

THE ECONOMIC VALUE OF MANGROVE FOREST ECOTOURISM IN APAR VILLAGE, PARIAMAN CITY, WEST SUMATRA

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ABSTRACT

Before the mangrove forest in Apar Village was used as a tourist destination today, the community considered mangrove forests as wilderness plants that had no clear function and benefits that were never maintained. Many mangroves died due to drought and logger by the community for firewood to be far from sustainable. To manage and preserve the mangrove ecosystem, several efforts have been made, one of which is by quantifying the environmental services provided by the mangrove ecosystem. One of the environmental services of the mangrove forest ecosystem is the benefits of ecotourism. The results showed that the economic value of ecotourism in the mangrove forest covering an area of 10.62 hectares in Apar Village was Rp. 3,614,335.60 per year or Rp. 340,332.92 per Ha per year.

Research Paper

INOVASIA

Keywords: Ecotourism, Environmental Services, Mangrove Forests.

INTRODUCTION

Mangrove ecosystems are aquatic ecosystems with a number of environmental services, functions and specific ecological conditions (Krisnawati, 2017). Mangrove ecosystems are also called coastal forests, brackish forests or mangrove forests (Harahab, 2010). Mangrove forest is a form of unique and distinctive forest ecosystem found in coastal areas or small islands as a very potential natural resource. Mangroves have high economic and ecological values, but are vulnerable to damage if they are not wise enough to use them (Novianty, 2011).

Indonesia has the largest mangrove ecosystem in the world with an area of around 3,489,140.68 Ha (2015) and grows along 95,181 km of the Indonesian coastline. This amount is equivalent to 23% of the existence of mangrove ecosystems in the world with an area of 16,530,000 Ha. It is known that the area of mangroves in Indonesia in good condition has an area of 1,671,140.75 Ha, while the

remaining area of 1,817,999.93 is in damaged condition (Hadi, 2017). In Asia, almost 50% of mangrove ecosystems are found in Indonesia, most of which are in the provinces of Papua, East Kalimantan, South Kalimantan, Riau and South Sumatra (Purnobasuki, 2011).

Anwar (1984) in Saru (2014) states that mangrove ecosystems have important functions and benefits in the coastal environment which consist of three main functions, namely physical, biological and economic. All of these functions and benefits are environmental services provided by the mangrove ecosystem. According to Sutopo (2011) environmental services are the entire system that provides goods or services resulting from natural ecosystem processes and benefits humans and the environment.

Mangrove ecosystems in Indonesia are slowly decreasing in area. According to FAO (2007) from 1980 to 2005 mangrove forests in Indonesia decreased in area from 4,200,000 Ha to 2,900,000 Ha. This decline occurs because there is still no public awareness of the

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importance of mangroves, people tend to see benefits from an economic perspective without seeing from an ecological (environmental) perspective, so they tend to damage them. Economic activities that are not synergistic with the environment will have negative impacts such as environmental damage.

Public ignorance of the ecological benefits of mangrove forests also results in low awareness of mangrove forest conservation. Based on research (Musyafar, 2009) the knowledge of coastal communities about mangrove ecosystems influences people's behavior in preserving mangrove ecosystems, while people's attitudes towards preserving mangrove ecosystems are influenced by their intention to do so in the future.

One of the mangrove ecosystems found in Indonesia is in Pariaman City, West Sumatra Province. The Mangrove Forest of Apar Village is one of the quite extensive mangrove areas in Pariaman City. In this area, the problem is that there is still low public knowledge of the functions and benefits of mangrove ecosystems so that their perceptions and attitudes are still lacking in efforts to preserve mangroves. Before the mangrove forest was developed into a tourist spot as it is today, the community considered mangrove forests to be just wild plants whose functions and benefits were unclear, so they were never maintained.

Many mangrove plants have died due to drought and some are taken by the community for firewood so that the mangrove ecosystem is far from being sustainable. According to Setiawan (2017) people's perceptions and attitudes are closely related to the success or failure of community behavior in supporting efforts to preserve the mangrove ecosystem on Tanakeke Island.

