








The Potential of Tourism in Pahawang Island, Lampung Province, Indonesia

Indra Gumay Febryano* , Putri Wahyuni , Hari Kaskoyo , Abdullah Aman Damai , Henky Mayaguezz 

Department of Coastal and Marine Area Management, Universitas Lampung, 35145 Bandar Lampung, Indonesia

* Correspondence: Indra Gumay Febryano (indra.gumay@fp.unila.ac.id)

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Abstract: The natural resources that exist on this small island have the potential as a tourism destination. The purpose of this research is to be able to develop the potential of community-based tourism. The method used to collect data is observation and in-depth interviews with key figures, then the data is analyzed descriptively and analysis of component 4(A) namely attraction, accessibility, amenity, and ancillary of Tourist Attractions. The results identified are land use patterns, tourist attractions include beach tourism, mangrove tourism, underwater tourism (snorkelling), special interest tours for langurs, cycling tours (around the island), climbing tours, and religious tourism. Existing accessibility includes roads, boats, and piers. The amenities include places of worship, public toilets, food stalls, lodging, and snorkeling equipment rental services. Additional or ancillary facilities that exist are an information center located at the village office and a tour guide. The need for human resource training is also very much needed to shape community-based tourism to be much better.

Keywords: Small Island; Natural resources; Tourism; Tourism potential; Tourism facilities

1. Introduction

A simple definition small island is a visible land, where the island is small, the boundaries are visible, and it is seen that all objects in it can be measured [1]. Small island based on the Law of the Republic of Indonesia number 27 of 2007 that the definition of a small island is an island that has an area smaller than or equal to 2,000 km² (two thousand square kilometers) and its ecosystem unity. In addition, this rule also regulates the improvement of the welfare of small island communities on available natural resources. Small islands are also characterized as having limited resources and territory [2]. Although small islands have limited resources, they can still be put to good use [3]. Coastal areas of small islands have potential resources that can be seen in terms of quantity and quality [4].

In general, natural resources in small island areas consist of natural resources that can be recovered (renewable resources), non-renewable resources (non-renewable resources), and coastal and marine environmental services (environmental services). Coastal and marine environmental services are tourism, and non-recoverable resources include oil and gas, iron ore, sand, tin, bauxite, and other minerals and mining materials. Besides that, this area also has fishery potential and tourism potential [5]. That resources can be recovered, consisting of various fish, plankton, benthos, mollusks, marine mammals, seaweed, seagrass, coral reefs, crustaceans, and mangroves [6]. Reversible resources, such as mangroves, are usually susceptible to change or damage impacting some of the habitats on small islands [7]. One of the damages to mangroves is plastic waste [8]. Regenerating mangroves on small islands is urgently needed to defend the island from its vulnerability [9]. In this case, the need for zoning planning starting from marine spatial planning and land spatial planning is very important in the management of small islands. This will affect natural resources, even those that will be managed as tourist attractions [10].

Tourism on small islands is slightly different from tourism in mainland areas in general, this is because the geographical conditions of the islands have distinctive characteristics [3]. These characteristics belong to the potential which can be taken from the beauty and authenticity of the environment as tourism such as diving,

snorkeling, surfing, fishing, and others [11]. These things can be used for tourism development as an economic improvement for island communities [12]. From an economic point of view, tourism activities can contribute to regional revenues sourced from taxes, parking fees, and tickets or can bring in foreign exchange from visiting foreign tourists [13, 14]. Tourism management that is allegedly not good will make ecosystem damage/crisis on an island even more threatened. The low knowledge of tourism actors about ecosystems in carrying out tourism activities has an impact on the environment [9]. The environmental impacts due to tourism are felt, namely the indiscriminate disposal of waste [15], causing a decrease in the quality of sea waters [16], damage to coral reefs and a decrease in the area of coral cover [17]. Other impacts also occur, such as damaged shorelines, loss of traditional coastal land use [18], disruption of coastal vegetation that is open for tourism needs [19], resulting in changes in land use [20]. To prevent this, actually it cannot be separated from the implementation of policies implemented on small islands so that island management runs well [21]. In this case, the concept of tourism activities is needed, which apart from helping local communities, can make small islands self-sufficient and sustainable.

One good tourism concept that can help local communities is community-based tourism. This tour is expected to optimize community participation, thus increasing tourist satisfaction and the welfare of the local community [22]. Community Based Tourism or commonly referred to as Community Based Tourism (CBT) is a tourism model that involves local communities by providing opportunities to manage and develop tourism, either directly or indirectly, which has links with the tourism industry or business, so that the distribution of benefits is fair to society. in rural small islands [23]. The purpose of this research is to identify the potential of tourism in Pahawang Island, Lampung Province, Indonesia.

