

The Development of Ecotourism Based in Kondang Merak Fishermen Village, Malang, East Java

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Abstract: Fishermen village in Kondang Merak has a variety of biodiversity, there are beaches, natural scenery, a variety of marine life, and Javanese Lutung conservation forests. Based on the existing environmental potential, the area will be developed as leading tourism based on a program made by the Malang Regency Government. The development will be carried out, namely the development of ecotourism to support sustainable development that is environmentally friendly. Based on these ecotourism activities, the development of the area must fulfill the principles of sustainable development, it must be paying attention to social, economic, cultural and environmental aspects, and applying the principles of sustainable development goals (SDGs). The development of fishing villages in the area is focused on providing facilities that support ecotourism activities, such as lodging, worship facilities, culinary, souvenir sales, and tourism dock. The results of the development of the fishing village in Kondang Merak are an effort to improve the economy of the local community. In accordance with the planned development that will be carried out, it is expected that the harmony between fishermen settlements and ecotourism facilities is developed. As a manifestation of sustainable development, regional development is based on the use of local materials, renewable energy sources, and environmentally friendly management. Communities need to be empowered to respond to the existing potential without ignoring their environment so that adequate knowledge is needed through both formal and non-formal education related to this. This research uses a combined strategy, case study, and qualitative research strategies. With this strategy, it will be seen how the concept of sustainable development and sustainable development goals is implemented in the case study of the Kondang Merak Integrated Fisherman Tourism village area so that it can lift the potential of the location and improve the standard of living of the local community.

1 INTRODUCTION


Kondang Merak Fisherman Village is located in Sumberbening Village, Bantur District, Malang Regency, East Java. In this area, there are beaches, mangrove forests and the other biodiversity. This area has become a tourism object that visited by local and foreign tourists to snorkelling, camping, etc. Kondang Merak beach has the best place for snorkelling in the southern java sea, it caused by the topography and the characteristics of the beaches biodiversity.


The tourism facility in Kondang Merak fisherman village is managed by the local community, several facilities are managed by residents, including culinary area, camping ground, and several accessories

grocery stores. In this area, there are also Javanese Lutung conservation areas which are at the northern part of the beach.

The potential that is quite interesting to develop into the ecotourism Fisherman Village. In 2016 the government of Malang Regency were began developing the Kondang Merak area into the fishery centre of western Malang region. With the dock construction project and the addition of the number of fishing boats it was expected to be able to increase the marine products of Malang Regency.

Besides the dock and fish auction sites, this area has the potential to be developed as a culinary tourism area, which will also increase the income of residents. At this time there are already many seafood

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restaurants with the famous menu is satay tuna. In addition to satay tuna serving, along the shoreline are also available a variety of menus with basic ingredients of marine product including sweet tamarind octopus, fish head with spicy sauce, octopus with oyster sauce, and fish kebabs.

For this reason, a design concept that is adaptable to the environmental conditions of the region and attractive to support the development is needed to manage the Kondang Merak beach area becomes an ecotourism area that not only supports the economy of the local community but also Malang regency in general and has an attraction for excellent ecotourism object in Malang regency.

2 THEORY AND METHODS

Based on tourism regulations in the Law of the Republic of Indonesia Number. 19 year of 2009 [5] that the tourism area must have attractions, public facilities, tourism facilities, accessibility, together with interconnected communities and complete the realization of tourism.

2.1 Regulation of Tourism Development

According to Law No. 01 of 2011 [6], housing and settlement areas are an integrated system consisting of guidance, housing administration, administration of residential areas, maintenance and repair, prevention and improvement of the quality of slums and settlements, land supply, funding and financing systems, and also the role of the community.

1. Coastal Community Housing and Settlements
 - a. Coastal Building Forms
 - 1) The shape of houses on stilts is generally in an area on the water, both on the boundary space of the coast and land
 - 2) The form of ordinary houses is generally located in a puddle-free area.
 - b. Building status and Land Ownership in Coastal Area
 - 1) State Land Status on water or land.
 - 2) Land ownership from generation to generation.
 - 3) Build house patterns in family groups.

- 4) Land tenure by traditional coastal reclamation.

