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Development of The Potential of The Angke Kapuk Mangrove Forest Natural for Ecotourism in Kamal Muara Village, Penjaringan Sub-District, North Jakarta

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ABSTRACT

Mangrove forest ecosystem has various ecological, socio-economic and cultural functions for society, such as for nature tourism or ecotourism activities. The purpose of this article is to discuss the potential for the development of the Angke Kapuk Mangrove Forest Nature Park (TWA), North Jakarta for ecotourism activities. The research method used in this study was qualitative method. The results of the study showed that there are various strengths that are potential for the Angke Mangrove Forest to be developed for ecotourism, such as the strategic location of tourist attractions, the presence of natural tourism objects, and the existence of interesting a variety of flora and fauna species of mangroves for visitors. However, the Angke Kapuk Mangrove Forest still has some weaknesses. Therefore, for the development of these natural tourism or ecotourism areas in the future, it is necessary to pay attention to the principles of ecotourism, such as tourism activities must minimize negative impacts on the environment, the need to increase the active participation of residents.

Keywords: *Ecotourism, Mangrove Forest, Kamal Muara, Nature tourism.*

INTRODUCTION

Mangrove forests are typical forests that grow in tidal areas, such as river estuaries, lagoons and beaches that are protected by a substrate of mud or sandy mud (Putra & Gumilang, 2019). Indonesia is a country that has around 17,000 islands, with a coastline of around 99,03 km^2, and has a wide stretch of mangrove forest of around 95,000 km^2 along the coast. Therefore, Indonesia has the largest mangrove area in the world (Hamilton & Casey, 2016).

The area of mangrove ecosystems in Indonesia reaches 75% of the total area of mangrove areas in Southeast Asia (Putra & Gumilang, 2019). While globally in the world, the area of mangrove ecosystems in Indonesia is around 26% - 29% of the area of mangroves in the world (Sofian et al, 2020; Sasmito et al., 2023).

Mangrove ecosystems have many functions, ecologically, socio-economically and culturally. The ecological functions of mangroves include as a wave and wind absorber for the area behind them, protecting the coast from abrasion, tidal waves/robs, tsunamis, retaining mud and trapping sediment transported by surface water flows, preventing seawater intrusion into the mainland, and can neutralize water pollution to a certain extent, and help reduce greenhouse gas emissions, such as CO2 (Putra & Gumilang, 2019; Sofian et al., 2019; Arifanti, 2020). While the socio-economic and cultural functions of mangroves include wood products for fuel; building material; fishing activities as poles, anchors, and anchorage of boats; household needs, such as medicinal ingredients, food and beverage ingredients; fishing grounds for fish, shellfish and crustaceans for fishermen, and for natural tourism objects (Noor et al, 1999). Especially for nature tourism, mangrove ecosystems are very important for ecotourism. Ecotourism is a trip to natural areas that is carried out with full responsibility for environmental conservation and provides benefits to local communities and increases their welfare (Soemarwoto, 2004).

Even though the mangrove ecosystem has many ecological and socio-economic cultural benefits, in its development many mangrove areas in Indonesia have been damaged. For example, the cover of mangrove vegetation in the Pantai Indah Kapuk (PIK) area, North Jakarta from 2010 to 2015 experienced a change in area consisting of a reduction of 38.79 Ha or 44 %. While nationally in the last three decades, Indonesia has lost 40% of its mangroves. Thus, Indonesia has the greatest speed of mangrove destruction in the world (Putra & Gumilang, 2019).

Many factors may cause various damage to mangrove ecosystems, such as conversion of mangrove land into shrimp and fishponds, dredging and flood protection, construction of sea walls and embankments, industrial and road development, and construction of tourism facilities (Sofian et al, 2020; Azzahra et al, 2022). The northern coastal area of Jakarta is one of the ecosystems in the Jakarta Bay that is experiencing environmental stress. One of the reasons for this pressure is the buildup of population concentration as a result of regional developments that are experiencing growth in various sectors such as trade centers, settlements, government centers, recreation, education, and others (Agus et al., 2014). The Angke Kapuk Mangrove Ecosystem (MAK) as one of the remaining ecosystems on the north coast of Jakarta and having a number of ecosystem services, is currently facing potential threats of degradation so it

is very important to know its condition (Sofian et al, 2020). In fact, the Angke Kapuk Mangrove Forest Nature Park (TWA) in Kamal Muara Village, Pejaringan District, has great potential to be developed as an ecotourism area in Jakarta.

