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ECONOMIC VALUATION OF MARINE TOURISM BASED ON BIO-ECOREGION (CASE STUDY IN BATUKARAS BEACH, PANGANDARAN DISTRICT, WEST JAVA PROVINCE, INDONESIA)

VALUASI EKONOMI WISATA BAHARI BERDASARKAN KONDISI BIO-EKOREGION (STUDI KASUS DI PANTAI BATUKARAS, KABUPATEN PANGANDARAN, PROVINSI JAWA BARAT, INDONESIA)

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ABSTRACT

The COVID-19 pandemic has an impact on all economic sectors and the order of life in society, including the marine tourism sector. As in the Batukaras Beach tourism area, West Java Province. This research aims to analyze the factors that influence the level of tourist visits marine tourism area of Batukaras Beach and the economic value of marine tourism. The research conducted in May 2021 – June 2022. The data used primary and secondary data, using purposive sampling as many as 106 respondents using multiple linear regression and travel cost method. Based on the results of the research, the factors that influence marine tourism visits are variables X_1 natural conditions of marine tourism, X_2 types of marine tourism attractions, X_3 distance traveled, X_4 length of time for tourism activities, X_5 level of education, X_6 income level, X_7 age, X_8 travel cost. Based on this research it was obtained economic value of the marine tourism environment based on travel expenses in Batukaras Beach is IDR 79,795,000. Consumer surplus or tourists' willingness to pay based on the individual travel cost method is IDR 2,975.08/individual/visiting and economic value of marine tourism based on willingness to pay in Batukaras Beach IDR 1,039,130,027.

Keywords: coastal areas, marine tourism, tourist attractions, travel costs, governance.

ABSTRAK

Pandemi COVID-19 memberikan pengaruh terhadap semua sektor ekonomi dan tatanan kehidupan di masyarakat, termasuk sektor wisata bahari, seperti di kawasan wisata Pantai Batukaras. Penelitian ini bertujuan untuk menganalisis faktor-faktor yang memengaruhi tingkat kunjungan wisatawan di kawasan wisata bahari Pantai Batukaras Kabupaten Pangandaran dan nilai ekonomi aktivitas wisata. Waktu pelaksanaan penelitian Mei 2021 – Juni 2022. Data yang digunakan pada penelitian ini data primer dan data sekunder, dengan tehnik pengambilan responden *purposive sampling* sebanyak 106 responden dengan alat analisis regresi liner berganda dan nilai ekonomi *Travel Cost Method* (TCM). Berdasarkan hasil penelitian faktor yang mempengaruhi kunjungan wisata bahari yaitu variabel X_1 kondisi alam wisata bahari, X_2 jenis atraksi wisata bahari, X_3 jarak tempuh wisatawan, X_4 lama waktu kegiatan wisata, X_5 tingkat pendidikan, X_6 tingkat pendapatan, X_7 usia, X_8 biaya transportasi. Berdasarkan hasil penelitian di lapangan didapatkan nilai ekonomi lingkungan wisata bahari berdasarkan biaya perjalanan wisata di Pantai Batukaras sebesar Rp 79,795,000. Surplus konsumen willingness to pay untuk membayar berdasarkan metode biaya perjalanan individu sebesar Rp 2.975,08/individu/kunjungan dan nilai ekonomi wisata bahari berdasarkan kesediaan membayar di Pantai Batukaras sebesar Rp 1.039.130.027.

Kata kunci: wilayah pesisir, wisata bahari, atraksi wisata, biaya perjalanan wisata, tata kelola.

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INTRODUCTION

Marine tourism is a process involving tourists and the local people, particularly the marine coastal environment and its local wisdom. According to Law No. 10 of 2009 concerning tourism is a travel activity carried out by a person or group of people with the aim of visiting recreational areas for a certain period and is temporary. Meanwhile, nature tourism is a tourism activity that utilizes the potential of natural resources by paying attention to sustainability aspects (Suwantoro 2004; Nurhayati *et al*., 2019). Maritime tourism is all recreational and educational activities whose activities are carried out in coastal areas, bays, surrounding islands, and ocean areas in terms of the surface including those that have artistic value (Nurhayati *et al*., 2019).

