riverbanks and other slums area.
- 2) Policies and Regulation
 - a. Withstand the rate of land-use changing by arranging regulations for the development of horizontal housing

- b. Supervision and evaluation on the performance of industrial waste treatment plants located around the river [18].
 - c. Law enforcement coupled with economic and financial policies that encourage industries to implement preventive waste reduction efforts from their sources [17].
 - d. Harmonization by all parties in waste water management planning with socio-economic aspects [19,20].
- 3) Technical
- a. Water Replenish Program by: constructive conservation, i.e. making absorption wells, and check dam or catchment, eco-drainage and biopore holes.
 - b. Water Use Savings by: domestic wastewater treatment and reuse, implement progressive tariffs, recognizing technical and non technical leakage, reward and punishment to water customers
 - c. Vegetative Conservation. This type of conservation is suitable for plantation and forest land, or in protected areas around the spring with a radius of more than 200 m [15]
 - d. Mechanical Conservation. This type of conservation is all physical, mechanical and building work done on the ground, aimed at reducing run-off, erosion and improving the soil's ability class [17].
- 4) Public and Private Involvement
- a. Increasing environmental awareness and education to the community through inserting water management in school curricula, involving community in conservation program, Strengthening institutions in the community regarding environmental management by synergic coaching, training, extension and counseling together with local organization organizations, NGOs and other donor agencies
 - b. Involving private sector in conservation, especially in the management of CSR funds (Corporate Social Responsibility) directed to environmental issues
 - c. Development of Tourism Village around Conservation Area

CONCLUSION

Water quality of 20 rivers in 4 sub watershed which pass directly through Malang Raya, as tourism area, i.e. Metro, Bango, Amprong, and Manten show mild contaminated status, based on the water pollution index.

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REFERENCES

- [1] Wijoyo, S. 2005. *Otoda: dari mana dimulai*. Airlangga University Press. Surabaya.
- [2] Anonim. Investing In A More Sustainable Indonesia. Report No. 50762 – ID, World Bank. 2007.
- [3] Brontowiyono, W. 2016. *Kajian Lingkungan Hidup Strategis untuk RTRW dengan pendekatan daya dukung lingkungan*. Andi Publisher. Yogyakarta.
- [4] Nemerow, N. L. and H. Sumitomo. 1970. Benefits of water quality enhancement. Report No. 16110 DAJ, prepared for the U.S. Environmental Protection Agency. December 1970. Syracuse University, Syracuse, New York, United States.
- [5] Muttaqin, A., Tukiyyat, Purwadi and T. H. Seto. 2014. Korelasi antara data curah hujan penakar manual dan TRMM (Tropical Rainfall Measuring Mission) Giovanni Tovas. (studi kasus teknologi modifikasi cuaca untuk menanggulangi kabut asap kebakaran hutan dan lahan di Riau tahun 2014). *Jurnal Sains & Teknologi Modifikasi Cuaca* 15(2), 51-56.
- [6] Mahyudin, Soemarno and T. B. Prayogo. 2015. Analisis kualitas air dan strategi pengendalian pencemaran air Sungai Metro di Kota Kepanjen Kabupaten Malang. *Jurnal Pembangunan dan Alam Lestari* 6(2), 105-114.
- [7] Harifa, A. C., M. Solichin and T. B. Prayogo. 2017. Analisis pengaruh perubahan penutupan lahan terhadap debit sungai Sub DAS Metro dengan menggunakan program ARCSWAT. *Jurnal Teknik Pengairan* 8(1), 1-14.
- [8] Yetti, E., D. Soedharma and S. Haryadi. 2011. Evaluasi kualitas air sungai-sungai di kawasan DAS Brantas Hulu Malang dalam kaitannya dengan tata guna lahan dan