The requirements for the development of coastal housing and settlements [10,11,12,13,14,15,16,] are:

- a. The distance between buildings that considers each house to get good lighting and air circulation, safe from infectious diseases, and easy implementation of the provision of environmental infrastructure.
- b. The distance between buildings and roads that can support smooth and safe traffic, reduce air pollution and dirty noises, and the availability of playgrounds.
- c. The distance between the building and the beach that can preserve the coast, can be filled with green lines to reduce wind power, and overcome coastal erosion.

2.2 Ecotourism Theory

Ecotourism is defined as the concept of sustainable tourism development that aims to support efforts to preserve the environment (natural and cultural) and increase community participation in management, thus providing economic benefits for the local community [1,8,9].

2.2.1 Ecotourism Criteria

According to the Ministry of Culture and Tourism of the Republic of Indonesia (2009) [2,15] ecotourism has many full definitions of principles in tourism whose activities refer to 4 (four) important elements:

1. Provide experience and education for tourists to increase understanding and appreciation of the tourist destinations they visit. Education is provided through an understanding of the importance of environmental preservation while the experience is provided through creative tourism activities accompanied by excellent service;
2. Minimizing the negative impacts that can damage the environmental and cultural characteristics of the area visited;
3. Involve the community in management and implementation; and
4. Provide economic benefits, especially for the local community. Therefore, ecotourism activities must be profitable.

2.2.2 Principle of Ecotourism

The principle of ecotourism is a variety of principles that govern to unite environmental

conservation, community development, and sustainable tourism. This means that those who implement, participate in ecotourism must implement the criteria and principles. The principles of ecotourism are as follows: 1. Minimizing physical, social, behavioural, psychological impacts; 2. Building environmental awareness, culture, and respect; 3. Providing positive experiences for visitors and hosts; 3. Providing direct financial benefits for conservation or environmental preservation; 4. Generate financial benefits for the local community, private industry; 5. Provide a memorable interpretive experience for visitors to increase sensitivity to the political, environmental, the social climate of the tourist destination; 6. Build, operate facilities or infrastructure by minimizing environmental impacts; 7. Recognize the spiritual belief rights of indigenous communities and empower them.

2.3 Sustainable Development Goals Criteria

According the United Nation Sustainable development goals there are seventeen criteria that must be fulfilled for a good sustainable development of ecotourism object. In this study we will measure the index of fulfilled SDGs criteria [13].

The United Nation Criteria of sustainable development goals that will measure in this study is seventeen criteria that are : 1. No Poverty; 2. Zero Hunger; 3. Good health and wellbeing; 4. Quality education; 5. Gender Equality; 6. Clean water and sanitation; 7. Affordable and clean energy; 8. Decent work and economic growth; 9. Industries, Innovation, and Infrastructure; 10. Reduced Inequalities; 11. Sustainable cities and communities; 12. Responsible consumption and Production; 13. Climate Action; 14. Life below water; 15. Life on land; 16. Peace, Justice, and strong institution; and 17. Partnership for the goals.

2.3.1 Methods and Data

This study use case study and qualitative methodology to analyse the research problem. SDGs criteria and the principal of sustainable development used as the main theory to answer the problem. Government regulation used too as a guide and adjust the development the area into the leading ecotourism destination.

2.3.2 Data Type

The field of data observation in the study area consists of: 1. Physical Information Data Includes various inputs related to the physical condition of the object of study (such as natural conditions, environmental infrastructure, public facilities, housing conditions of residents, residential ownership status, landscaping); 2. Economic Data Information: Covers the economic potential of the population (such as skills, business opportunities, economic level capabilities of fishermen, residents' daily work, future prospects, people's needs); and 3. Information on Social and Cultural Data: Includes habitual populations related to the behaviour and culture of fishing communities by taking into account the existence of the environment (such as socialization of citizenship, kinship, and similarity of local origin, trust in community relations, environmental preservation). Knowing certain norms that exist in the lives of fishermen, which can encourage positive and negative groups.

2.3.3 Data Analysis

The analysis phase utilizes a variety of field data literature, obtained from research observations, and supports all data. The next step is done by grouping all data according to its type to facilitate through discussion. The data analysis step in the research area consists of: 1. Analysis of physical development aims: Seeing the potential and limitations of existing data in the field, to measure the extent to which the region can be corrected in order. Plan some interrelation strategies, so those goals can be achieved without the potential for a destructive and defensible environment; 2. Socio-cultural and economic analysis of the population, aiming: Avoiding negative impacts due to regional development. Formulate a development policy community; and 3. SDGs achievement measurement of existing condition

3 RESULT AND ANALYSIS

The location of the study area is located on the South Coast of the Java island precisely in Sumberbening village, Bantur district, Malang Regency. There is a fishermen's housing in that location with physical condition which is less fulfilling as a decent and healthy occupancy. This assessment is based on the lack of facilities and infrastructure environment. This location inhabited by 26 families with lower middle social class community. Based on their low-income

background, they are very easy to blend in. The togetherness occurs when they go to fishing on the fishing season.