2. Methodology

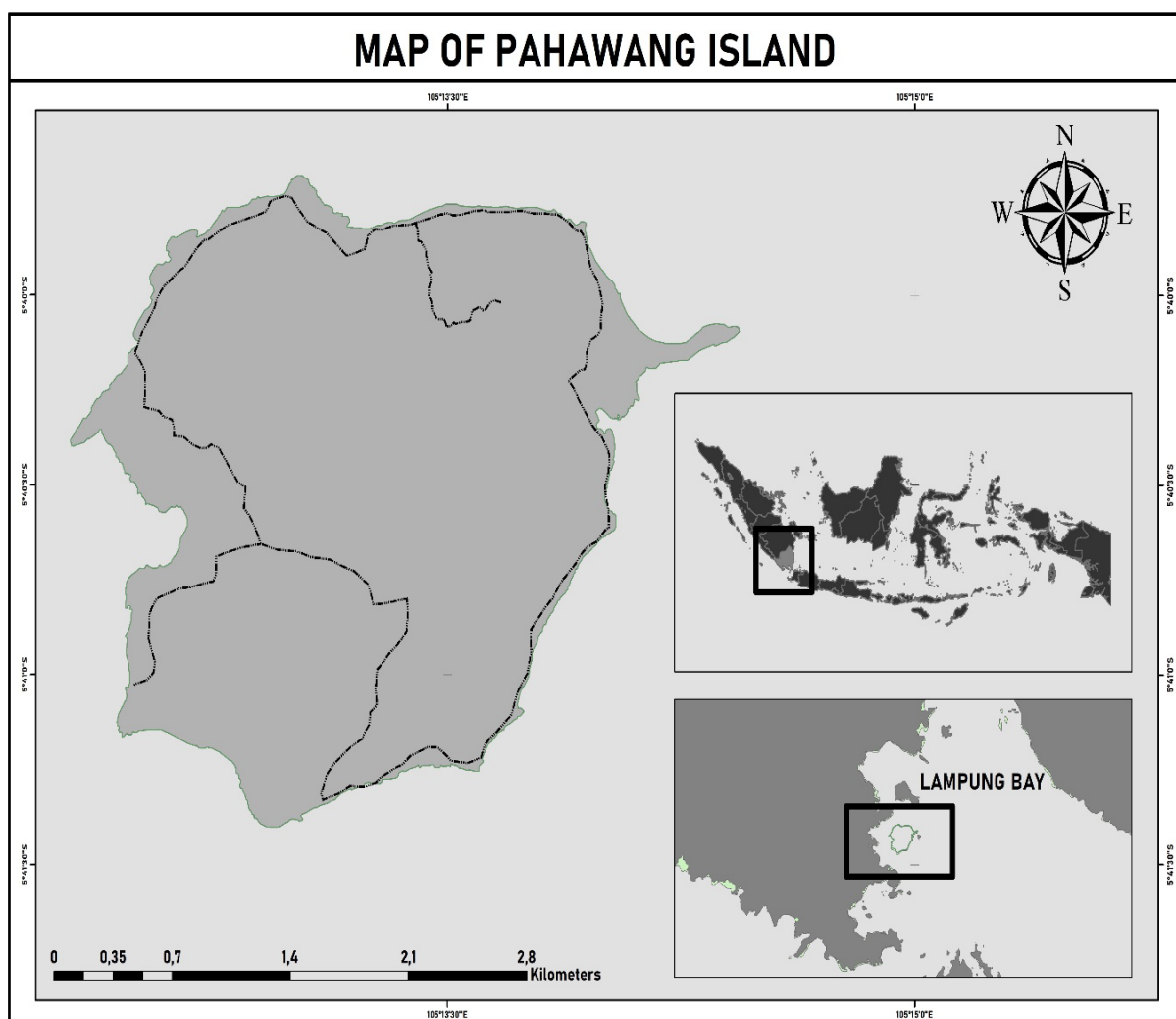


Figure 1. Research locations

The research was conducted on Pahawang Island, Lampung Province, Indonesia from October 2021 to February 2022 (Figure 1). The research object is a small island with an area of 1,084 ha. The method used to collect data is observation and in-depth interviews. The sample of interview respondents was determined using purposive sampling, namely key informant/traditional leaders who come from local communities and have lived for a long time. The data collected includes data on land use patterns, tourism potential, and tourism support facilities at the research location. The data analysis used is descriptive and 4A analysis by Cooper et al. [24], namely A1 (Attraction or Attractions), A2 (Accessibility or Accessibility), A3 (Amenities or Amenities), and A4 (Ancillary or Additional Facilities) for Tourism Attraction Objects which refers to Law Number 10 Year 2009 concerning Tourism.

3. Results

3.1 General Condition of Research Site

Pahawang Island is divided into two, namely Pahawang Besar and Pahawang Kecil which has an area of about 1,084 ha. Administratively, the area of settlement on this island is about 15 ha, and is divided into six hamlets, namely Suak Buah, Penggetahan, Jeralangan, Kalangan, Pahawang, and Cukuh Nyai. Geographically, it is close to Punduh Pidada Bay with lines 5°41'53" – 5°39'02" south latitude and 105°11'44" - 105°14'59" east longitude [25]. Pahawang Island has natural resources of agriculture, plantation, and forestry. This island has a tropical rainy climate with rainfall between 2,264 mm to 2,868 mm [26].