The purpose of this article is to discuss the potential for the development of the Angke Kapuk Mangrove Forest Nature Park (TWA), North Jakarta for ecotourism activities. Three aspects, namely biophysical environmental conditions, ecotourism activities, and development of the Angke Kapuk TWA for the ecotourism program will be elucidated in this article.

LITERATURE REVIEW

Mangrove Forest Ecosystem

Mangroves are forest ecosystems formed by halophytic, woody, seed-bearing plants which range in size from tall trees to small shrubs. They have the ability to grow along sheltered, intertidal coastlines on sediments that are saline, often aerobic and sometimes acidic (Rizal et al. 2018). The mangrove forest ecosystem is one of the costal ecosystems that are composed by various abiotic factors, including soil, water and air, etc. and biotic factors, such as shrimps, mangrove crabs, fishes, water birds, and mammals (Pratiwi & Rahmat, 2015; Iswandaru et al., 2019; Wahyudi, 2022).

The benefits of the mangrove forest ecosystem

Mangrove forest ecosystems have various important ecological and socio-economic and cultural functions for the community. The ecological functions of mangroves, such as habitat for various types of fauna, such as shrimp, mangrove crabs, fish, bird species, and mammals (Iswandaru et al. 2018; Arifanti 2022; Ginantra, 2022; Zulfandi et al., 2023). While the ecological functions of mangrove forests include maintaining soil fertility, protection of shorelines from erosion, storms, tsunamis, and sea-level rise, water purification, and to sequester and store carbon (Sasongko et al., 2014; Afrinanti, 2022). In addition, other socio-economic and cultural functions of mangroves, such as for educational objects and natural tourist attractions, such as ecotourism (Riefani & Arsyad, 2019; Afriani 2022), are also for places of business. Therefore, the existence of forest ecosystems is very important to be maintained, so that the various benefits can be maintained in a sustainable manner.

Damage to the mangrove ecosystem

Although the mangrove ecosystem has an important ecological, socio-economic and cultural function for the community. However, nowadays the mangrove ecosystem is experiencing a lot of pressure and is the most threatened tropical ecosystem in coastal areas (Ahmed & Glaser, 2016). Many factors can cause damage to mangroves, such as the opening of large-scale brackish ponds (*empang tambak*) and the conversion of mangrove land to various other uses, and pollution and climate change (Brander et al., 2012; Friess & Webb, 2014; Carrasquilla-Henao et al.2019). Indeed, the potential threat of mangrove degradation is greater in areas close to centers of economic activity (Kustandiyo, et al., 2014). According to Hamilton and Casey (2016), during the period 2000-2012 the trend of decreasing mangrove area in Indonesia has an average rate of between 0.2% - 0.66% per year.

The negative impacts of various damage to mangroves can cause changes or loss of various ecological and socio-economic benefits of mangrove culture for the community, especially for coastal communities (Malik et al., 2017). Therefore, it is necessary to manage mangrove forest ecosystems properly and appropriately, so that the various ecological, socio-economic and cultural benefits of the ecosystem can be maintained in a sustainable manner. One of the efforts to utilize mangrove forest ecosystems in a sustainable manner is to develop them for ecotourism.

Mangrove forest for ecotourism

Ecotourism has various definitions. According to The Ecotourism Society (Soemarwoto, 2004; Lindsay, 2003), ecotourism is a trip to natural areas that is carried out with full responsibility for environmental conservation and benefits local communities and improves their lives. Ecotourism has specific criteria, such as tourism activities in relatively undisturbed natural areas; minimum impact on the environment; conservation of natural and cultural heritage; active participation of local residence who benefit from the tourism; income from tourism contributes to sustainable development; and natural and cultural educational experiences for tourists.

Among various specific criteria as mentioned earlier, an important thing from ecotourism activities is that ecotourism emphasizes the participation of local communities starting from the origination of ideas, planning and implementation and strives for an equitable and fair distribution of benefits between local communities and outside investors. Local residents must receive reasonable benefits that can support their lives with their families at a decent standard of living from ecotourism development.

