



UDC 332

**ANALYSIS OF VISITORS' WILLINGNESS TO PAY FOR THE KERANDANGAN NATURE
TOURISM PARK ECOTOURISM, LOMBOK, WEST NUSA TENGGARA PROVINCE,
INDONESIA**

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ABSTRACT

The Kerandangan Nature Tourism Park (KNTP), as a conservation area, provides various ecosystem services that do not have direct market value or are intangible. These ecosystem services include benefits in climate regulation, soil protection, water purification, and habitat for biodiversity. Besides that, the KNTP has many tourist attractions, such as the biophysical potential presented in the form of waterfalls, rivers, camping ground and various flora and fauna. KNTP management has planned the development of sustainable natural tourism. The development of natural tourism that ignores the area's function as a conservation area has the potential to cause environmental degradation. Therefore, it is necessary to assess natural resources and intangible environmental services using the Willingness to Pay (WTP) and consumer surplus. The aim of this research is to measure the economic value of natural tourism environmental services in KNTP based on visitors' willingness to pay (WTP) and consumer surplus value. The approach used in this research is the travel cost approach. This approach uses travel costs to estimate the value of WTP and consumer surplus. The research results show that the average WTP value is IDR 13,300 and the consumer surplus value is IDR 171,232 per visit. The WTP value obtained is much smaller than the consumer surplus value. This shows that ticket prices for natural tourism at TWA Kerandangan can still be increased. Willingness of visitors to pay compensation costs, prevent damage to the tourist environment, support conservation and the quality of ecosystem environmental services.

KEY WORDS

Consumer surplus, ecosystem services, economic value, nature tourism park.

Utilization of natural resources by developing the tourism industry critically significant have a positive impact economically, socially and environment. The tourism industry is one of the third largest foreign exchange contributing sectors with a contribution of 4.34% to Gross Domestic Product in 2018 – 2022. The Indonesian Ministry of Tourism and Creative Economy has designated Lombok as one of the national priority tourist destinations. This is supported by natural charm and beautiful views of hills and beaches (Ministry of Tourism and Creative Economy Indonesia, 2022). The tourism industry on Lombok Island is positively correlated with an increase in Regional Original Income. Regional Original Income from the tourism sector comes from payments of taxes and levies. Taxes and levies are closely related to the number of visits and number of hotels (Febria, et al 2024; Suwarni, Nuhung, & Mutmainnah, 2024).

The natural disaster of the earthquake in 2018 and the Covid-19 pandemic in 2019 have caused the number of tourist visits to NTB to reach a low point, showing a visit figure of 400,595 people. Then, the number of tourist visits slowly recovered and in 2022 there was a significant increase in the number of tourists to 1,376,295 (Tourism Department, 2023). This



shows that West Nusa Tenggara Province is a destination of choice for tourists providing opportunities to increase Regional Original Income.

Kerandangan Nature Tourism Park is located in the Senggigi Tourism Village, the Senggigi area has been designated as a strategic area for economic development with a leading tourism sector (West Lombok Regency Government, 2011). Kerandangan Nature Tourism Park, namely the Natural Resources Conservation Center in Nusa Tenggara Province, has prepared a plan for the development of sustainable natural tourism (Natural Resources Conservation Center, West Nusa Tenggara, 2008). The concept of sustainable tourism has emerged with the main aim of reducing the negative impacts of tourism activities. Sustainability includes all elements of tourism (Zolfani et al, 2015).

The Kerandangan Nature Tourism Park has natural potential with high biodiversity of flora and fauna. Natural potential is positively related to tourism activities. Research has found that areas with high-quality natural environments and biodiversity offer many benefits to humans, including utility value and indirect benefit value (Ritonga, 2023; Marcouiller, Kim, & Deller, 2004).

Natural potential plays an important role in increasing the overall value and attractiveness of natural tourism destinations (Zhang & Xu, 2020; Wang, Xia, Chen, & Yuan, 2008). On the other hand, the beneficial value of natural potential is intangible and is often overlooked in calculating the value of natural resources (Fauzy, 2010). This often leads to excessive and potentially destructive use of natural resources. This problem arises because traditional economic assessments tend to focus on tangible and market-based benefits, and ignore non-market benefits and intangible benefits.