3.1 Location and Infrastructure



Figure 1. Main development area mapping (A); Site boundaries (B).

The location of the village is in the administrative area of Sumberbening Village, Bantur District, Malang Regency. Here are the site specifications:

1. Geographic : Kondang Merak bay coastal area
2. Siting Area : + 17,748 m²
3. Site topography : Altitude of the lowest ground level of 0 m and the highest is 6 meters above sea level relative contour conditions
4. Climate : The climate in the location is classified as tropical humid beach.

Based on these boundaries, the developed area includes the settlement area and boat mooring area. As for the coastal tourism area, it is used as a supporting area because the fishermen tourist village development area is only in the area that falls within the boundaries of the site.

Accessibility to the tourism area becomes one of the main elements for the development of the tourism area, in the existing conditions the

conditions of accessibility to this area are still not easily accessible, due to the following problems:

1. The main access from the city needs to be improved with JLS (Jalan Lintas Selatan) facilities and supporting facilities such as lighting and drainage, the JLS project has not been completed until the construction of road supporting infrastructure such as: PJU (*Penerangan Jalan Umum*), closed drainage of the highway, and greening the corridor road area. The following here are the JLS cross-section:

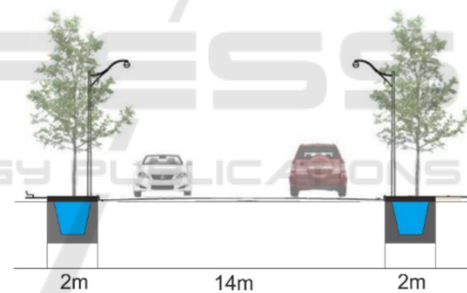


Figure 2. Cross-section of the JLS

JLS access only stops at the intersection around the Balekambang beach so that the continued access to the Kondang Merak coastline continues through macadam routes, because the JLS project has not yet reached this area, and is still waiting for the next fiscal year, so accelerating the construction of the JLS next stage is needed.

2. After JLS continued access, the access to Kondang Merak Beach must pass through a narrow macadam route to the south, here are the existing cross-sections and development plans:

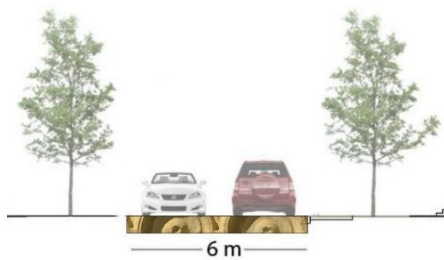


Figure 3. Cross-section of Makadam Road to Kondang Merak

3.2 Signage

Signage to the Kondang Merak tourist area is very limited and very lacking, the following is the condition of the existing signage towards the kondang merak area:



Figure 4. Signage existing to the Kondang Merak

3.3 Zoning and Land Allocation

At present zoning and land allotment in the coastal area of Kondang Merak do not yet have clear zoning, here are the development plans of Kondang Merak ecotourism fisherman village:

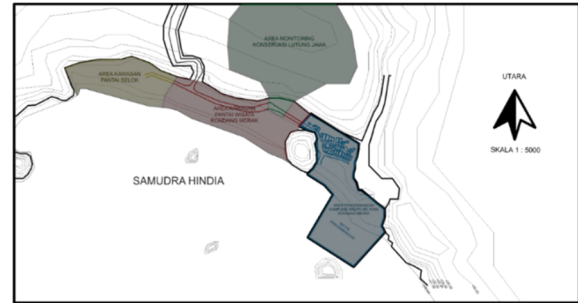


Figure 5. Zoning division of Development Areas

3.4 Potential Attractions

The area of Kondang Merak has several potentials that can be developed into tourist attractions, such as white sand on the beach, the richness of coral reefs, the beauty of the ocean panorama, the beauty of the sunset panorama, the presence of coral which is an interesting point on the shoreline and the Javanese Lutung conservation.