Mangrove forest ecosystems have high potential for ecotourism development which may benefit for tourism activities with minimum impact on environment, providing benefits for local community, and income from tourism contributes to sustainable development. Some mangrove forest ecosystems have been developed in many areas of Indonesia. For example, several mangrove forest areas in Bali, such as Segara Guna Batu Lambang, Segara Luhur Batu Lumbang, Kampung Crab, Nusa Lembongan, Pejarakan Buleleng, and Perancanak Jembrana Village, have been sufficiently developed to become well-managed ecotourism areas that have been developed for ecotourism by non-governmental organizations or local government. Ecotourism of mangrove forest ecosystems may provide interactive experience, good knowledge for visitors about the existence of flora and fauna in the mangrove forest ecotourism area (Ginantra, 2022). As one of tourism types, ecotourism can provide positive impacts and maximum benefits for all levels and groups of society, government, private sector, and for tourists (Ngarbingan et al., 2023). In addition, the ecotourism an important role in conservation of mangrove forest due to this tourist activities may cause minimum impact on the environment; conservation of natural and cultural heritage, and provide some economic benefits for local community (Lindsay, 2003).

RESEARCH METHOD

Data collection techniques

The research method used in this study used a qualitative method (Newing et al. 2011). To collect field data, several techniques were used, such as field observations, semi-structured interviews, SWOT, and literature analysis (Newing et al., 2011; Rangkuti, 2016). Field observations were carried out to get an overview of the local environment of the Angke Kapuk Mangrove Forest Nature Park (TWA) in Kamala Muara Village, such as the condition of the mangrove forest, nature tourism facilities, and visitor activities. Semi-structured interviews (deep interviews) were conducted with purposively selected informants who were considered competent. The informants were the Head of the Natural Resources Conservation Agency (BKSDA) 1 person, the Head of SKW III BKSDA 1 person, the Secretary to the sub-district head of Penjaringan Subdistrict 1 person, the Head of the Forest Resources and Watershed Conservation Section 1 person, the Lurah Kamal Muara, Penjaringan District 1 person , Manager of Angke Kapuk TWA 1 person, Mangrove KOMMA Manager (Mangrove Management Community) 1 person, and Visitors/tourists of Angke Kapuk TWA 10 people, with a total of 19 informants.

While the SWOT technique was used to determine the strategy for the development of the Angke Kapuk mangrove forest TWA for ecotourism, special interviews were conducted with informants regarding Strengths (Strength-S), Weaknesses (Weakness-W), Opportunities (Opportunities-O), and Threats (Threats-T) towards the Angke Kapuk Mangrove Forest Natural Tourism Park (TWA) in Kamala Muara Village (Rangkuti, 2016). In addition, literature studies were also carried out from various sources, such as research reports, village statistics, and others

Data analysis technique

Various data collected through field observations, semi-structure interviews, SWOT, and literature data, were analyzed by cross-checking, summarizing, synthesizing, and to build up a narrative account (Newing et al., 2011; Iskandar, 2018).

The cross-checking means cross-checking data collected from various sources, such as data based on deep interviews with competent informants, cross-checked with data collected from observation notes based direct observation in the field, drawings and photos, reports, etc. In other words, the data that has been collected is triangulated, by cross-examining various informants, and data collected from other techniques, such as observations, reports, etc. Then, the data was coded to include conditions, context, action/interaction strategies, and consequences. In the next stage, everything that has been cross-examined is summarized, synthesized, and a make narrative is created in a sequential manner using descriptive analysis.

RESULT

Biophysical environmental conditions

The Angke Kapuk Mangrove Forest Nature Park (TWA) is geographically located at 6º06” - 6º07” South Latitude and 106º43” - 106º45” East Longitude. Meanwhile, administratively, this area is located in Kamal Muara Village, Penjaringan District, North Jakarta Municipality, Special Capital Region of Jakarta.

Based on ecological history, the Angke Kapuk Mangrove Forest Natural Tourism Park (TWA) was originally part of the Tegal Alur-Angke Kapuk mangrove forest area on North Jakarta Beach. The area was designated as a forest group based on the Decree of the Governor General of the Dutch East Indies (GHB) Number: 5 dated July 11, 1928, Directeur van landbouw an Nijverheid dated November 19, 1931. Meanwhile, the minutes of the boundary arrangement were set on January 10, 1934, and ratified on March 5 1934. In 1977, the Minister of Agriculture through Decree Number: 161/Kpts/Um/6/1977 dated June 10 1977 re-allocated the Tegal Alur - Angke Kapuk area into 5 main areas, namely: (1) Protection Forest, 5 km along beach 100 m wide; (2) Muara Angke Nature Reserve; (3) Tourism Forest; (4) Forestry Nurseries; and (5) Fields with Special Purposes (LDTI)