The potential for developing marine tourism comes from biological, non-biological, artificial, and environmental services. Biological resources include fish, coral reefs, seagrass beds, mangroves and another marine biota as considering aspects of fisheries and marine resource conservation (Nurhayati *et al*., 2020). Non-biological resources include sand, seawater, seabed minerals. Artificial resources include marine infrastructure related to marine and fisheries, and aquatic environmental services. Maritime tourism is an industry that can be developed as an alternative livelihood for people living in coastal areas can be categorized as an environmentally friendly industry and has recreational and educational benefits for managers, tourists, and the surrounding community. This condition is inversely proportional to the time of the COVID-19 pandemic, where marine tourism business actors diversify their business sector, a result of a decrease in the number of tourist visits.

Referring to the Regional Spatial Plan of West Java Province in 2002, a tourist area is defined as an area that can technically be used for tourism activities and does not interfere with the preservation of culture, natural beauty, and the environment. Furthermore, the area used for tourism activities has the following characteristics: (1) Contribute in increasing national and regional income; (2) Increase foreign exchange and utilize investment; (3) Increase development across sectors and sub-sectors as well as economic activities surrounding; (4) Does not interfere with the protected function, even though tourism activities can take place in the area cover; (5). Does not interfere with efforts to preserve the ability of natural resources; (6) Preserving culture related to efforts to protect, use, and develop objects cultural heritage; (7) Increase income and social welfare of the community. (Development Planning Agency at Sub-National Level West Java Province, 2015).

The COVID-19 pandemic that occurred in 2020 had an impact on all sectors including the marine tourism industry sector, where there was a decline in foreign tourists, domestic tourists, and restrictions for tourist visitors, which was intended to minimize the spread of COVID-19, such as the management of coastal areas for tourism. Marine life on the Batukaras Beach, Pangandaran Regency, West Java Province. The marine tourism industry has linkages with other sectors including resorts, inns, hotels, transportation, micro, small and medium enterprises (MSMEs) that produce souvenirs, culinary delights, travel agents, tour guides, and so on so that a marine tourism

development strategy is needed in the new normal era so that a strategy is needed to maintain the sustainability of the tourism sector (Nurhayati *et al*., 2018).

Economic recovery from the marine tourism sector, namely Government policies are carried out in stages to reduce the spread of COVID-19 by implementing large-scale social restrictions (PSBB) since April 10, 2020 and followed by enforcement of restrictions on community activities (PPKM) as stated in the ministerial instruction Number. 1 of 2021 by the Minister of Home Affairs. The pandemic condition which is gradually returning to normal requires a marine tourism development strategy while still implementing health protocols to prevent the transmission of COVID-19. Marine tourism is included in ecosystem-based and conservation-based natural tourism areas with a low risk of COVID-19, but still should not ignore health protocols, based on the principles of cleanliness, health, safety, comfort, and satisfaction for tourists, so research is needed on the analysis of regional development. Marine tourism in the new normal era case study on the Batukaras Beach, Pangandaran District, West Java Province as an effort to save marine tourism during emergency response, recovery, and normalization.

RESEARCH METHODS

This research was conducted from May 2021 – June 2022 in the Batukaras Beach area, Cijulang District, Pangandaran Regency, West Java Province. The technique of taking respondents in this research is the tourists who visited Batukaras Beach at the time. By using the accidental sampling method as many as 106 respondents. Measuring the degree of accuracy between the data actually happened to the object was tested for validity. The test criteria if the correlation between items with a total score of more than 0.35 then the instrument is declared valid, or vice versa if the correlation between items with a score of less than 0.35 then the instrument is declared invalid. If r count > r table with = 0.05 then the correlation coefficient is significant (Kutner *et al*., 2018; Blackwell, 2007; Himayatullah, 2003; Kling, 1988). To measure the level of accuracy, level of accuracy, stability or consistency in expressing certain symptoms using a reliability test, using the Cronbach's Alpha coefficient method, which is as follows (Manning & Munro, 2006):

$$r_{11} = \frac{k}{(k-1)}\left[1 - \frac{\sum \sigma b^2}{\sigma 1^2}\right] \quad (1)$$

Information:

r_{11}	=	Instrument Reliability
k	=	Number of Questions
$\sum \sigma b^2$	=	Total Item Variance

The reliability test decision criteria are as follows:
If $r_{11} > 0.70$ then the instrument is reliable.
If $r_{11} < 0.70$ then the instrument is not reliable.