Characteristics of land cover on Pahawang Island include settlements, agroforestry, mangrove forests, community-protected forests, and ponds. The area of agroforestry land cover is 830.86 ha, with plant compositions including cocoa, coconut, clove, durian, rambutan, hamlet, breadfruit, petai, mango, areca nut, jengkol, and sugar palm. The area of mangrove forest is 141.94 ha (Village Administration Book). This island is a fairly diverse and productive area with several resources such as coral reefs, seagrass, fisheries, and mangrove forests [27], the mangrove ecosystem on this island is quite extensive [28]. The research said that the existence of mangrove forests is an important thing as biodiversity, as well as island defense or existing green belts [29].

Other potential resources are animals, that langurs were found on Pahawang Island. The presence of fish is also abundant around this island which is indicated by the good condition of coral reefs [30]. Tourism development is also being carried out on this island [31]. This island is being developed for sustainable tourism related to the concept of more educative tourism planning [32].

3.2 Land Use Pattern

Before getting to know the pattern of land use, it is better to know the slope or contour of Pahawang Island (Figure 2). This island's slope classification is grouped into six, namely the road network, flat, sloping, slightly steep, steep, and very steep. The following can be seen starting from the road network that stretches around the island marked with dotted lines. The condition of the island's contours with flat land conditions, marked in green with an area of 283.12 ha. The condition of the sloping contour of the island, marked by a lighter green color, covers an area of 170.68 ha. The island's steep slopes are marked in yellow, with an area of 162,279 ha. Mainland islands with steep contours are marked in orange, with an area of 77.30 ha. The condition of the island's contours with very steep conditions is marked in red which has an area of 26.16 ha. So, the total is land slope in Pahawang Island is ±725.51 ha.

The total area of the slope or contour that is mostly occupied by the community is the slope or contour class which is categorized as flat. These locations are usually found in local community settlements, and also stand several lodging places such as cottages or villas. The location is also scattered with several agroforestry plants and ponds. This will include a more detailed description of land use or land use patterns on Pahawang Island.

The pattern of land use or land use is a type of spatial use that is common in small islands, one of which is Pahawang Island. The utilization of territorial space on this island is usually useful for maintaining the stability of the island from the risk of vulnerability. Another benefit is that it is useful for the community to survive. The land use pattern consists of several components that form an important unit on this island. The existing land use or use patterns are classified into five parts, namely agroforestry, mangroves, ponds, settlements, and forests that are protected by the community (Figure 3).

The pattern of land use or use of agroforestry is the largest land use. This area is a source of community livelihood; besides that, it is also a source of food security for the local community. The area of the agroforestry class when viewed from the digitization results reached 552.4 ha. In general, when viewed in the field, people prefer planting patterns in the form of yards, mixed gardens, and forestry plants. MPTS (Multi-Purpose Tree Species) is also often found in agroforestry cropping patterns. In general, the species composition that can be found includes woody plant species and non-wood species. Other types of plants consist of vegetables, fruits, tubers, and seeds.