To manage and preserve the mangrove ecosystem, several efforts have been made, one of which is by quantifying the environmental services provided by the mangrove ecosystem, one of the environmental services of the mangrove forest ecosystem is the benefits of ecotourism. The quantification of these environmental services can be used as a reference in terms of

developing coastal area management strategies to maintain the existence and sustainability of mangrove ecosystems (Harahab, 2010).

In this paper, one can see the economic value of ecotourism in the mangrove forest of Apar Village, Pariaman City. The economic value of mangrove forest ecotourism is relatively high because this area has just been made into an ecotourism area, so efforts are needed to maintain the mangrove area as a green open space area to support people's lives in Pariaman City.

LITERATURE REVIEW

Mangrove forest is a more specific ecosystem when compared to other ecosystems because it has uniform vegetation and an even crown, does not have a crown layer with a distinctive shape and is always green (Irwan, 1992). Mangrove forest is also a community of tropical coastal vegetation colored by several types of mangrove trees that are able to grow and develop in tidal and muddy areas. This vegetation community generally grows in intertidal areas that are sufficient to get regular seawater plants and fresh water flows and are protected from large waves and strong tidal currents (Bengen, 2000).

Riyastini (2015) explained that in general there are two functions of mangrove ecosystems that can be felt by humans and their environment, namely direct and indirect functions consisting of ecological (physical, chemical and biological) and economic functions. Kusmana (2003) states that there are 3 main factors that cause damage to mangrove ecosystems, namely: a) Pollution such as oil and heavy metals; b) Mangrove conversion that pays little attention to environmental factors such as aquaculture (ponds), agriculture (rice fields, plantations), roads, salt production, settlements and mining; c) Excessive felling.

Economic valuation in the context of the environment is about measuring people's preferences for a good environment compared to a bad environment. Economic valuation is fundamental to thinking about sustainable development (Harahab, 2010). Munasinghe (1993) explains that the basic concept of

economic valuation that underlies all valuation techniques is the willingness to pay for environmental services or resources (Hufschmidt, 1987 in Fauzi, 2004).

METHODS

Location of study and time of research

This research began from September to October 2018 which took place in the mangrove area of Apar Village, North Pariaman District, Pariaman City, West Sumatra Province. The type of data collected in this study is qualitative data. According to Sugiyono (2008) qualitative data is data obtained during natural conditions (natural setting) and obtained through observation, in-depth interviews and documentation.

For data sources taken from this study are primary data and secondary data. Sugiyono (2008) added that primary data is data obtained directly by the data collectors, namely the researchers themselves, the data was obtained through observation and interviews using questionnaires prepared according to the research objectives. While secondary data is data obtained indirectly by researchers but through related parties according to what data needs are desired. Secondary data were obtained from the Office of Maritime Affairs and Fisheries of West Sumatra Province, the Office of the Head of Ampalu Village, the Office of the Head of Apar Village and other institutions as well as the results of previous studies related to research material

Sample/Respondent Selection Method

The respondents used were tourists who visited the mangrove forest of Apar Village. The population is not clearly known because entry tickets are not provided to enter the mangrove tracking tourism area, so it is not possible to see the exact number of visits. However, information from parking attendants in the mangrove tracking tourism area the number of visits every Saturday and Sunday is approximately 100 tourists, from this information it can be predicted the number of visits in one month, to be used as a population.

Visitor samples were taken using the quoted accidental sampling method, namely a

sampling technique based on chance (Sugiyono, 2008). This technique is applied to individuals who are coincidentally found in mangrove forest tourism locations when conducting research, namely Saturdays and Sundays. Respondent's age is limited to a minimum of 15 years. Determination of the number of respondents using the Slovin formula, namely:

$$n = \frac{400}{400(0,1)^2 + 1} \quad (1)$$

$$n = 80 \text{ Respondent}$$

Data analysis procedures

As a tourist spot, seeing the economic value of mangrove forests uses the travel cost method of economic valuation, namely the amount of money and time sacrificed by visitors to mangrove tracking tourist attractions such as: transportation costs, consumption costs, documentation and parking costs. The total travel costs are obtained by multiplying the total travel costs per respondent by the number of visits they have made in the past year. Estimating the benefits of mangrove forests as an ecotourism site using the travel cost method which includes transportation costs, consumption costs, documentation costs, parking costs).