- aktivitas masyarakat di sekitarnya. *Jurnal Pengelolaan Sumberdaya Alam dan Lingkungan* 1(1), 10-15.
- [9] Akbari, F. R. 2014. Analisa perubahan tutupan lahan di Daerah Aliran Sungai dengan menggunakan klasifikasi terbimbing dan Algoritma NDVI pada Citra LANDSAT 8 (Studi Kasus: Sub Daerah Aliran Sungai Ambang Hulu, Kabupaten Malang). Department of Geomatics Engineering. Bachelor Thesis. Sepuluh Nopember Institute of Technology. Surabaya.
- [10] Rahmawati, N. N. and C. Retnaningdyah. 2015. Struktur komunitas makroinvertebrata bentos di saluran Mata Air Nyolo Desa Ngenep Kecamatan Karangploso Kabupaten Malang. *Jurnal Biotropika* 3(1), 21-26.
- [11] Rahmawati, R. and C. Retnaningdyah. 2015. Studi kelayakan kualitas air minum delapan mata air Di Kecamatan Karangploso Kabupaten Malang. *Jurnal Biotropika* 3(1), 50-54.
- [12] Habiebah, R. A. S. and C. Retnaningdyah. 2014. Evaluasi kualitas air akibat aktivitas manusia di Mata Air Sumber Awan dan Salurannya, Singosari Malang. *Jurnal Biotropika* 2(1), 40-45.
- [13] Mariantika, L. and C. Retnaningdyah. 2014. Perubahan struktur komunitas makroinvertebrata bentos akibat aktivitas manusia di saluran Mata Air Sumber Awan Kecamatan Singosari Kabupaten Malang. *Jurnal Biotropika* 2(5), 254-259.
- [14] Blume, K. K., J. C. Macedo, A. Meneguzzi, L. B. Silva, D. M. Quevedo and M. A. S. Rodrigues. 2010. Water quality assessment of the Sinos River, Southern Brazil. *Journal of Biology* 70, 1185-1193.
- [15] Anhwange, B. A., E. B. Agbaji and E. C. Gimba. 2012. Impact assessment of human activities and seasonal variation on River Benue, within Makurdi Metropolis. *Journal of Science and Technology* 2, 248254.
- [16] Yudo, S. 2010. Kondisi kualitas air Sungai Ciliwung di Wilayah DKI Jakarta ditinjau dari parameter organik, amoniak, fosfat, deterjen dan bakteri *Coli*. *Jurnal Akuakultur Indonesia* 6, 34-42.
- [17] Kustamar, B. Parianom, G. Sukowiyono and Tutik Arniati. 2010. Water source conservation based upon community's participation in Batu Town, East Java. *Dinamika Teknik Sipil* 10(2), 144-149.
- [18] Qin, H. P., Q. Su., S. T. Khu and N. Tang. 2014. Water quality changes during rapid urbanization in the Shenzhen River catchment: an integrated view of socio-economic and infrastructure development. *Sustainability Journal* 6, 7433-7451.
- [19] van den Hurk, M., E. Mastenbroek and S. Meijerink. 2014. Water safety and spatial development: an institutional comparison between the United Kingdom and the Netherlands. *Land Use Policy* 36, 416-426.
- [20] Nielsen, H. O., P. Frederiksen, H. Saarikoski, A. Ryttonen and A. B. Pedersen. 2013. How different institutional arrangements promote integrated river basin management: evidence from the Baltic Sea region. *Land Use Policy* 30, 437-445.

Supplementary 1. Sampling Location

Source: DLH of Malang District, 2016-2017

No	Location	2016	2017	Sub watershed
1	DAM Sengkaling – Brantas River, Dau District			Manten
2	Curah Dengkol River, Singosari District			Bango
3	Bodo River, Ngijo Village, Karangploso District			Bango
4	Jilu River, Pakis District		• March 7	Amprong
5	Cokro River, Jabung District	• March 14-15	• May 8	Amprong
6	Lajing River, Tumpang District	• June 15-16	• July 17	Amprong
7	Amprong River, Poncokusumo District		• September 4	Amprong
8	Brantas River, Pakisaji District			Manten
9	Brantas River, Kpendaringan, Kepanjen District			Manten
10	Ketawang River, Gondanglegi District	• May 16-17 • July 13		Manten
11	Brantas River, Kecopokan Village, Sumberpucung District			Manten
12	Sukun River, Kepanjen District			Metro
13	Brantas River, Dempok Village, Pagak District		• March 9	Manten
14	Biru River, Kromengan District		• May 10	Metro
15	Kele River, Ngajum District	• September 5-6	• July 18	Metro
16	Camplungan River, Ngajum District	• October 13	• September 5	Metro
17	Metro River, Ngajum District			Metro
18	Metro River, Pakisaji District			Metro
19	Bakalan River, Wagir District			Metro
20	Braholo River, Dau District			Metro

