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Environmental valuation of raya lati petangis park using the travel cost method in Paser District, East Kalimantan

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ABSTRACT

The Lati Petangis Forest Park is a forest area that was previously a mining concession area of PT BHP Kendilo Coal which has ended its operations and was later developed into a tourism area. The purpose of this study was to determine the aspects that influence the level of visits to the Lati Petangis Grand Forest Park, Paser Regency, East Kalimantan and to analyze the Willingness to Pay (WTP) value of the Lati Petangis Grand Forest Park. The method used is the Travel Cost Method and Consumer Surplus. The results of the calculation of the environmental valuation of Nature Tourism Forest Park Raya Lati Petangis, Batu Engau District, Paser Regency, East Kalimantan using the Travel Cost Method can be concluded that the average WTP value is known to be Rp. 247,959, so that the economic value of the Lati Petangis Grand Forest Park is Rp. Rp. 725,614,497.06 per year, the consumer surplus value is Rp. Rp. 1,820,671,342.3. From the regression analysis it was found that the independent variables in the form of travel costs (X1), Age (X2), Education (X3), Income Level (X4), Cleanliness Quality (X5), and Visitor Satisfaction Level (X6) have a significant effect on the economic value of Tahura Lati Petangis which can be characterized by the high number of visits.

Keywords: lati petangis forest park; travel cost method; east kalimantan.

INTRODUCTION

Indonesia has been known as one of the countries in the world that has mega biodiversity due to the existence of various kinds of animals and plants as well as the uniqueness of biological wealth spread from Sabang to Merauke which is not owned by other countries such as mountainous scenery such as on the islands of Sumatra, Java, Bali to Nusa Tenggara. , large rivers on the island of Borneo, waterfalls to artificial natural beauty such as rice fields and fields (Bappenas, 2016 in Sukwika & Kasih, 2020). So that the economic potential that exists in mini natural resources can be developed to become one of the options in boosting the economy of society and the country. Law Number 5 of 1990 clearly states that Nature Tourism Parks are nature conservation areas, used for nature tourism and recreation. In Law Number 32 of 2009 concerning Environmental Protection and Management, environmental economic issues have been included in the form of instruments that can be used as tools for formulating economic policies so that all stakeholders, especially decision makers, can run the wheel of development while continuing to strive for environmental sustainability. The application of these instruments is then regulated in Government Regulation of the Republic of Indonesia Number 46 of 2017 concerning Environmental Economic Instruments. This Government Regulation outlines that the implementation of development and economic planning and activities includes the fields of natural resource management, spatial planning, conservation and preservation of natural resources and the environment. So that the regulation has implied a relationship between economic valuation and natural resources.

In obtaining goods and services originating from natural resources, humans can obtain them directly or indirectly (Dwijayanti et al., 2015; Chen and Jim, 2015), for example environmental services in the form of fresh air, beautiful scenery, clean river water. clean and many others, all of which can provide benefits to humans (Leh et al, 2018). However, this environmental service is something that does not have a direct financial price or does not have environmental output, so it is necessary to calculate something that does not have a direct market value or has not clearly stated its economic value (Putri, 2020). The economic value and tangible and intangible benefit value of natural resources such as the Tahura Lati Petangis area in the form of vegetation and fauna cover can be

calculated or evaluated economically so that it can provide added value in terms of ecological, social and economic benefits for Paser Regency in particular public.