The Angke Kapuk Nature Tourism Park (TWA) is part of the Angke Kapuk forest area which was determined based on the Decree of the Governor General of the Dutch East Indies Number 24 dated 1 June 1939 with an area of 99.82 Ha. The type of ecosystem that is the habitat of various types of water birds is the mangrove ecosystem. The Angke Kapuk TWA Natural Tourism Concession permit was granted to PT. Murindra Karya Lestari since 1997. The aim as a means of natural tourism while at the same time maintaining the preservation of the function of mangroves as a life support system.

In 1988, most of the Angke-Kapok mangrove forest area was handed over to PT. Mandara Permai so that the issuance of Decree of the Minister of Forestry Number: 097/Kpts-II/1988 dated 29 February 1988 stipulating that the forest area to be maintained was 333.50 Ha. However, based on the results of the boundary demarcation in the field and the Minutes of Boundary Demarcation signed on July 25, 1994, it is known that the forest that is being maintained is 327.70 Ha.

In this regard, the Minister of Forestry re-established the designation and function of the 327.70 Ha Angke Kapuk Forest group through Decree of the Minister of Forestry Number 667/Kpts-II/1995 dated 15 December 1995 as: (1) Protection Forest (44.76 Ha); (2) Tourism Forest (99.82 Ha); (3) Muara Angke Nature Reserve (25.02 Ha); and (4) Land with a Special Purpose (LDTI) consisting of (a) Nursery (10.51 Ha); (b) PLN Transmission (23.70 Ha); Cengkareng Drain (28.39 Ha), and Toll Roads and Green Lines (95.50 Ha).

Flora and fauna

Several species of mangrove plants that are commonly found in the area, such as **api-api** (*Avicenia marina*), **pidada** (*Sonneratia caseolaris*), **mangrove** (*Rhizovora mucronata*), and **warakas** (*Acrosticum areum*). In addition, non-mangrove plant species were also found, including **waru laut** (*Hibiscus tiliaceus*), **flamboyant** (*Delonix regia*), **bidara** (*Ziziphus mauritiana*), **bluntas** (*Pluchea indica*), mendongan (*Scripus littoralis*), and **tengar** (*Ceriops* sp).

Regarding that the Angke Kapuk Nature Tourism Park (TWA) area is overgrown with mangrove vegetation, the area is a habitat for various types of fauna, such as mammals, birds, reptiles and fish, mangrove shrimp and mangrove crabs (Muzadid et al. 2020; Wahyudi, 2022; Zulfandi et al, 2023). Species of mammals that usually live in the Angke Kapuk Nature Park Area (TWA), including **monyet ekor panjang**/long-tailed

macaque (*Macaca fascicularis*); some species of birds, especially water birds, such as various **kuntul**/egrets (*Egretta* spp), **cangak**/herons (*Ardea* spp), **blekok**/Javan Pond Heron (*Ardeola speciosa*), and **burung udang**/Javan Kingfisher (*Halcyon cyanoventris*); **ikan kecil**/small fish (*Gambusia* sp**); udang mangrove/**mangrove shrimp (*Thalassina anomata*); **kepiting mangrove**/mangrove crab (*Scylla* sp); and **biawak**/monitor lizard (*Varanus salvator*).

The existence of various species of flora that are typical of mangroves and non-mangrove can form special vegetation with, inhabited by a variety of mangrove fauna, which builds the coastal ecosystem of the Angke Kapuk Nature Park Area (TWA). The area has important functions: ecologically, socio-economically, and culturally. For example, as a socio-economic and cultural function among the interests of ecotourism. However, even though the mangrove forest area has many important functions, such as ecological, socio-economic and cultural functions, the mangrove area locally and globally has suffered a lot of damage, especially due to human disturbance (Carassquilla-Henao et al., 2019). Therefore, it is very important to study the Angke Natural Tourism Park (TWA) about its potential for sustainable ecotourism development.