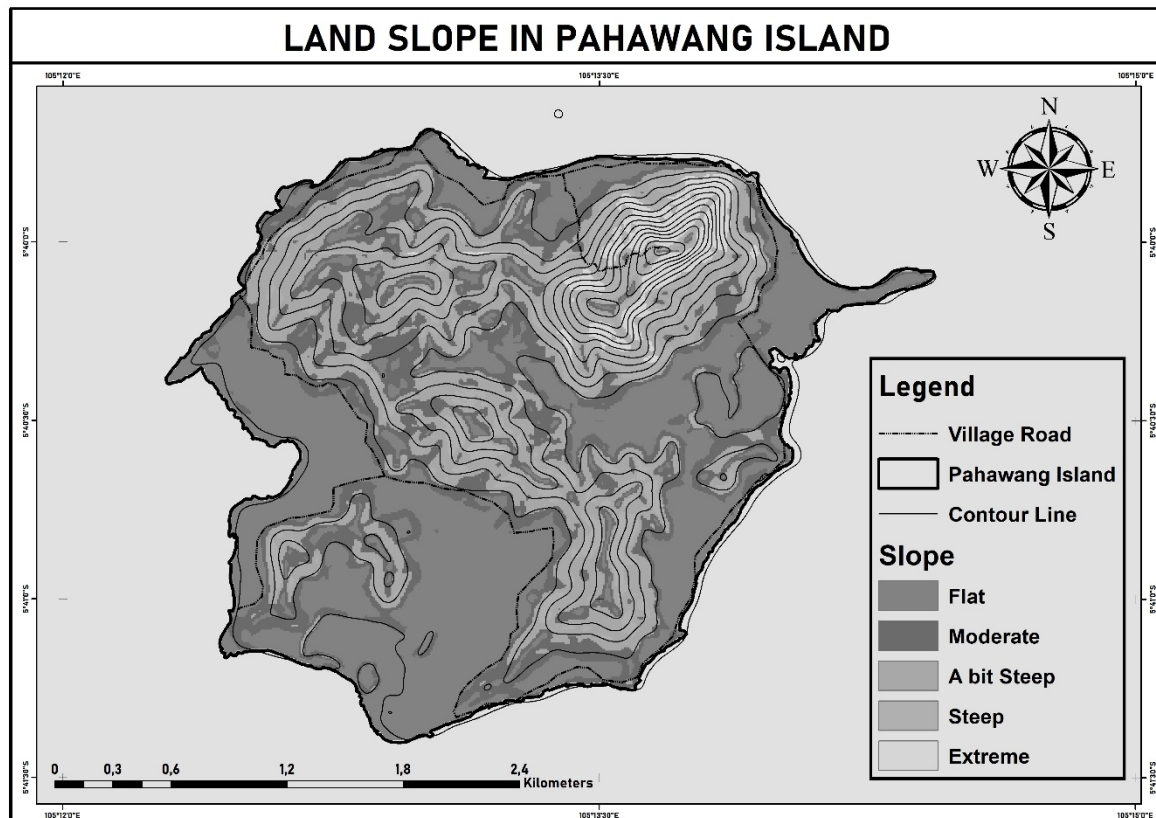


Figure 2. Map of the slopes of Pahawang Island

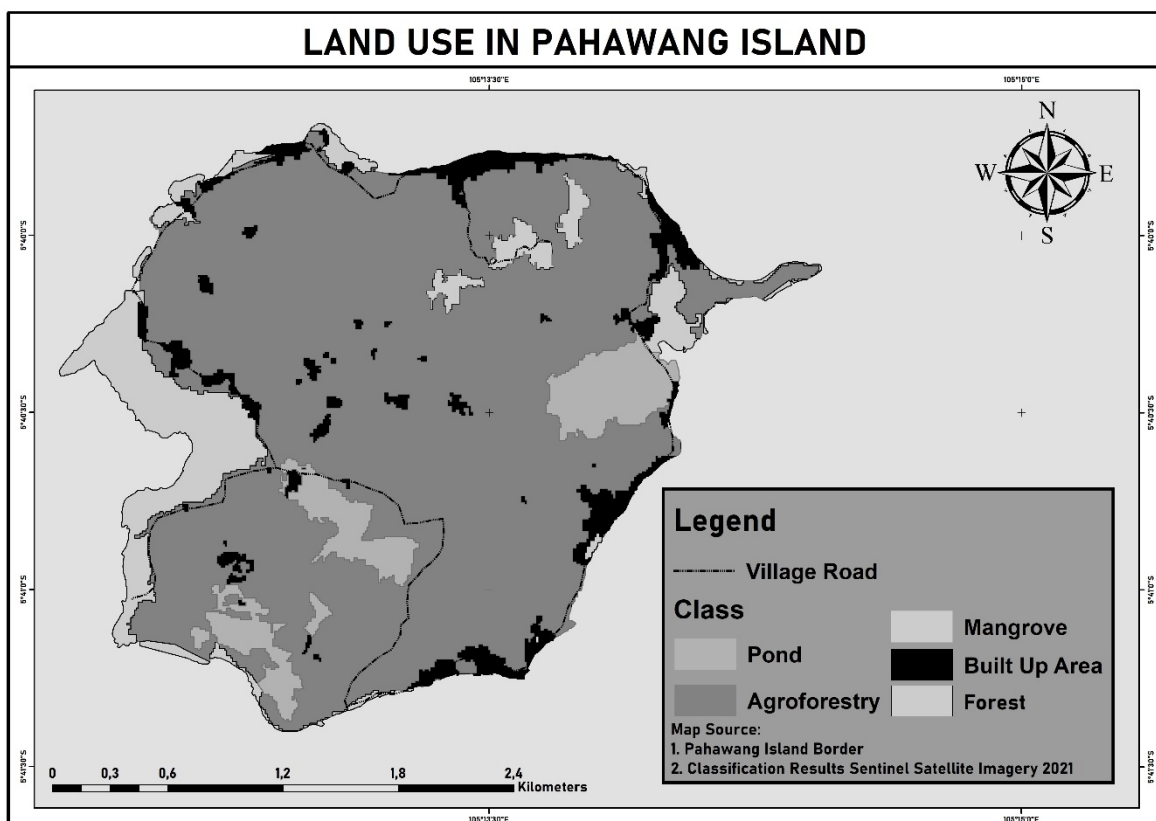


Figure 3. Map of land use patterns on Pahawang Island

Types of woody plants that can be found on Pahawang Island include kapok tree (*Ceiba pentandra*), durian (*Durio zibethinus*), jengkol (*Pithecellobium lobatum*), mangga (*Mangifera indica*), bayur (*Pterospermum javanicum*), hibiscus mountain (*Hibiscus similis*), petai (*Parkia speciosa*), and others. Types of non-timber plants that are often found include cocoa (*Theobroma cacao*), coconut (*Cocos nucifera*), banana (*Musa sp.*), and others. Qurniati et al. [33] said that to support the development of agroforestry, social capital needs to be increased through the development of good bridging networks so that it will affect community welfare and sustainable forest management. That agroforestry is a combined cropping pattern between agricultural and forestry crops in the same area so that it functions as a profitable crop [34, 35].