The Lati Petangis Forest Park (LPFP) is a forest area that was previously the mining concession area of PT BHP Kendilo Coal which has ended its operations. Geographically, Tahura Lati Petangis has an area of 3,445.37 Ha, which is at 116°3'40.996"E-116°6'21.502"E and between 2°2'30.786"S - 2°9'24.983"S. Administratively, the Tahura Lati Petangis area is included in the administration of Batu Engau District, Paser Regency. The several legal bases for determining Tahura Lati Petangis are as follows:

a. Decree of the Minister of Forestry of the Republic of Indonesia Number SK.141/Menhut-II/2013 concerning Designation of Areas for Other Uses as Forest Areas with the function of the Lati Petangis Forest Park covering an area of ± 3,964 Ha located in Batu Engau District, Paser Regency, East Kalimantan Province in March 4, 2013.
b. Decree of the Minister of Environment and Forestry Number: SK.4335/MenLHK-PKTL/KUH/2015 concerning Designation of Forest Areas for the Lati Petangis Grand Forest Park covering an area of 3,445.37 ha in Paser Regency, East Kalimantan Province.
c. Decree of the Director General of Forest Protection and Nature Conservation of the Ministry of Environment and Forestry of the Republic of Indonesia Number: SK.345\KSDAE/SET/KSA.0/9/2018 dated 6 September 2018 concerning the Management Block of the Lati Petangis Grand Forest Park, Paser Regency, East Kalimantan Province.

Most of it, namely around 63.59% of the Tahura Lati Petangis management area, is located in the administrative area of Saing Prupuk Village. Saing Prupuk Village is a division of Petangis Village, while Tebru Paser Damai Village is a division of Kerang Village. Land cover is a major concern (Munawir et al., 2019; Rusdiyanto et al., 2020), the area of the Tahura Lati Petangis forest park is further divided by 64.07% in the form of forest, which consists of dry land forest, while the remaining 35 93% is non-forest area. There are several parts of this Tahura area that are experiencing physical disturbances related to the existence of policies that were in force in the past and due to the current social conditions of the community. The problem that arises is that the community has lived before the establishment of this area as a Tahura where the area is used for the practice of cultivating oil palm, various kinds of fruits as well as secondary crops and paddy fields. Basically oil palm (Elaeis hguineensis Jacq.) is an obstacle to the post-mining succession process, and even in some parts of the area it leads to deforestation.

The matters that are of particular concern to this area so that it continues to run on an ongoing basis include biological conservation and hydrological protection, understanding and support between related parties, benefits in the field of research, science and natural tourism potential, efforts to maintain habitats, area security measures. So this study aims to determine the aspects that influence the level of visits to the Lati Petangis Grand Forest Park and analyze the Willingness to Pay (WTP) value of the Lati Petangis Grand Forest Park, Paser Regency, East Kalimantan.

RESEACRH METHODS

The research method used in this study is a survey method. This research was conducted at the Tahura Lati Petangis Forest Park, Batu Engau District, Paser Regency, East Kalimantan. This location was chosen purposively. The time for data collection was carried out from May 28 to November 2022. The data collection process was taken tending to the holiday season and weekends (peak season). The population in this study were visitors to the Tahura Lati Petangis tourist park who did recreation. The population in this study is not known with certainty, so the sampling refers to the opinion of Suparmoko (1999), namely the research sample includes a number of respondents who are greater than the minimum requirement of 30 respondents. So that the number of samples in this study were 35 respondents. The economic valuation of Tahura Lati Petangis will be analyzed using the Travel Cost Analysis (TCM) approach, which bases the assessment on the willingness to pay (WTP) of respondents to the Tahura Lati Petangis Forest. The economic value of Tahura Lati Petangis using TCM is the total consumer surplus value, namely the consumer surplus multiplied by the study population. The analysis model for determining the demand function for visiting Tahura

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Lati Petangis will use an econometric technique, namely simple regression (Ordinary Least Square/OLS). Quoted from Putri (2020), the request function can be described as follows :

Qi = f (TC, X1,X2,…..,Xn)

Where:
Qi = Total visit of person i to location j
TC = Travel expense
Xn = Socioeconomic Variables

Furthermore, in carrying out the Travel Cost Method analysis, it begins by calculating the average value of the WTP which will determine the economic value based on travel costs. Then describe the demand curve to determine the consumer surplus results from the regression graph obtained between the number of visits and the average WTP of tourist objects (Armadinata & Pharmawati, 2019).