Ecotourism activities

The Angke Kapuk Natural Tourism Park (TWA) area is an attractive place for visitors to the area. The area operates from Monday to Sunday, from 07.00 WIB to 17.00 Western Indonesian Time (WIB). Based on the management's documentation, on weekdays the estimated number of visitors in one day is around 30 to 50 people. While on holidays the number of visitors increases, usually around 300-600 people in one day. However, during the Covid 19 pandemic, the area was completely closed. Then when the area has reopened, the number of visitors is strictly limited, only allowed at 25% of the total visitors normally (Rumondang et al., 2021; Rizkyprima et al. 2023).

The price of admission for the Angke Kapuk Nature Park Area (TWA) is very cheap. The ticket price is IDR 3,000 for individual tickets, and IDR 5,000 for cars and motorcycles. Various facilities are available, including several canteens lined up accompanied by a parking area for cars in front of the gate. On the front there is written the name of the location and the address. Apart from that, on the inside there is a toilet on the left and a pavilion, and on the right there is a room for the manager of the area. At the entrance, several hundred meters ahead, there is a parking area that is long enough for visitors who come by motorbike (Rumondang et al., 2021; Rizkyprima et al. 2023).

Development of the Angke Kapuk TWA

To analyze the potential development of the Angke Kapuk Natural Tourism Park (TWA) for ecotourism, an analysis was carried out using the SWOT technique (Strengths, Weaknesses, Opportunities and Threats). The results of the SWOT analysis are presented in Table 1.

Table1. Result of SWOT analysis for potential development of the Angke Kapuk TWA for ecotourism

IFAS (*Internal Factor Analysis Summary)* / **EFAS** (*External Factor Analysis Summary)*	***STRENGTH* (S)**	***WEAKNESS* (W)**
	1. There is a Minister of Environment and Forestry Regulation Number 8 of 2021 concerning Forest Administration and the Preparation of Forest Management Plans and Forest Utilization in Protected Forests and Production Forests. 2. The location of strategic tourist attractions. 3. Availability of tourist attraction rides. 4. Maintained mangrove forest ecosystem. 5. Fauna is cultivated in situ and ex situ.	1. Facilities and infrastructure for mangrove forest locations that are still lacking. 2. There is still a limited number of workers to manage tourism objects. 3. Community empowerment capacity is limited. 4. Perception of expensive ticket prices for visitors. 5. Souvenirs at tourist sites in the mangrove forest come from outside the Jakarta area.
***OPPORTUNITIES* (O)**	**STRATEGY OF SO (S + O)**	**STRATEGY OF WO (W + O)**
1. Adequate infrastructure to the location of tourist objects. 2. The lack of natural mangrove tourism in Jakarta. 3. Public interest in traveling to nature tourism. 4. Foreign tourist visits. 5. Cooperation with the community in terms of empowerment.	1. The location of strategic tourist attractions requires adequate infrastructure to get to the location of tourist objects. 2. Availability of adequate tourist attraction rides to attract tourists. 3. There is a Regulation of the Minister of Environment and Forestry Number 8 of 2021 concerning Forest Administration and Preparation of Forest Management Plans and Forest Utilization in Protection Forests and	1. There is adequate infrastructure to the location of tourist objects, so the limited community empowerment capacity needs to be increased. 2. The facilities and infrastructure for the location of the mangrove forest which are still lacking need to be added because many people are interested in traveling to nature tourism. 3. Visits by foreign tourists Souvenirs at tourist sites in the mangrove forest

	Production Forests, so that collaboration with the community is needed in terms of empowerment. 4. The lack of natural mangrove tourism in Jakarta so that the mangrove forest ecosystem that is maintained needs to be preserved. 5. Visits by foreign tourists interested in the fauna that are cultivated in situ and ex situ	come from outside the Jakarta area. 4. Increasing the number of workers through the recruitment of local people in the empowerment process. 5. Improving the quality of souvenirs at mangrove forest tourist sites originating from outside the Jakarta area through community collaboration in terms of empowerment.
THREATS (T)	**STRATEGY OF ST (S + T)**	**STRATEGI OF WT (W + T)**
1. The occurrence of a sudden high tide. 2. Become a competitor for modern tourism. 3. Expensive ticket prices result in reduced number of tourist visits. 4. There was a migration of fauna because of the lighting from the Pantai Indah Kapuk Housing Complex. 5. Displacement of waste carried by rivers into mangrove forest waters.	1. There are competitors for modern tourism, regulations are needed that can cover the existence of TWA. 2. The strategic location of tourist attractions requires affordable ticket prices. 3. Anticipate tides for available tourist attractions. 4. Maintaining the mangrove forest ecosystem requires waste management. 5. The need for coordination between the Angke Kapuk TWA and PIK managers in setting up lighting to reduce fauna migration and the sustainability of fauna cultivation, especially in situ.	1. Make embankments, breakwaters to avoid high tides. 2. Increasing the quantity and quality of human resources to anticipate services for modern tourism. 3. Increasing the capacity of community empowerment in anticipation of modern tourism competitors. 4. Adjustment of entrance ticket prices to avoid a decrease in the number of visitors. 5. Empowering the community around TWA in making souvenirs (specifically mangrove plants) so that they are competitive with modern tourist objects.