MANUSCRIPT SUBMISSION

FOCUS AND SCOPE

Competitiveness of destinations, products and Indonesian tourism business; Diversification of tourism products; Incentive system of business and investment in tourism; Information, promotion and communication in tourism; Tourism supporting infrastructure; Security and convenience in tourism; Tourism policy; Unique tourism community life (living culture); Local knowledge, traditions, and cultural diversity; Diversity and attractions in ecotourism; Diversity of natural attractions in ecotourism; Pluralistic diversity of ecotourism society; Diversity of ecotourism activities; Hospitality of the local resident; The quality of tourism services; Quality of HR in tourism (Standard, accreditation and competence certification); The market share of tourism and integrated marketing system; Package of tourism attraction; Development of tourism regions; Community based Eco-Tourism.

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Keywords: manuscript, English, format, 5 words maximum (Calibri 9 Left)

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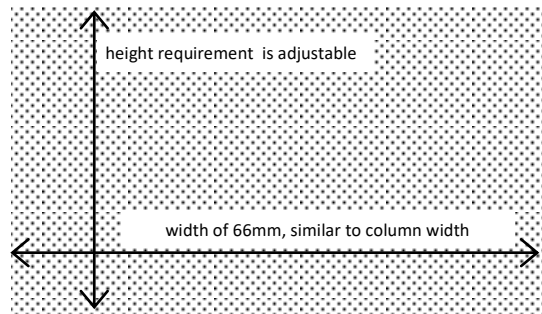


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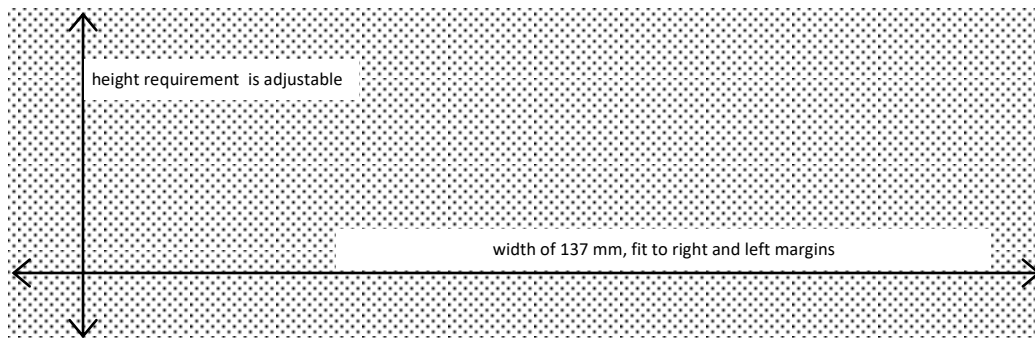


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- [4].Syafi'i, M., Hakim, L., dan Yanuwiyadi, B. 2010. Potential Analysis of Indigenous Knowledge (IK) in Ngadas Village as Tourism Attraction. pp. 217-234. In: Widodo, Y. Noviantari (eds.) Proceed-ing *Basic Science National Seminar 7* Vol.4. Universitas Brawijaya, Malang. (Article within conference proceeding)
- [5].Dean, R.G. 1990. Freak waves: A possible explanation. p. 1-65. In Torum, A., O.T. Gudmestad (eds). Water wave kinetics. CRC Press. New York. (Chapter in a Book)
- [6].Astuti, A.M. 2008. The Effect of Water Fraction of *Stellaria* sp. on the Content of TNF- α in Mice (*Mus musculus* BALB-C). Thesis. Department of Biology. University of Brawijaya. Malang. (Thesis)

CONCLUSION (Calibri 10 Bold, Left, Capslock)

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ACKNOWLEDGEMENT (Calibri 10 Bold, Left, Capslock)

This section describes gratitude to those who have helped in substance as well as financially.(Calibri 10 Justify)

REFERENCES (Calibri 10 Bold, Left, Capslock)

- [1].(Calibri 10 Justify, citation labelling by references numbering)
- [2].Vander, A., J. Sherman., D. Luciano. 2001. Human Physiology: The Mecanisms of Body Function. McGraw-Hill Higher Education. New York. (Book)
- [3].Shi, Z., M. Rifa'i, Y. Lee, K. Isobe, H. Suzuki. 2007. Importance of CD80/CD86-CD28 interaction in the recognition of target cells by CD8⁺CD122⁺ regulatory T cells. *Journal Immunology*. 124. 1:121-128. (Article in Journal)

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