RESULT AND DISCUSSION

Lati Petangis Forest Park

Lati Petangis Grand Forest Park is a natural tourism that can be evaluated using the Travel Cost Method (TCM). The costs incurred to access this Tahura location can be calculated to obtain the economic value of a tourist object, in this case natural tourism. The results of descriptive statistical analysis before calculating TCM and consumer surplus based on survey results with 35 (thirty five) respondents, can be shown in Figure 1.

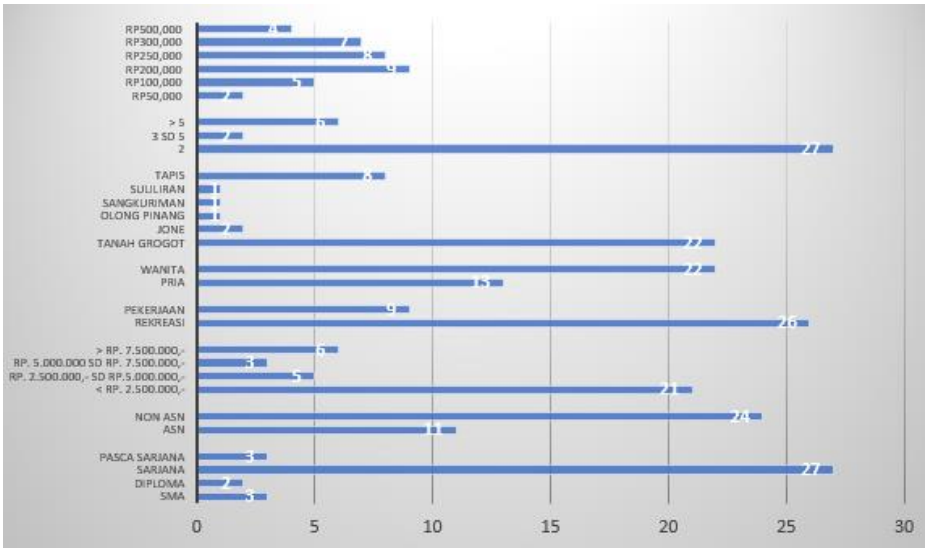

Figure 1. Information on Visitor Characteristics of LPFP

Based on the results of Figure 1, the comparison of the number of respondents to the environmental valuation of Tahura Lati Petangis Nature Tourism was dominated by women as many as 22 people compared to men around 13 people. Woman. The age level of the respondents varied from respondents who were 22 years old to respondents who were 58 years old. The age level of respondents in the Environmental Valuation of Nature Tourism Tahura Lati Petangis with the most age is in the distribution of productive age, namely 18-50 years, namely 33 people, while the respondents with the least age are in the distribution of post-productive age, namely more than 50 years, totaling 2 people. The majority of respondents practicing Environmental Valuation of Tahura Lati Petangis Nature Tourism Using the Travel Cost Method Approach live in Tanah Grogot which is the administrative center of Paser Regency, The existence of Tahura Lati Petangis Nature Tourism is the closest alternative to releasing boredom after a week of work with easy and inexpensive access. Tahura Lati Crying. Even though in the vicinity of Lati Petangis there are several nearby sub-districts such as Pasir Belengkong District and Tanjung Harapan District, their

residents are not yet interested in traveling to Lati Petangis because the conditions where they live are more or less the same as Tahura Lati Petangis, have a fairly high vegetation density and there are lakes. small lake around which they live. The level of education of the respondents varied greatly, ranging from respondents who graduated from high school (SMA) to respondents who graduated from postgraduate (S2). Respondents with the highest level of education were graduates of Higher Education (PT) totaling 27 people, while respondents with the least level of education were Diploma graduates, namely 3 people. As for other respondents, namely respondents who graduated from high school (SMA) and postgraduate (S2), each numbered 3 people. In general, the frequency of visits by respondents was twice, only a few visited more than 3 (three) times. The level of income per month of the respondents also varied greatly, ranging from respondents who had an income of less than IDR 2,500,000 per month to respondents who had an income of more than IDR 7,500,000 per month. Respondents with the most income levels had incomes of less than Rp. 2,500,000 per month totaling 27 people, while respondents with the lowest incomes had incomes between Rp. 5,000,000 to 7,500,000 per month, only 3 people. The respondents who have an income of IDR 2,500,000- IDR 5,000,000 per month are 5 people and more than IDR. 7,500,000, - as many as 6 people.