Source: Tabulation of the primary data (2022)

DISCUSSION

Based on SWOT Analysis (Table 1), it can be seen that Angke Kapuk TWA has various strengths for ecotourism development, for example (1) There is a regulation of the Minister of Environment and Forestry (KLHK) Number 8 of 2021 concerning Forest Management and Preparation of Forest Management Plans and Forest Utilization in Protected Forests and Forests Production; (2) Strategic location of tourist attractions: (3) Availability of tourist attraction rides; and (4) a preserved mangrove forest ecosystem; and (5) Fauna cultivated in situ and ex situ.

Basically, these various strengths are in line with the concept for ecotourism development, such as being suitable for tourism activities in relatively undisturbed natural areas because these areas have been implemented in accordance with the Ministry of Environment and Forestry regulations. Another factor is the existence of a well-maintained mangrove forest ecosystem and the existence of a variety of typical mangrove fauna which can play an important role in natural and cultural educational experiences for tourists (Lindsay, 2003; Soemarwoto, 2004).

In general, although the Angke Kapuk TWA has various strengths, it still has various weaknesses, such as (1) Facilities and infrastructure for mangrove forest locations that are still lacking; (2) There is still a limited number of workers to manage tourism objects; (3) Limited community empowerment capacity; (4) Perception of expensive ticket prices for visitors; and (5) Souvenirs at mangrove forest tourist sites come from outside the Jakarta area. In particular, these various weaknesses from the principle of ecotourism, especially related to the limited capacity of empowering local communities. The reason is, according to ecotourism principles, an important aspect that must be considered is the need for the participation of local residents to benefit from these ecotourism activities. Some of the factors that also need attention based on ecotourism principles are that it must minimize disturbance to the environment, and income from tourism must contribute to sustainable development in Indonesia (Lindsay, 2003; Soemarwoto, 2004).

In this study, for efforts to develop the potential of Angke Kapuk TWA, in accordance with ecotourism principles, namely minimizing disturbance to mangrove forests, involving local residents, and contributing to sustainable development in Indonesia, some strategies can be proposed, namely the WT (Weakness- Threats), such as to maintain the existence of mangrove forests is expected (a) to make embankments, breakwaters to avoid high tides; (b) Increasing the quantity and quality of human resources to anticipate services for modern tourism; and (c) Empowering the community around TWA in making souvenirs (specifically mangrove plants) so that they are competitive with modern tourist objects (Table 1). The conservation aspect of maintaining the existence of mangrove forests and empowering local communities is very much in line with the concept of ecotourism (Lindsay, 2003; Soemarwoto, 2004) and an important aspect for supporting sustainable development goal of Indonesia (Sasmito et al., 2023).

Based on this study, various weaknesses and strengths have been identified as potential development of the Angke Kapuk TWA for ecotourism. However, the existing

conditions, the TWA Angke Kapuk has not properly managed based on ecotourism principles (Soemarwoto 2008; Butarbutar and Sumarno 2013; Ginantra, 2022). So, to realize the development of ecotourism in the Angke Kapuk TWA area, North Jakarta, it is necessary to continue by building a tourism model that is based on ecotourism, which is sustainable use of mangroves, which combines three main aspects, namely ecology, economy, and participating local community (Soemarwoto , 2018; Ginantra, 2022). Indeed, the proper government policies are necessary to minimize negative impacts of development of tourism industry, such as, increasing income differences of the community (Aprilliani et al., 2021).