Another land use pattern that is also very important on this island is mangroves. The existence of mangroves on Pahawang Island acts as a green belt in defending the island from several vulnerability risks. The existing mangrove area according to map digitization is 66.49 ha, while according to village data it is 141.94 ha. The mangroves on this island consist of a utilization zone, a buffer zone, and a core zone. The types of mangroves that exist include mangrove associations, aviccenia, bruguiera, and rhizophora. Each has its function and is beneficial for life on this island. The benefits of mangroves on Pahawang Island in addition to being a green belt, mangroves are highly sought after in terms of filtering waste in the sea. Become an ecosystem or habitat for several existing animals such as long-tailed monkeys, langurs, snakes, monitor lizards, and several types of birds. In addition, it is a place for feeding animals, a place for spawning fish, a place for small fish to forage for food, or other types of marine animals. Mangroves also provide benefits to the surrounding community, such as several types of mangroves can be used as food, such as syrup from mangrove fruit, mangrove lunkhead, and dead mangrove twigs taken to be used as firewood.

Over time, the mangroves on Pahawang Island have changed for several reasons. Starting from a massive expansion of tourist areas and ponds. The pond on this island is one of the land use patterns that is used as a place for the community to increase their income. The total area of the existing ponds is 5.20% of the island or ± 54 ha. Initially, this pond was produced around the 2010s and then due to several reasons, the pond began to stop producing. Active pond production is only about 3 years, this problem shows fish production is not good, so harvesting activities decline and go bankrupt. Currently, only a puddle of water remains in the middle of the island, and its condition is left as it is. In article said preserving the mangrove forest ecosystem, an active role for local governments is needed in preserving the mangrove forest [36].

The most important land use pattern on Pahawang Island is a settlement. Settlement is a place where people live, a place to interact with each other, and a resting place for every family on this island. The area of community settlement according to map digitization is 47.16 ha, while according to village data it is 27.25 ha. most types of houses are permanent. Community settlements here are in addition to houses owned by the community, places that include schools, food stalls, homestays, mosques, and village offices. There are six hamlets on this island, namely Suak Buah, Penggetahan, Jeralangan, Kalangan, Pahawang, and Cukuh Nyai. In addition, other land-use patterns are forests that are protected by the community.

The forest protected by the Pahawang Island community has a very important role. Starting from the water source used by the community, and becoming a defense area against the vulnerability of the island. The area of forest protected by the community is ± 6 ha, of which 10.5 ha is identified by map digitization. This forest was agreed to be protected by several communities for several reasons. The agreement made is a deliberation agreement between the community and is not written. Forests with an area of ± 6 ha are forests that are not allowed to be cleared by the community. The condition of the forest is still pure natural forest, and it is located on the Sacred Mountain. The composition of this forest type is shrubs and several types of trees that grow wild. The surface conditions are a little rocky and steep because the location of the forest is on the top of a mountain. Besides the function of the forest is the reason this forest is protected, the existence of a tomb on the top of a mountain and related to mystical things is also one of the factors that the forest is not opened.

3.3 Tourism Potential

Table 1. Identification of 4A related tourist attractions on Pahawang Island

No.	Identification of 4 ^o	
1	Attraction	Beach tourism, mangrove tourism, underwater tourism (snorkelling), special interest langur tourism, bicycle tours, climbing tours, and religious tourism
2	Accessibility	Roads, dock, and ships
3	Amenity	Places of worship, public toilets, stalls/canteens, snorkeling equipment rental services, and lodging
4	Ancillary	Information center, guide, WIFI network, and electricity

To find out the tourism potential on Pahawang Island, identification of the 4A related tourist attractions was carried out (Table 1). The 4A's identification includes Attraction, Accessibility or Accessibility, Amenity or Amenities, and Ancillary or Additional Facilities. This is a determination to be able to make a benchmark for the formation of tourism. The following can also be seen regarding the completeness of information on tourism

supporting facilities and infrastructure which can be seen using a map in Figure 4.



Figure 4. The beauty of the landscape in Pahawang Island

3.3.1 Attraction

Beach tourism on Pahawang Island is one of the tours that can be enjoyed when you arrive on this island. Beach tours that can be enjoyed are located in Jelarangan and Cukuh Bedil. In addition, there are several inns that present the natural beauty of the beach, but there are also inns that do not present the beauty of the beach but lead directly to the sea. Tourists who come usually come from groups of small or large families, office activities, campus activities or campus organizations, and youth associations. The color of the white sand, with clean conditions make this beach look beautiful. The sea water is clear with a blue color, so that small fish are often seen on the seashore. We can often find sea algae and even seagrass plants around the coast. In addition to small fish, several types of crabs, hermit crabs, and even shells are also found adorning the beaches on this island. Beach spots can be enjoyed by tourists even if they don't stay overnight. Various activities can be done while enjoying the beach, for example playing in the sand, playing on swings, because several beaches provide these rides. Tourists can also swim or play banana boats. For security, such as buoys, there is usually a separate rental service provided. In addition, tourists can also sit back and relax to enjoy the natural beauty that exists. This is what makes a lot of interest from tourists to come to this island. Beach tourism is one of the objects of tourist attraction and can be and can be an alternative marine tourism activity [37]. Explained the potential for coastal tourism must be empowered to be able to increase the value of beach recreation [38]. Several things need to be considered in this regard, beach tourism objects do need development, several things that need to be addressed starting from the accessibility of roads, ports, as well as the quality of the community and tourism business actors so that the concept of sustainability can run well [39].