The results of the analysis of several respondents regarding visitor responses in Figure 3, show that the majority of visitors have a response that the view of Tahura Lati Petangis is interesting, then it is quite interesting. The interest of visitors is probably due to the lakes in this area. The lake with the name Gentung Dayo is a void location for the coal mine of PT BHP (Broken Hill Proprietary) Kendilo Coal. It is especially suitable for those who need a "healing environment" or just "selfie fun". The condition of supporting facilities in Tahura Lati Petangis generally still needs improvement, although the majority consider it to be quite good, those who consider the supporting facilities are still very poor or even not good. For example, several facilities such as houses of worship, gazebos and toilets have been damaged and not maintained. To reach Tahura Lati Petangis is actually very easy because the road facilities are classified as very good due to routine maintenance carried out by the Central Government due to the status of a State Road, however what still needs to be improved is the road from the gate to the point of interest, namely Gentung Dayo and its surroundings. Access roads on this route are often used by other users such as mobilizing construction activities and other economic activities such as small-scale coal mining.

Figure 2. Condition of Lake Genteng Dayo Tahura Lati Petangis (2022)

Garbage facilities are also a matter that the respondents complained about. Although there are those who think it is sufficient, many consider temporary landfills to be very lacking or even not good so that it reduces the aesthetics of the area itself. Even though there is still a lot that needs to be fixed, most visitors feel quite satisfied and some are even satisfied after visiting Tahura Lati Petangis, especially those who like to venture into open nature such as forests and mountains. However, those who are not fans of natural tourism may be dissatisfied with the lack of management of this natural tourism location.

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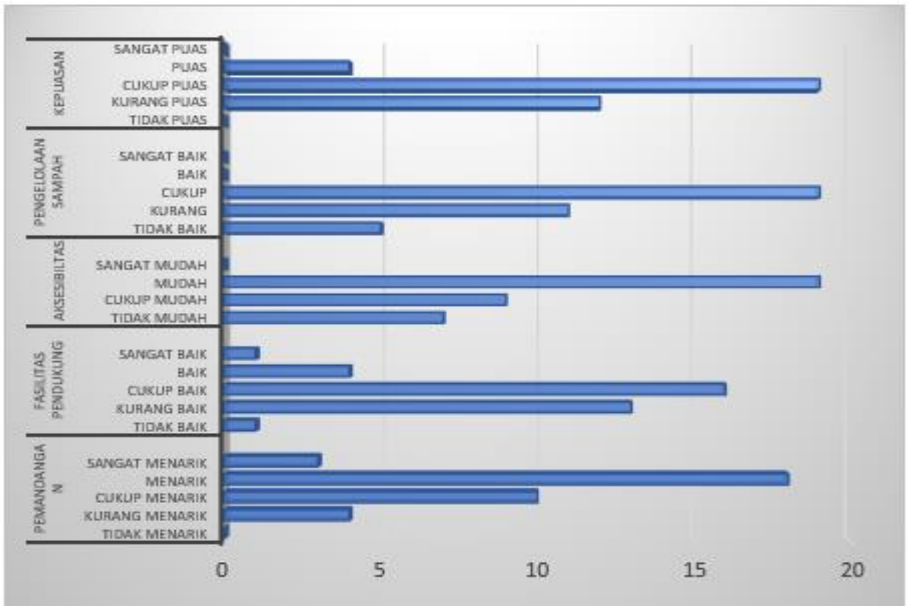

Figure 3. Visitor Responses

Travel Cost Method (TCM)

This study raises as many as six independent variables to analyze the level of influence on one dependent variable in the form of the frequency of tourist visits to the Forest Nature Tourism Raya Tahura Lati Petangis in the past year. The five independent variables in this study include: travel costs (X1), age (X2), education (X3), income (X4), quality of cleanliness (X5), and satisfaction (X6).