One of strategy to be implemented in anticipating environmental degradation due to natural tourism activities is to provide value to the benefits of intangible natural resources. Intangible natural resources can be assessed using the Willingness To Pay (WTP) approach. KNTP can be used to measure the economic value of natural resource benefits that do not have direct market value, such as scenic beauty, biodiversity, or ecosystem function. WTP indicates the maximum price consumers are willing to pay for a particular product or set of products, and influences consumer choice behavior. In otherhand, KNTP shows the maximum price of an individual's willingness to pay for a service or consumption of a particular product (Biswas, 2016). The aim of this research is to determine the economic value of natural tourism environmental services in KNTP based on visitors' willingness to pay and the value of consumer surplus. The WTP and consumer surplus values are useful for determining ticket prices in accordance with the value of environmental services used by visitors.

METHODS OF RESEARCH

KNTP management is the authority of the Conservation and Natural Resources Agency in West Nusa Tenggara Province. The Kerandangan Forest area was officially designated as a Nature Tourism Park in 1992.

The Kerandangan KNTP area is in Kerandangan Hamlet, Senggigi Village, West Lombok. In the north, east and south it borders the Rinjani protected forest. To the west it borders Mangsit Hamlet, Senggigi Village (Figure 1). The astronomical position of KNTP Kerandangan is at latitude $8^{\circ} 28' 06.6''$ - $8^{\circ} 29' 15.6''$ South Latitude and $116^{\circ} 02' 36.4''$ - $116^{\circ} 04' 03.4''$ East Longitude. TWA Kerandangan is about 18 km from Mataram City, and about 52 KM from Lombok International Airport.

The KNTP Kerandangan area is a seasonal forest area which is home to various species of flora and fauna typical of the islands of Lombok and Nusa Tenggara. Natural views in the form of hills, valleys and waterfalls as well as a variety of flora and fauna are the attraction of KNTP Kerandangan as a natural forest tourism destination (Wahyuni & Mildranaya, 2010). In the 2010-2014 period, namely before the natural disaster of the earthquake that hit Lombok Island, tourist visits to KNTP Kerandangan showed an increasing trend of around 33% (Farista & Virgota, 2019).



Figure 1 – Map of research location

The method used in this research is non-probability sampling. The sampling technique was carried out on groups who were willing to participate. This method does not involve a random selection process and is used when researchers meet participants by chance (Obilor, 2023). When the research was conducted, the number of visitors during the research was at most 150 people. Of the 150 people, only 70 people were willing to be respondents.

The approach used in this research is the Individual Travel Cost Approach (ITCA). The ITCA approach uses travel costs as a proxy for assessing visitors' willingness to pay for natural tourism environmental services (Lupiyanto et al., 2023; Rajkumar & Boopathi, 2022). This approach assumes that the costs incurred to visit a tourist location reflect the minimum value provided visitors to the recreational experience at that location.

The WTP assessment using the travel cost approach is carried out in several stages. The first stage is regression analysis to determine the demand function for Kerandangan KNTP. Regression analysis is based on the dependent variable Number of visits (Y) and travel costs (X1), Distance (X2), Income (X3), Travel Time (X4) and Education (X5) as independent variables. The operational definition of research variables can be seen in Table 1. The form of function is as follows:

$$Y = f (X1, X2, X3, X4, X5)$$

Where: Y = Number of visits; X1 = Travel expense; X2 = Distance; X3 = Income; X4 = Travel time; X5 = Education.

Table 1 – Operational Definition of Research Variables

Variable	Information
Number of visits (Y)	Frequency of arrival of respondents in KNTP Kerandangan. Measured in units of amount in the last 1 year
Travel costs (X1)	The amount of money spent by respondents when visiting KNTP Kerandangan. Measured in rupiah units
Distance (X2)	distance from the respondent's house to KNTP Kerandangan. Measured in kilometers
Revenue (X3)	money the respondent receives from his work (for those who already work) or money he receives from his parents (for those who do not work). Measured in rupiah per month
Travel time (X4)	Travel time from the respondent's house to KNTP Kerandangan. Measured in hours
Education (X5)	The level of education completed by the respondent. Measured using a Likert scale in 4 levels/categories

The second stage, calculates the consumer surplus enjoyed by visitors at KNTP Kerandangan based on the tourist attraction demand function.



To find consumer surplus per individual per year, an integral calculation is used with the upper limit being the highest travel cost and the lower limit being the lowest travel cost. The third stage, analysis of willingness to pay (WTP). The value of visitors' willingness and ability to pay for the environmental benefits they perceive can be calculated by calculating the estimated average WTP. The average value of WTP by respondents who are willing to pay is calculated using the following equation:

$$EWTP = (\sum_{i=1}^n Wi)/n$$

Where: EWTP = average visitor WTP value; Wi = The amount of WTP that is willing to be paid; i = Visitors who are willing to pay; n = Number of respondents.