The next tour is mangrove tourism, this tour exists because the mangroves on Pahawang Island are quite extensive around the island. The diversity of mangrove species is quite a lot, as well as being a habitat for several animals such as birds, langurs, monkeys, and small fish, making the mangroves on Pahawang Island one of the most attractive tourist destinations. The existence of mangroves on this island is one of the supporters to see the types of small fish. This is because mangroves are a means for several types of fish to spawn. The types of mangroves that exist include *avicennia*, *bruguiera*, *rhizophora*, and mangrove associations. Several things need to be considered to be able to create a mangrove center such as tracking paths, photo spots, and infrastructure. To develop mangrove tourism, it is necessary to look at several aspects, such as an example of a case study in the Mangrove Area in Klong Kone, Thailand that several things need to be measured starting from measuring strengths, weaknesses, opportunities, and threats, after that analyze the activities of tourists, facilities, communities, and stakeholders [40]. This will show the life cycle of mangrove ecotourism, whether it runs or not.

Underwater tourism is snorkeling, which is intended to see more and clearer types of fish and see sea anemones. This tour can make Pahawang Island famous because the underwater is still very good and clear. Several spots for snorkeling have also been determined, one of which is in Cukuh Bedil. This tour also has a trained guide for snorkeling. For completeness of equipment is also available, where there is a place to rent snorkeling equipment on this island. in a case study located [41] on Derawan Island, East Kalimantan which has the potential for marine tourism which can be developed for underwater tourism such as diving and snorkeling. The underwater potential that has beauty such as coral reefs, several species of reef fish, and the quality of seawater is also a selling point in developing tourism on the island.

Pahawang Island also found animals with langur species scattered in several locations. These animals have the potential to be used for tourism with special interest types of tourism. Special interest tourism can also be implemented on Pahawang Island, one of which is special interest tourism for langurs. The type of langur on this island is the gray langur (*Trachypithecus cristatus*). This animal has the characteristics of a slimmer body size, a long tail, the color of the fur is gray, and the size of the legs is longer than the hands that look shorter. Usually, these animals live in groups on trees (arboreal). The population is scattered in almost every hamlet or agroforestry and mangrove area. To do this tour it must be done at a certain time, for example in the morning from 05.00 to 09.30 and in the afternoon at 16.00 - 18.10.

The tourism activity carried out is to pay attention to the langur primate group. Attractions that can be enjoyed

include langur activities when moving, grooming (cleaning themselves), how to eat langurs, as well as seeing these primates with their children (baby langurs). The activity of moving langurs usually does not go down to the ground but jumps on each branch or tree branch to one tree and another. At the time of grooming, the langurs usually clean themselves such as searching for fleas, usually done between individuals with one another or between mothers and their children. To see langurs eating, they usually prefer fruit, flowers, or young plant shoots to eat. This is usually done to make it easier for the langurs to digest.

These animals can be seen in spots scattered on Pahawang Island. there were several spots with a total of 23 points, and 23 groups of langurs were found. The most common spots found are usually on agroforestry land, compared to mangrove forests. This is because agroforestry land has more food sources, compared to mangrove forests. When this tour is carried out, tourists can enjoy the natural beauty that is along the path to the observation spot. The beauty is in the form of beaches, sea, mangrove forests, and agroforestry. There are 23 points langurs were grouped into five observation spots, because several langur groups were located close together. The distribution of langurs on this island can be used as tourism potential with the concept of special interest [42].

Cycling tours with routes around the island are also one of the destinations that need to be tried to enjoy Pahawang Island in a slightly different way. This tour is intended for sports as well as being able to enjoy the beauty of the existing landscape. The beauty of the landscape provided is beaches, sea, hills, mangroves, and agroforests. To be able to enjoy bicycle tours, what is needed of course is a bicycle and also its accessories such as helmets, shoes, and gloves. Road or bicycle track facilities also meet the standards for bicycle tours. The road area on this island is 23.7 ha.

Another potential that exists on Pahawang Island is the existence of a mountain that people usually call Mount Sacred or Mount Keramat. The mountain can be one the potential for climbing tourism. To get to the top of the mountain, the climbing route has been made by the local community. Even though the path is a bit steep, it's still passable. The existing path is only a path that is usually traversed by the garden community. The condition of this mountain when it entered the foot of the mountain, was indeed a community-owned area whose contents were agroforestry. The higher you will see the bushes, as well as the trees. There are trees but the size of the trees found are of standard size, not as large as in natural forests. Next, you will meet a steep rocky road, then the higher you will see the expanse of sea and hills or mountains across the island. Apart from being tourism potential, this mountain also plays a role in conserving clean water resources. Sukardi et al. [43] stated clean water resources must be properly conserved so that the needs of local communities can be met.