Table 1. Results of Regression Analysis of Environmental Valuation of LPFP

Regression Statistics					
Multiple R				0.901455443	
R Square				0.812621916	
Adjusted R Square				0.772469469	
Standard Error				0.738967708	
Observations				35	
	df	*SS*	*MS*	*F*	*Significance F*
Regression	6	66.30994835	11.05165806	20.23841598	5.37476E-09
Residual	28	15.29005165	0.546073273		
Total	34	81.6			

	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	3.108378616	1.986231481	1.564962918	0.128824765
Total Cost (X1) of the Trip	2.63749E-06	2.75144E-07	9.585851611	2.42804E-10
Age (X2)	0.025928063	0.018250439	1.42068159	0.166450426
Education (X3)	-0.184473465	0.109719745	-1.681315107	0.10382464
Income (X4)	-6.69529E-09	4.87025E-09	-1.374730539	0.180117666
Hygiene Quality (X5)	0.262207953	0.254438257	1.030536666	0.31157823
Satisfaction (X6)	-0.114956684	0.263437821	-0.436371221	0.665913814

The higher the value of R2 means the better the predictive model of an analysis. According to Chin (1998), the R-square value is categorized as strong if it is more than 0.67, moderate if it is more than 0.33 but lower than 0.67, while it is considered weak if it is more than 0.19 but less than 0.33. From the results of the regression analysis of the relationship between the variables in the environmental valuation calculation of Tahura Lati Petangis, an R-square of 0.813 is obtained, this shows that all independent variables simultaneously have an influence of 81.3% on the number of natural tourism visits in Tahura Lati Petangis and the remaining 18.7% influenced by other variables not tested in this study. Another variable according to Nugraha et al (2013) is the importance of the carrying capacity of the area so that environmental degradation does not occur or excessive damage to the carrying capacity of the natural tourism environment. This was confirmed by Yulisa et al. (2016) that the carrying capacity of the environment and land suitability greatly support the development of tourist areas, as well as the opinion of Suswantoro (2004) that the suitability of ecotourism with its natural beauty can add to the attraction to encourage tourists to come for a tour.

To determine consumer surplus in this study using regression analysis (Raharjo, 2018; Reimann, 2008). Regression analysis was used to determine the factors that influence the frequency of tourist visits to the Lati Petangis Grand Forest Park. The frequency of visits is measured in units of visits. The model from the results of the regression analysis is obtained as follows:

$$y = 3.10838 + 0.00000263749X1 + 0.02593X2 - 0.1835X3 - 6.695X4 + 0.2622X5 - 0.11496X6$$

Based on the equation of the results of the regression analysis, a travel cost demand curve can be constructed. Furthermore, by using the demand curve, the economic value of tourism can be determined through the calculation of consumer surplus (SK). The average travel cost as mentioned above is Rp. 247,959 which is calculated based on the average cost incurred by respondents per visit with the equation y = a – bx, where a is the intercept value while b is the travel cost coefficient.