$$MTL1 = \sum_{i=1}^n TCMi \quad (2)$$

$$\sum_{i=1}^n TCMi = BT + BK + BD + BP \quad (3)$$

Information:

MTL1 = Total indirect benefits as an ecotourism site

TCMi = Total travel expenses of the ith respondent

BT = Transportation costs (rp/respondent)

BK = Cost of consumption (rp/respondent)

BD = Documentation fee (rp/respondent)

BP = Parking fee (rp/respondent)

RESULTS AND DISCUSSION

Location and Area of Mangrove Ecosystem

The total area of the mangrove areas of Apar Village and Ampalu Village based on area taking using the Google Earth and Arcgis applications in September 2018 is 10.6161 ha.

With details in Apar Village the mangrove area is 9.9491 ha (93.72%) and Ampalu Village is 0.6669 ha (6.28%).



Figure 1 Location and Area of Mangrove Forest

Types of Plants Found in the Mangrove Ecosystem of Apar Village

Based on the literature study and the findings of researchers in the field, in the mangrove forest ecosystem found plants such as: Kurap Mangroves (*Rhizophora*

mucronata), Bakau (*Rhizophora apiculata*), Nipah (*Nypa fructicans*), Jeruju (*Dolichandrone spathacea*), Pinago (*Calophyllum inophyllum*), Nibuang (*Oncosperma tigillarum*), Pidada (*Sonneratia caseolaris*), *Acanthus ilicifolius*.



Figure 2 Types of plants found in the mangrove forest of Apar Village

The Economic Value of Ecotourism Mangrove Forest in Apar Village

From the results of data processing, the average age of visitors to mangrove tracking tours is dominated by 15-20 years old (54%), this is because mangrove tracking tours are still considered not good, so to visit the community, they only walk by tracking for 50 meters and the capacity to enter is limited. , so there are still few visitors of mature age due to

the conditions of the tour, so there are more teenagers at the age of high school and undergraduate students who visit the mangrove tour. They went to the mangrove tracking just to take pictures and only a few read and understood the education boards provided along the tracking. The percentage of other tourist visitor age levels is 21-25 (23%), 26-30 (16%) and >30 (7%).

Table 1 Age level of visitors to the mangrove tracking tourism in Apar Village

Age Level of Tourist Visitors				Amount
15-20 Years	21-25 Years	26-30 Years	>30 Years	
43	18	13	6	80
54%	23%	16%	7%	100%

Visitors from the Apar Village Mangrove tracking tour were grouped based on the area of origin of the visitors, then the researchers grouped them into three zones namely zone one, zone two and zone three. The grouping of these zones is based on the distance from the tourist sites. In the zone one City or Regency that entered, namely Kota Pariaman, Kab. Padang Pariaman and Padang City. Cities or districts that fall into zone two are Padang Panjang City, Batusangkar City and Bukittinggi City. The zone three cities and regencies that are included are Payakumbuh City, South Solok Regency and Pekanbaru City.

From the results of data processing, it can be seen that the most visitors came from the Zone one area, namely Padang Pariaman Regency, which had the highest number of visitors (49%). This is because this area is located close to the mangrove area, for beach tourism for the community closest to Pariaman City, mangrove tourism is an option because in Pariaman City there is only one mangrove tour that has tracking. The area with the second most visitors is the people of the city of Pariaman themselves with a percentage of visitors (21%), even though this number is relatively small because the mangrove tracking tour is located in Pariaman City, this is because the average community at the beginning of the opening of the mangrove tracking tour has visited, so they have seen mangrove tourist attractions and feel that they have visited before.

Same with the city of Padang (20%) people who visit mangrove tourism because they are curious about this tour, because in the city of Padang there are no tours with the concept of tracking mangroves, and access from the city of Padang to the mangrove area is quite easy. Even so, the average community visit to mangrove tourism is generally carried out for the first or second time, this is because the length of tracking in the mangrove area when conducting research is still relatively short, namely 50 meters, so visitors are not satisfied enough to travel.