Four strategies can be proposed for the ecotourism development of Kapuk Angke TWA, North Jakarta: strategy of SO, strategy of ST, strategy of WO, and strategy of WT. Strategy of SO is based on to take advantage of opportunities by utilizing the various advantages possessed by Angke Kapuk TWA for the development of ecotourism, including the availability of interesting objects for tourists, especially tourists from abroad, namely the existence of large and quite good mangrove forests, as well as rich a variety of fauna in mangrove forests, such as amphibians and reptilian, birds, primates, and others. In addition, its location is not far from the city of Jakarta, and its status has been protected by the Ministry of Environment and Forestry in 2021. Therefore, the mangrove forests and various species of fauna in the Angke Kapuk TWA must be carefully protected. This is because the destruction of mangrove forests and the reduction or disappearance of various fauna in the Angke Kapuk TWA can make the area less attractive for ecotourism activities. This is in line with the study results of Auliq et al. (2022) that there is a positive and significant influence of tourist attraction on the decision to visit. This means that the better the tourist attraction of the Angke TWA the greater the decision to visit tourists to this area.

The strategy of ST is a strategy of utilizing strength to overcome various threats. For example, considering that the objects that attract the Angke Kapuk TWA for ecotourism activities are natural ecosystems, such as mangrove forests, various fauna, and beaches and sea water. Therefore, various disturbances to environmental conditions, such as careless disposal of rubbish which can damage natural beauty, water conditions on beaches, disturbance of mangrove forests must be avoided. Indeed, various visitor activities that can cause damage to mangrove forests, coastal waters and animal disturbances need to be prevented. The reason is that damage to the natural conditions of the Angke Kapuk TWA environment could be detrimental to ecotourism activities.

The strategy of WO is to take advantage of the external opportunities to overcome weaknesses in the management of the Angke Kapuk TWA for ecotourism development. For example, considering that there are still limited facilities for access to tourist attractions, facilities for observing mangrove forests and various mangrove forest animals, there is still a lack of human resources, especially local residents, to support tourism activities. Therefore, to support sustainable ecotourism development, these various shortcomings or limitations must be addressed carefully.

Meanwhile, the strategy of WT is a strategy for solutions to assess the weaknesses of the Angke Kapuk TWA management and the threats they face or efforts to avoid threats

to overcome the weaknesses in managing Angke Kapuk TWA. For example, for ecotourism management, it is necessary for managers to involve local residents in ecotourism activities, so that it can provide economic benefits to local residents, and ultimately raise awareness among local residents to participate in conserving mangrove ecosystems, a variety of mangrove wildlife and the coastal environment. The reason is, they can realize that environmental damage to the Angke Kapuk TWA can cause a reduction in visitors to this tourist attraction, and also reduce economic income for local residents. In addition, there is a need to provide various skills training to local residents to support ecotourism activities at the Angke Kapuk TWA.

Generally, for more detailed to construct the appropriate development of the Angke Kapuk TWA, the further studies to build a management model for Angke TWA ecotourism development are still being continued. In this follow-up study must be emphasized on the construct model for the Angke TWA Ecotourism programs, including more study on the problem identification and definition; system conceptualization; model formulation; analysis of model behavior; model evaluation; policy analysis; and model use or implementation (Richardson and Puh III, 1983).

CONCLUSION

Based on the results of this study it can be concluded that the area of the Angke Kapuk Mangrove Forest Natural Tourism Park, Kamal Muara Village, Pejarungan District, North Jakarta has the potential to be developed as an ecotourism area, with various strengths, such as (1) There is a regulation of the Minister of Environment and Forestry (KLHK) Number 8 of 2021 concerning Forest Management and Preparation of Forest Management Plans and Forest Utilization in Forests Protection and Production Forest; (2) Strategic location of tourist attractions: (3) Availability of tourist attraction rides; and (4) a preserved mangrove forest ecosystem; and (5) Fauna cultivated in situ and ex situ.

It revealed that although Angke Kapuk TWA has various potential strengths for ecotourism development; however, nowadays it has also still various weaknesses, such as (1) Facilities and infrastructure for mangrove forest locations are still lacking; (2) There is still a limited number of workers to manage tourism objects; (3) Limited community empowerment capacity; (4) Perception of expensive ticket prices for visitors; and (5) Souvenirs at mangrove forest tourist sites come from outside the Jakarta area.

Therefore, for the development of the Angke Mangrove Forest TWA for better future ecotourism activities, it is important to fix various existing weaknesses, and pay attention to the main principles of ecotourism, such as tourism activities must minimize negative impacts on the environment, the need to increase the active participation of local residents who can benefit from tourism activities, and those tourism producers must contribute to sustainable development in Indonesia.

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