Another potential that exists in Mount Keramat is religious tourism. This tour can be used as an attractive destination for religious activities relating to Muslims. The location is the same as climbing tourism, namely on the sacred mountain. Usually, this tour is intended for people who want to make pilgrimages to sacred tombs. Some of the actual tourists have already come, but many do not know because of limited information. To do this tour, you must be with a caretaker, so that unwanted things do not happen. In addition, the caretaker will show the way, and provide directions when he arrives at the sacred location. The sacred mountain is commonly called the tread of traces of Sekh Kuncung Maulana Muhammad Mustofa with a name that is often known, namely Sekh Kuncung Maulana. This person can be called a priyai who came from Banten, with family descendants namely Sekh Maulana Hasanudin and Sekh Syarif Hidayatullah.

3.3.2 Accessibility

Accessibility is a form of infrastructure needed on Pahawang Island. This is very influential on the development of tourism, as well as the interest of tourists to come. Accessibility on this island includes roads, piers, and boats. The existing road is 25,000 km, with footpath conditions, with a road width of ± 3 m. There are two types of island roads, namely dirt roads and concrete/concrete roads. Each has different conditions, namely dirt roads with a length of 7,000 km and block roads with a length of 18,000 km. For roads in the damaged condition of 14,500 km and roads in good condition of 3,500 km. Furthermore, there are six piers in each different hamlet.

The location of the pier includes the piers in Suak Buah, Penggetahan, Pahawang, Jelarangan, Kalangan, and Cukuh Nyai. The condition of the pier is in good condition and usable. In addition, ships are also needed as a means of crossing transportation. There are 27 ships, including motorboats and boats. The majority of these facilities belong to the island community, which is usually used for crossing transportation. The condition of the ship is in good condition and is very suitable for use. This means of transportation is used to take guests or just a means of crossing the community between the opposite islands.

3.3.3 Amenity

The next indicator, namely Amenity or Amenities is a form of service facilities for tourists. The forms of service facilities include places of worship, public toilets, food stalls/canteens, snorkeling equipment rental services, and lodging. Pahawang Island has eight places of worship, namely mosques/mucho la, with fairly good conditions. However, it is better to provide additional mukena in several places, as well as sufficient water, and the cleanliness of the toilet is also maintained properly. In this case, the condition of the MCK must be very clean, so that it does not smell and is comfortable to use. There are six public toilets or public MCK facilities in fairly good condition.

The amount of water is also sufficient, but some toilets are not clean enough. In addition, there are other facilities, namely stalls.

Stalls on Pahawang Island are very easy to find and are scattered in every hamlet. The types that are commonly found usually sell basic needs for the community. There are usually many food stalls in Jelarangan Hamlet because most of the tourism is centered in that location. Usually what is sold includes boiled noodles, fried noodles, chicken noodles, meatballs, fried foods, grilled fish, etc. Food stalls are expected to be in every tourist attraction so that tourists who come have no trouble finding food. In addition, snorkeling equipment rental services are also available on this island, there are eight rental places engaged in these rental services. Other supporting facilities are lodging (Figure 5).

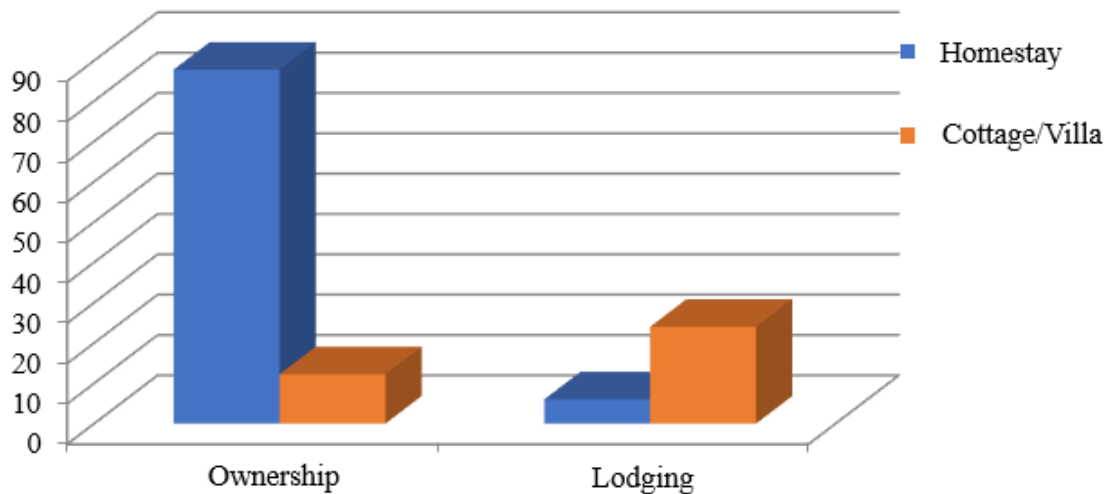


Figure 5. Percentage of total ownership and lodging

The existence of several tourism potentials is a benchmark for tourists in choosing what tourist spots to enjoy. From the results of a survey regarding tourist visits related to several tourism potentials, various results have been obtained. By taking a random sample of 30 people, and doing three repetitions with a certain time interval during the study. The results show that around 67% of tourists said they would try other tourism potentials on Pahawang Island, besides that 33% of other tourists chose not to (Figure 6). This is because tourists who come prefer to snorkel and enjoy the beauty of the ocean from the cottages or villas, they live in.