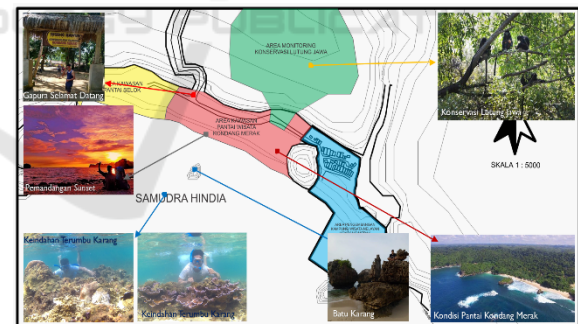


Figure 6. Potential Attractions in Kondang Merak

3.5 Environmental Conditions in the Kondang Merak Fishermen Village

Community in this location still use firewood for cooking, because in the surrounding area there are many sources of firewood energy, besides there are also those who have used subsidized gas. For the electrical energy the communities using solar cells because there is no access to electricity from PLN to that location. Water is obtained from water sources

around the location and reserve in the water tank and used together.

Community of Kondang Merak fisherman village builds the buildings using reef rock material as the foundation of the building so that they utilize local materials. Otherwise, they producing bricks as wall materials for houses and buildings. The building design is quite climate-responsive with natural openings, but the orientation of the building faces south because it makes the beach the main orientation, so that the longest side of the building faces east-west, it caused by the characteristic of coastline community that use sea as the main orientation of everything.

The sanitation system in the fishing village area is still lacking. This is indicated by still using public toilets as accommodation for daily needs, but some houses already have private toilets using a septic tank so that they do not pollute the surrounding environment. Many buildings use renewable resources such as the use of solar energy for electricity, wood for cooking, materials from the surrounding environment.



Figure 7. Some fishing houses in Kondang Merak use brick material to improve climate resilience

Based on observations, there have been many improvements in the resilience of dwellings with some houses being renovated using more durable

materials. With close enough housing conditions, the potential for fire hazards is large, but many also use flammable materials such as woven bamboo and wooden boards in the area of the house. Too close to the house also makes the morning sunless access to the area in the house.

3.6 Social Conditions in the Village of Kondang Merak Fishermen

The behaviour of social activity in the communities are becomes active in public activities carried out such as cooperation to build a hall, develop joint tourism businesses that are jointly managed. There are gates in the village area that make the impression of the fisherman village more vocal and there are also common areas for knitting nets and anchoring the boat so that the impression of the fishing village is quite thick. The absence of the jetty has also had a positive impact on residents so that each will anchor the boat to the beach they will work together to push the boat to the beach

There are playground facilities for children that are quite simple near the fishing halls, there is a library with reading books according to age, there is a health post but there is no team of health experts who always stand by at the location. Lack of infrastructure access to the nearest public facility (the condition of the road from the location to the arterial road is still in the form of macadam and often inundation when it rains so that the access is slightly isolated). And in the region, there is no information and utility system in the area which is well organized and systematic.





Figure 8. Gate to the Fishermen's Village (A); Library facilities (B)

3.7 Cultural Conditions in the Kondang Merak Fishermen Village

The design of fisherman settlements in the location is quite responsive to coastal culture and coastal communities, making the beach as the main orientation of settlement, and has a terrace area as a multifunctional communal space, both socio-cultural and economic.

Typical forms of occupancy are relatively the same, namely the shape of a gable roof with a rooftop terrace, but characteristically many houses already use certain ornaments as the identity of the occupancy occupied, the use of diverse colours also shows that residents at the location have an impression of beauty that they want to display on their dwelling.



Figure 9. The types of houses in the Fishermen's Village are relatively the same

Public facilities for culture, affordable entertainment are still minimum, but there are already multifunctional fishing halls that are used by residents to learn (read, play, and socialize). At this location, it is still a discourse of the government to be developed as one of the regency's economic resource areas with the construction of a dock and a TPI for the western Malang region. However, there is still no transfer program to a more suitable location, according to a source we interviewed for the construction of the JLS, which should have covered the access area to Kondang Merak which has not yet been completed

3.8 Economic Condition in Kondang Merak Fishermen Village

Social groups in the fishing village area are relatively equal in that they work as fishermen with the same average income so there is no social disparity, but there are also some residents who just stop by to go to sea but have shelter in other places that are more affordable by public access. Until now, housing on the site is only inhabited by the lower middle classes community.