The analytical tool used for the factors that influence the development of marine tourism areas in the midst of the COVID-19 pandemic uses multiple linear regression, namely as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots \dots \beta_n X_n \quad (2)$$

Information:
Y = Factors that influence marine tourism visits
X_1 = Natural conditions of marine tourism
X_2 = Types of marine tourism attractions
X_3 = Distance travelled
X_4 = Length of time for tourism activities
X_5 = Level of education
X_6 = Level of income
X_7 = Age
X_8 = Travel cost

According Mehmet & Turker (2006); Ramdas & Mohamed (2014) to find out the significant level of each independent variable regression coefficient (independent variable) on the dependent variable then use statistical tests including t test, F test, and R^2 test. To analyze of the economic value of marine tourism is carried out with the following approach:

$$TCM = TrC + CoC + AcC + Ef \quad (3)$$

Information:
TCM = Travel Cost Method
Tr C = Transportation Cost
CoC = Consumption cost
AcC = Accommodation Cost
Ef = Entrance fee

To find out the environmental economic value of marine tourism objects on Batukaras Beach, Pangandaran Regency with the Travel cost method, the following steps are used:

1. Determine the respondents' average travel costs:

ATC = Respondent's average travel cost
$\sum TTC$ = Total Travel Cost (TTC)
V = The number of tourist respondents

$$ATC = \frac{\sum TTC}{V} \quad (4)$$

2. Determine the economic value of the marine tourism environment based on travel expenses in Batukaras Beach, Pangandaran Regency, namely:

$$EVMT = ATC\ X\ V \quad (5)$$

EVMT = *Economic Valuation Marine Tourism*
ATC = *Average Travel Cost*
V = *Visitor*

Table 1. Estimating the Economic Value in Marine Tourism Based on Willingness to Pay

Variabel
Number of respondents (people) (a) ……..
Number of respondent visits (times/year) (b) ……
Number of tourist visits in 2020 (times) (c) ……..
Travel cost coefficient (d) …….
Total consumer surplus (IDR) (e) ……..
Surplus Consumer/individual (IDR) (f) = e/a ……
Surplus consumer/individual/visit (IDR) (g) = f/b ……
Tourism Economic Value (IDR) (h) = g x c …….

According Raphael and Molina (2007); Hakim (2011) describes total economic value (TEV) as a method of incorporating direct use and passive use of the environment into the overall economic framework. The main purpose of the Travel Cost Method is to provide an estimate for measuring the value of recreational areas using a demand curve approach based on the maximum use of consumers (Bedate *et al*., 2004; Godari & Ghiyasi, 2014).

RESULT AND DISCUSSION

Batukaras Beach is located in Batu Karas Village, Cijulang Sub District, Pangandaran District, West Java Province. Batu Karas means hard rock, the name was chosen because the stones left on this beach are the remains of a large rock eroded by waves and stones that are still remaining today. The condition of the bio-ecoregion of Batukaras beach is a combination of natural nuances between the marine tourism objects of Pangandaran Beach and Batu Hiu beach with a calm natural atmosphere, gentle sea waves make visitors feel comfortable enjoying the natural atmosphere on Batukaras Beach. Most marine tourism takes place along the shore and in the water immediately adjacent to the shoreline.