RESULTS AND DISCUSSION

The respondents in this research were 70 KNTP Kerandangan visitors who were willing to fill out the questionnaire, and all respondents came from around Lombok Island. Visitors to KNTP Kerandangan visited on average 2.19 times. For each visit, the average cost incurred by visitors is IDR 58,071. This fee includes entrance tickets, travel costs and consumption. The average distance between visitors' residences and TWA Kerandangan is 26.5 kilometers. The closest distance is approximately 1 kilometer, and the farthest distance is 73 kilometers. This shows that visitors to KNTP Kerandangan are local people from Lombok Island. Respondents' income shows large variations. Especially for students whose income is usually proxied by the pocket money they receive from their parents. Minimum income IDR 100,000 and maximum income IDR 5,000,000. The average income in this study was IDR 1,350,714. Visitor education is categorized into 4 levels, namely 1. Elementary school; 2. Middle School; 3. High school; and 4. Higher Education. The average visitor education is 3, which indicates that the average visitor has a high school education. The statistical description of respondents can be seen in Table 2.

Table 2 – Description of respondents

	N	Minimum	Maximum	Mean	Std. Deviation
Travel expense	70	15000	200000	58071.43	42,828.381
Distance	70	1.00	73.00	265.914	20,27609
Income	70	10000	5000000	1343571.43	1274411,527
Travel time	70	5.00	130.00	459.286	34,17233
Education	70	1	4	3.10	801
Number of Visits	70	1	4	2.19	1,207
Valid N (list)	70				

Source: Data processing, 2024.

Regression analysis is intended to determine the demand function for natural tourism in KNTP Kerandangan. Regression analysis can reveal factors related to demand for natural tourism in KNTP Kerandangan, namely travel cost (X1), distance (X2), income (X3), travel time (X4) and education (X5). Regression analysis includes the presentation of classical assumption tests, and the results of the regression relationship between the independent variable (X) and the dependent variable (Y).

The classical assumption test is carried out by the normality test. The regression model is said to be normally distributed if the plotting data (dots) that depict the actual data follow a diagonal line (Ghozali, 2011). The normality test results show that the regression model has a normal distribution, which can be seen in Figure 1.

The Simultaneous F Test based on the significance value concluded that X1, X2, X3, Gazali (2011) states that if the Sig value is <0.05 then variable X simultaneously influences the Y value. The significance value can be seen in the ANOVA table (Table 3).

Apart from that, the simultaneous influence of Variable X on the Y value can be seen from the F value of 2,421 and the F table value (5.65) of 2.36. According to Sujarweni (2014)



if the calculated F value > F table then it means that the independent variable (X) has an effect on the dependent variable (Y).

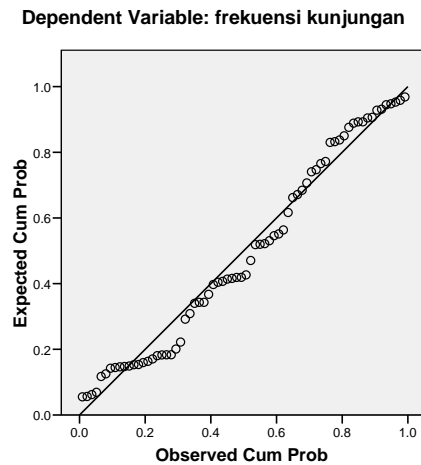


Figure 1 – Normality Test (Normal Probability Plot)

Table 3 – Anova showing significance values

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.999	5	3.200	2.421	.045(a)
	Residual	84.587	64	1.322		
	Total	100.586	69			

a. Predictors (Constant): Education, Travel time, Income, Travel costs, Distance.
 b. Dependent Variable: Frequency of Visits.
 Source: data processing, 2024.

The multiple regression equation obtained is as follows:

$$Y = 2.032 - 0.00000157 X_1 + 0.007 X_2 + 0.00000022 X_3 - 0.017 X_4 + 0.165 X_5$$

Table 4 – Regression Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	sig	Collinearity Statistics	
	B	Std. Error	Beta	Tolerance	VIF	B	Std. Error
(Constant)	2,302	.571		3.559	.001		
Travel expense	-0.00000157	.000	-.056	-.321	.749	.436	2.294
Distance	.007	.045	.126	.168	.867	.023	42.669
Income	0.00000022	.000	.232	1.829	.072	.814	1.229
Travel time	-.17	.026	-.470	-.642	.523	.024	40.842
Education	.165	.186	.110	.890	.377	.863	1.159

Source: Data processing, 2024.