The second zone is Padang Panjang City (3%), Batusangkar City (1%), Bukittinggi City (3%), these three cities take an average of two to three hours to the mangrove area. The people from these three cities visiting did not make mangrove tourism their main goal, on average their main goal was to go to Gandoriah beach or just to see the turtle breeding grounds which are close to the mangrove tracking area. Besides that, people from the three cities want to visit Pariaman because their area is located in the highlands, so to see the beach and travel with different ecological concepts such as tracking mangroves is something that is fun for them.

In the third zone the cities and regencies that entered were Payakumbuh City (1%), South Solok Regency (1%) and Pekanbaru City (1%). These three cities are grouped into areas that have access far enough from the mangrove area. The results of interviews with visitors from these three areas they traveled to

tracking mangroves did not make the visit the main objective. They went to Pariaman with the aim of visiting Gandoriah Beach or where their relatives were having an event. When

they found out that there was a tour with the concept of tracking mangrove forests, they wanted to stop by in Apar Village.

Table 2 The number of visitors and the cost of visiting by city/regency

Zone	Number of visitors	visit fee (Rp.)	Percentage
Zona I			
- Kota Pariaman	17	728.253,42	21%
- Kab. Padang Pariaman	39	1.430.863,01	49%
- Kota Padang	16	713.835,62	20%
Total Zona I	72	2.872.952,05	90%
Zona II			
- Kota Padang Panjang	2	84.938,35	3%
- Kota Batusangkar	1	41.013,7	1%
- Kota Bukittinggi	2	146.664,38	3%
Total Zona II	5	272.616,43	7%
Zona III			
- Kota Payakumbuh	1	57.191,78	1%
- Kab. Solok Selatan	1	152.465,75	1%
- Kota Pekanbaru	1	259.109,59	1%
Total Zone III	3	468.767,12	3%
Total Zone I, II dan III	80	3.614.335,60	100%

Mangrove tracking tourism in Apar Village has changed the activities of several people in their daily lives, including many people selling in tourist areas, they sell along the beach near the mangrove area. This certainly provides economic benefits to residents, but residents must also play a role in maintaining tourism activities so that they develop more. In accordance with [Damanik and Weber \(2006\)](#) which state that the surrounding community, especially the indigenous people who live in tourist areas, is one of the key players in tourism so that the readiness of the community to be involved in ecotourism development is very much needed.

To maintain visitor satisfaction in the ecotourism area, several aspects need to be considered, namely strict tourism management, currently there is no entrance ticket fee for visiting the mangrove tracking area, visitors are only charged vehicle parking fees, but the surrounding community still asks for unequal parking fees. This is trivial, but can give a bad image to mangrove tracking tourism which makes visitors uncomfortable. [Ayop \(2009\)](#) in [Pangastuti \(2016\)](#) said that to get the level of satisfaction of tourist visitors,

the comfort and safety of visitors must be guaranteed.



Figure 3 Several mangrove tourism points in Apar Village

CONCLUSION

The results of the calculation of the economic value of mangrove ecotourism in Apar Village covering an area of 10.62 hectares in Apar Village is Rp. 3,614,335.60 per year or Rp. 340,332.92 per Ha per year. Found eight plant species such as: Kurap mangroves (*Rhizophora mucronata*), mangroves (*Rhizophora apiculate*), Nipah (*Nypa Fructicans*), Jeruju (*Dolichandrone spathacea*),

Pinago (*Calophyllum inophyllum*), Nibuang (*Oncosperma tigillarum*), Pidada (*Sonneratia caseolaris*), *Acanthus ilicifolius*.

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Author's declaration

Authors' contributions and responsibilities

The authors made substantial contributions to the conception and design of the study. The authors took responsibility for data analysis, interpretation and discussion of results. The authors read and approved the final manuscript.

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Availability of data and materials

All data are available from the authors.

Competing interests

The authors declare no competing interest.

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