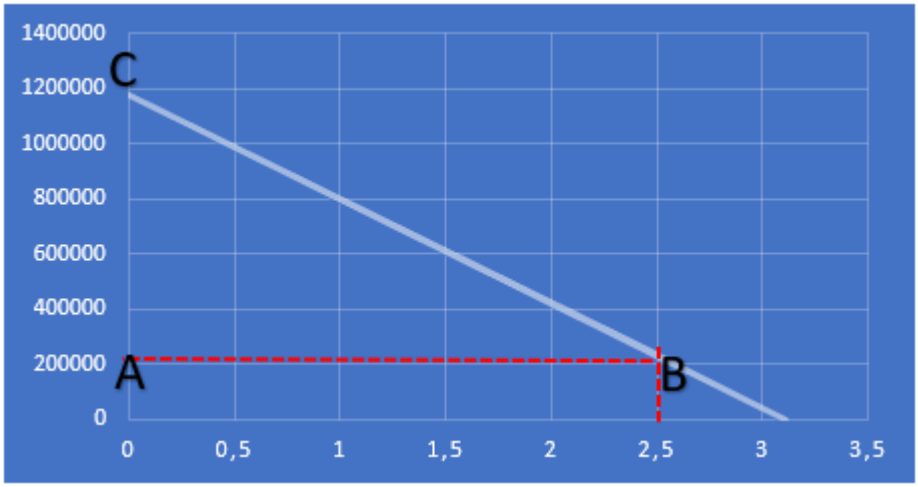

Figure 4. Travel Cost Demand Curve for Tahura Lati Petangis Tourism

Figure 8. shows a collection of observations about travel costs and the number of visits (trips). If line AB is the travel cost paid by individuals, then consumer surplus is equal to triangle ABC. The travel cost curve can be expanded to include various explanatory variables such as age, education level, opinion level, cleaning quality and respondent satisfaction level.

From the results of the regression analysis in the table above, we can determine the value of consumer surplus using the equation:

Consumer Surplus = Number of Visits^2 / (2 x Travel Cost Coefficient)

So that the calculation results are obtained :

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Table 2. Results of Analysis of the Total Economic Value of Natural THLP

Number of Respondents (a)	35
Number of visits by respondents (b)	98
Number of visits in 2021 (c)	1.367
Travel cost coefficient (d)	0.00000263749
Consumer surplus ($e = b^2/2d$)	Rp. 1.820.671.342,3
Consumer/individual/visit surplus (f = e/a/b)	Rp. 530.807,97
Economic Value (g = f x c)	Rp. 725.614.497,06

According to the results shown in table 2, the total economic value of the Lati Petangis Forest Park is the number of visits of 1,367 visitors per year. Meanwhile, the consumer surplus per individual per visit is IDR 530,807. The consumer surplus obtained by Wisata Alam Tahura Lati Petangis over the past year can be estimated at IDR 725,614,497.-. Nature Tourism Taman Hutan Raya Lati Petangis has a large consumer surplus value and economic value. The consumer surplus is large when compared to the average travel cost. Meanwhile, the economic value is large when compared to actual revenue, namely the number of individual consumers per visit and the total number of visits in a year. These results prove that the Nature Tourism Forest Raya Lati Petangis really deserves to be preserved and still has the potential to be developed better, especially efforts to improve various facilities, improve services, and renew other components that support the development of Nature Tourism.

CONCLUSION

The calculation of the environmental valuation of Nature Tourism Forest Park Raya Lati Petangis, Batu Engau District, Paser Regency, East Kalimantan uses an average Travel Cost Method value of Rp. 247,959, so that the economic value of the Lati Petangis Grand Forest Park is Rp. Rp. 725,614,497.06 per year, the consumer surplus value is Rp. Rp. 1,820,671,342, -. From the regression analysis it was found that the independent variables in the form of travel costs (X1), Age (X2), Education (X3), Income Level (X4), Quality of Cleaning (X5), and Visitor Satisfaction Level (X6) have a significant effect on economic value Tahura Lati Petangis which can be characterized by the high number of visits. To increase the number of visits, the suggestions we can give are: 1). Improving supporting facilities and infrastructure such as access roads to the Lati Petangis Tahura location, the quality of cleanliness of tourist sites and existing facilities such as prayer facilities, toilets, parking and others, 2). Maximize the use of the proceeds from paying the price for entering the location so that it can increase the economic value of the Lati Petangis Grand Forest Park location.

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