The location of the residence is very supportive for the occupation profession, namely fishermen, where the population's economic area is right in front of the residential area. In collaboration with the government, residents, and PT Perhutani develop the area around the fisherman village Kondang Merak as a tourist area that is also able to raise the economic level of the surrounding residents. So many residents also make stalls, diving rental places, toilet facilities for tourists who visit.

But until now the land occupied by residents is Perhutani's land because in that area there is also a Javanese Lutung conservation area so residents in the area are still riding on Perhutani land and do not yet have the legality of ownership rights, only land use rights. While for the management and maintenance of residential areas managed by residents independently. Then to increase the resilience of many residents who have replaced building materials from semi-permanent materials to permanent materials such as concrete blocks.

Table 1. Achievement Score

No	Goals	Achievement					Existing condition
		SD	D	N	A	SA	
1	No Poverty						Regional Minimum Salary of Malang Regency Rp. 2,574,807.22 fishermen's income in the fish season can reach Rp.10,000,000.00 at one time at sea, but can go down depending on natural conditions, so the average annual income is still below the Regional Minimum Salary.
2	Zero hunger						Food fulfillment of the location of the village is quite good because some residents also have home town in the agricultural village area
3	Good Health and Well-being						In the case of the health of the citizens, it is now sufficient to meet the health requirements because they have their own health posts but do not yet have a stand-by health worker
4	Quality Education						Access The nearest school is in the center of the village of clear sources about 12 Km from the location
5	Gender Equality						Gender equality in the community is quite good because for women at the location also work opening food stalls
6	Clean water and sanitation						The availability of clean water is quite good because there has been a clean water network improvement program, but not all residents have private toilets
7	Affordable and clean energy						The use of solar cells is enough to help residents in providing electricity, even though the current PLN network still not reaches the area
8	Decent work and economic growth						Need to improve facilities in the form of docks for ships and fish auction places to better support the economy of the citizens.
9	Industry, innovation, and infrastructure						Lack of infrastructure in the form of access to locations that are still difficult and also PJU facilities and regional utilities are still minimal, but innovatively many residents have been able to realize innovation and the tourism industry.
10	Reduced inequalities						The social gap in the location is not visible so it is quite harmonious and mutual cooperation
11	Sustainable cities and communities						The community works together in developing their living areas and collaborating in managing the potential of tourism areas in their homes
12	Responsible consumption and production						With a government program that likes to eat fish also increases the consumption and productivity of local fishermen in the location of the study object, the average catch of local fishermen besides being sold fresh is also sold in the tourist stalls.
13	Climate Action						The community didn't do the active or passive climate action, there is no attempt to deal with climate change
14	Life Below water						Fishermen on-site use traditional fishing systems, namely using conventional nets and fishing rods so that they are environmentally friendly, while also using crab and lobster traps from renewable materials to preserve the environment.
15	Life on Land						there is a Javanese Lutung conservation area around the location which is guarded by residents and conserved so that it is very supportive for the preservation of terrestrial ecosystems, in the location there is also no land clearing for tourist areas so that the nature around the location is very awake, the estuaries around the location are also clean and planted with mangroves
16	Peace justice and strong institutions						The existence of a group of fishermen makes the famous fishing community of Kondang Merak very harmonious and creative and well organized
17	Partnerships for the goals						Partnership management of tourism areas between citizens and Perhutani make economic growth and management of the area to be good and quite well monitored.

The minimum mean score of achievement the goals was 51, according to the analysis above in Kondang Merak fisherman village has achievement score 55, it is above the minimum score of the achievement.

3.9 Economic Condition in Kondang Merak Fishermen Village

According to the analysis above we know that some criteria and goals is didn't fulfil so we need improve the development of fisherman village as an ecotourism area.

3.9.1 The Concept of Ecotourism Development Activities

There are 4 zone of existing condition in Kondang Merak fisherman village, that are: 1. Javanese Lutung conservation area; 2. Tourism exploration Area; 3. Community Economic area; and 4. Community residential Area.