Based on the regression equation obtained, it is known that variables X2 (distance), X3 (income), and X5 (education) have a positive influence on the Y value (frequency of visits). The visit frequency value is used to estimate the value of visitors' willingness to pay for tickets (Laksmana, 2022). The regression coefficient from the analysis results can be seen in Table 4.

The variables distance, income and education are positive, meaning that increasing the value of distance, income and education will increase the opportunity for willingness to pay. The factors that influence Willingness to pay in this research are in line with research by Sadikin et al. (2017) namely education, income, number of family dependents, activeness in



environmental organizations and knowledge about ecotourism. According to research by Deristani et al. In 2022, factors influencing willingness to pay will be age and income (Deristani & Hidayat, 2022).

WTP is a person's willingness to pay for environmental conditions or natural resources and natural services to improve environmental quality. Willingness to pay (WTP) is an economic value which is defined as the maximum amount a person is willing to donate goods and services to obtain other goods and services (Laksmana, 2022). In the context of natural resource conservation, WTP is often used to measure the economic value of environmental services that do not have a direct market price (Hoang, et al., 2022).

The results of the analysis of visitors' abilities from the questionnaire results show that the average willingness of visitors to pay for tickets (willingness to pay) is IDR 13,300. The minimum willingness to pay for a ticket is IDR 7,000 according to the rate set by the manager. The maximum value of respondents' ability to pay for tickets is 200% of the fare set by management, namely IDR 21,000. A description of respondents' ability to pay for tickets can be seen in Table 5.

Table 5 – Description of ability to pay for tickets

	N	Minimum	Maximum	Mean	Std. Deviation
WTP	70	7000.00	21000.00	133.000.000	5349,65799
Valid N (listwise)	70				

The average WTP value obtained is IDR 13,300, the minimum WTP value is IDR 7,000, the maximum WTP value is IDR 21,000. Tourists who are willing to pay WTP show awareness of the importance of maintaining and preserving tourist areas. This indicates that visitors' understanding is related to environmental quality and the tourist experience they enjoy (Medida & Purnomo, 2021; Hindayani et al., 2024). The large WTP value paid by visitors can be used to develop environmental education programs so as to increase visitor literacy and awareness of the importance of preserving the environment (Octaria et al., 2017).

The WTP concept explains respondents' preferences based on respondents' behavior or preferences and interests, their willingness to pay a certain amount of money for compensation costs, avoid damage or loss of the natural tourism environment, contribute to conservation and environmental quality of ecosystem services. This value determines whether natural resource management in tourism areas is sustainable (Sekar et al., 2014).

The Travel Cost Method (TCM) method is generally used to analyze demand for natural tourism by analyzing the costs incurred by tourists when visiting the tourist area. The basic aim of the TCM method is to determine the use value or price of natural resources with a proxy approach (expenditure patterns) of consumers in the form of costs incurred to consume ecotourism natural resource services within the radius of the number of visits. on independent variables (R. et al., 2009).

Consumer surplus reflects the benefits or added value obtained by consumers from purchasing transactions for a product or service. Consumer surplus occurs when the price consumers pay for a product or service is lower than the price they are willing to pay (Rahayu & Haryati, 2022; Putri et al., 2017). The consumer surplus (CS) value per visitor is calculated using an integral equation with an upper limit for the highest travel costs, namely IDR 200,000 and a lower limit for travel costs IDR 15,000. The upper and lower limit values are obtained from the respondents' questionnaire answers.

The results of calculating the consumer surplus for KNTP visitors obtained a value of IDR 375,000 per year/visitor. Meanwhile, the average visit per year is 2.19 times. So the consumer surplus per individual per visit is IDR 171,232.9 per visit.

Based on the calculation results, the average willingness to pay for visitors is IDR 13,300. Meanwhile, visitors can enjoy KNTP benefits of IDR 375,000 per year or IDR 171,232.9 per visit. KNTP has the potential to provide benefits that are far greater than the visitor's willingness to pay.



CONCLUSION

The results of the analysis show that in this study all independent variables (X), namely travel costs (X1), distance (X2), income (X3), travel time (X4) and education (X5) simultaneously influence the value of the dependent variable Y, namely frequency. visits which are proxied as WTP values. The average WTP value of 70 respondents is IDR 13,300. This means that on average respondents are willing to pay this amount to carry out natural tourism activities at KNTP. This value tends to be low when compared with the value of natural tourism environmental services that can be enjoyed in KNTP (Consumer Surplus), which is IDR 171,232 per visit.

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