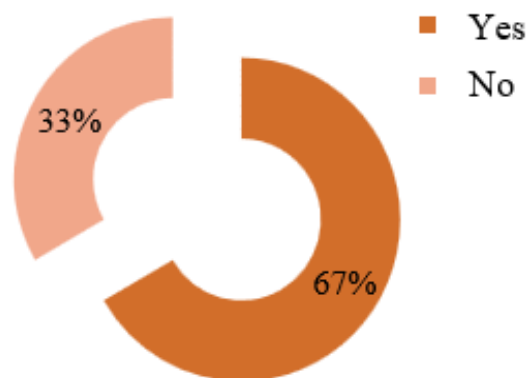


Figure 6. Percentage of tourists who want to enjoy the new tourism potential in Pahawang Island

3.3.4 Ancillary

Additional facilities on Pahawang Island are an information center for tour managers, tour guides (guide), WIFI network, and electricity. The information center is located at the village office, while information on the layout of the infrastructure can be seen in Figure 7. The information on the map includes roads, villas, schools, mosques, community-protected forests (Gunung Keramat), hamlets, piers, and cottages. A tour guide (guide) in charge of providing information about what tours are available. Give directions, as well as tell what kind of facilities exist on this island. The WIFI network is also an additional facility, it is very helpful for easier internet access. Electricity is an important additional facility for several things such as lighting and other electronic devices. The existing additional facilities are expected to make it easier for tourists and provide comfort while on vacation.

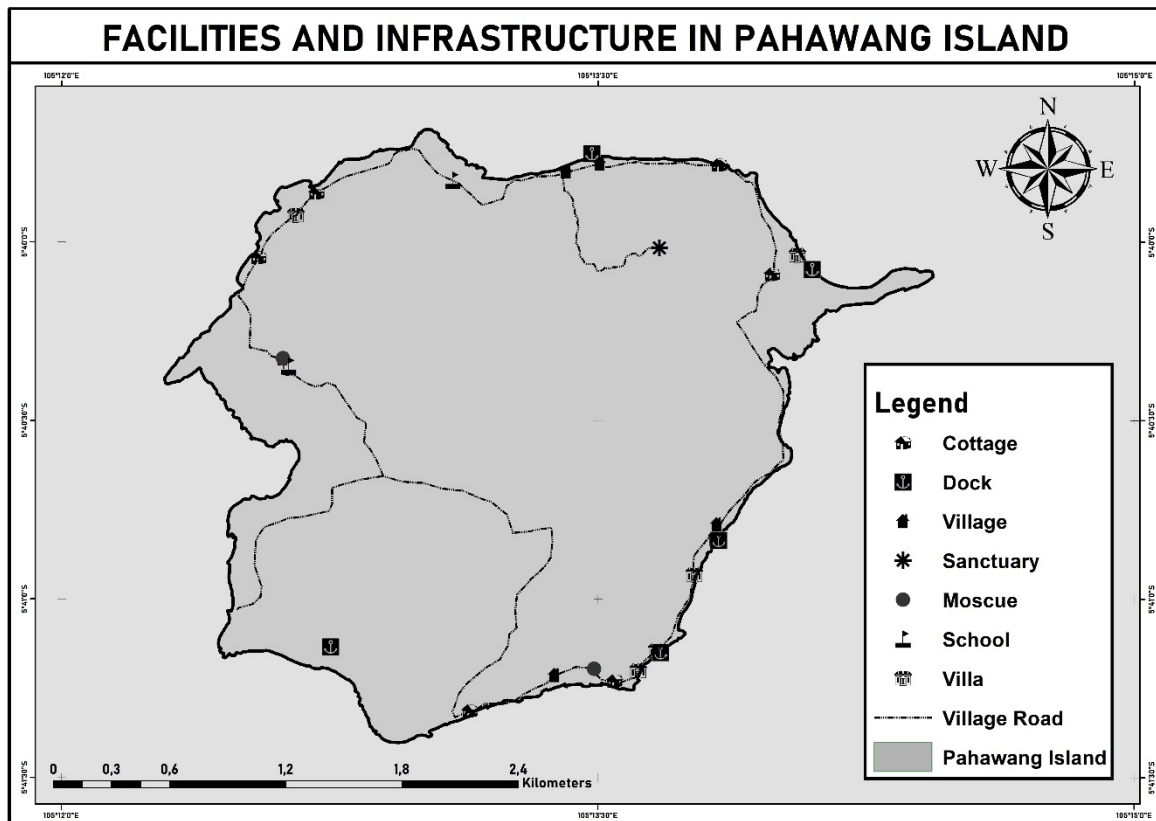


Figure 7. Map of facilities and infrastructure in Pahawang Island

4. Conclusions

The development of existing tourism potential on Pahawang Island begins with identifying land use patterns, types of existing tourist attractions, accessibility, amenities, and ancillary service. Most of the management of tourism on this island is carried out by the local community, with the help of the local government. Public knowledge about tourism must be further improved, maintaining hospitality, cleanliness and comfort of tourists also needs to be considered so that tourists are expected to be able to visit again.

Data Availability

The data used to support the research findings are available from the corresponding author upon request.

Conflicts of Interest

The authors declare conflicts of interest.

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