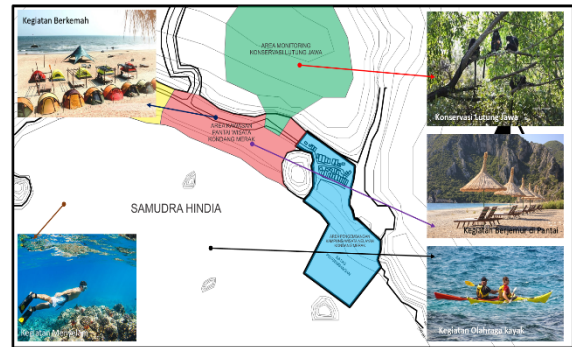


Figure 10. Ecotourism Development Plan

3.9. The Concept of Facilities and Infrastructure Development

Some facilities on this area must be added to improve the quality and service of ecotourism in this location. Street infrastructure is the main component that must be develop to make it easy to reach the location. Otherwise, the signage and the entrance area must build to give the tourist information about the location of ecotourism area

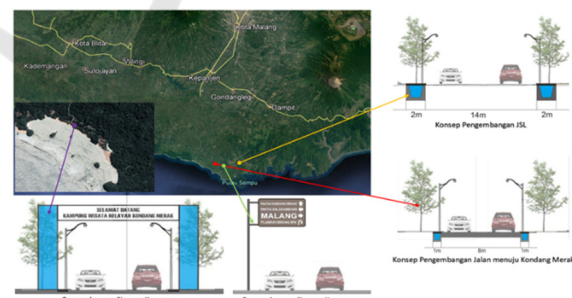


Figure 11. Development Plan for Signage and Infrastructure

Some main facilities must be developed to improve the economic and social aspect in this location, that are: 1. Tourism information Centre; 2. Culinary facilities and restaurant; 3. Hospitality facilities; 4. Fish Auction Facilities; 5. Cold Storage Facilities; 6. Fishery and Tourism Boat Dock.



Figure 12. Facility and Infrastructure Development Plan

3.9.3 The Concept of Facilities and Infrastructure Development

According to the concept of ecotourism development, in the case study of Kondang Merang fisherman village the development should be Implemented the main concept of sustainable ecotourism, that are:

- 1) The management of ecotourism activities manage by Local communities form organizations or institutions with financial support from local governments and private sector with training and assistance (community-based participation values).
- 2) The principle of local ownership (management and ownership by the community) is applied to ecotourism facilities and infrastructure (boat rental accommodation, restaurants, camping, and Javanese Lutung education tourism).
- 3) Homestay is a choice for accommodation and development of local people's creativity in making souvenirs by processing sea products and other handicrafts (economic and social value).
- 4) Tour guides from local communities who know about the location and have gone through training.
- 5) Pioneering (planning, development), management, and maintenance of tourist objects is the responsibility of the local community (as additional income that supports the livelihood as a fisherman, especially if he does not go to sea).

The concept of developing a fishing village area represents sustainable development that takes into account the elements of concern, responsibility, and

commitment to the authenticity and sustainability of the environment and the welfare of the local community. And as an effort to maximize and at the same time preserve the potential of natural resources and culture of the local community to be used as a source of sustainable income.

4 CONCLUSIONS

As for the description above, it can be concluded as follows:

- 1) Village areas and potential areas in the Kondang Merak Fishermen village have the potential to develop of ecotourism. the diversity of natural flora and fauna has the potential to be developed as sustainable ecotourism. Community-based development must be implemented to this area.
- 2) The condition of the asphalt road leading to the Kondang Merak Fishermen village that passes through the Jalan Lintas Selatan (JLS) only stops at the intersection of Balekembang Beach. Furthermore, to reach the area the road conditions are only in the form of macadam, thus making the travel time quite long, besides the limited availability of lighting and direction markers along the road. There are low-quality rental houses, mosques, and toilets. Other supporting facilities must be built to improve the quality and service in the location such as tourism services, trade services, and supported facilities that improve ecotourism activities that will be develop.
- 3) To improve existing human resources, there needs to be good and broad knowledge. So education is needed both formally and informally, with existing knowledge can help the community to improving the social, economic, and cultural conditions to protecting their environment.
- 4) Directions for the development of ecotourism-based housing in the Kondang Merak Fishermen village are as follows: Housing is developed into a homestay, community involvement in managing ecotourism activities, directions for developing accessibility in the form of improved road infrastructure and other traffic devices and supporting directives for

- infrastructure development based on ecotourism.
- 5) It is necessary to increase cooperation between Government, the private sector, and the community in the development of ecotourism in Kondang Merak. The potential of the existing environment is very interesting to be developed into leading tourism in East Java, especially in Malang Regency.

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