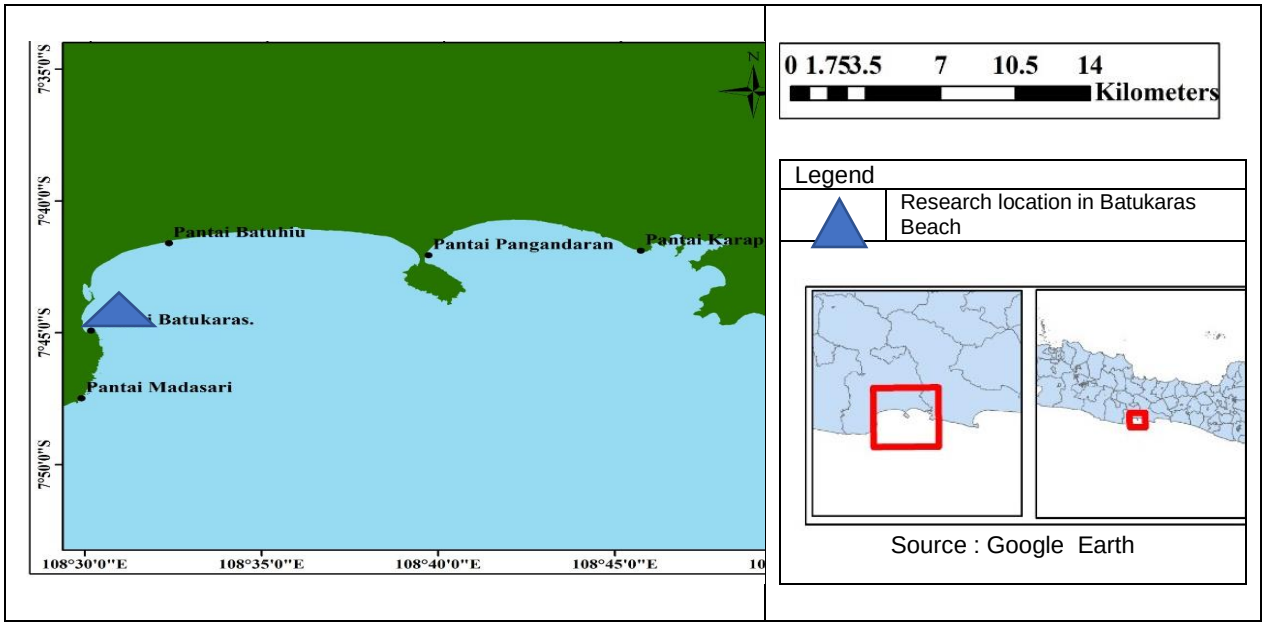

Figure 1. Research Location

Batukaras Beach has the following characteristics: (1) a beach that is classified as sloping and not muddy, so that it makes tourists feel safe and comfortable, (2) has a tidal bio-ecoregion condition that is long enough so that it can be used for beach tourism attractions, (3) the waves are not too big, because they are blocked by the bay, (4) Batukaras Beach is far from the mouth of the river so that the water is clean, (5) Batukaras Beach is not rocky which is dangerous, (6) The sloping beach structure attracts fish -Wild fish can't get close to the shore. Tourist attractions on Batukaras beach include surfing, swimming, mangrove forests, floating restaurants, cafes, fishing, hotels, villas, homestays, and various other tourist facilities. The number of domestic and international tourists visit Batukaras Beach in 2016 – 2020 can be seen in Figure 2.



Figure 2. The Number of Domestic and International Tourists Visit Batukaras Beach in 2016 - 2020

The number of domestic and international tourist visits has decreased during the COVID-19 pandemic. The strategy carried out in the development of marine tourism during the COVID-19 pandemic was to implement health protocols and limit the number of visitors. Batukaras Beach has different bio-ecoregion conditions from other beaches in the marine tourism area of Pangandaran Regency, West Java Province. The condition of the marine tourism bio-ecoregion basically provides a dynamic nature of natural resources due to the state of the ocean waves that are always moving.

Characteristics of Respondents

The characteristics of tourists in this study were obtained from interviews with tourists who came to the Batukaras Beach location. The number of tourists who became respondents in this study were 106 respondents of domestic tourists. Socio-economic factors of tourists consisted of gender, age, education level, occupation, income level, and area of origin. Characteristics of respondents based on socio-economic factors of tourists can be seen in Figures 3 and 4.

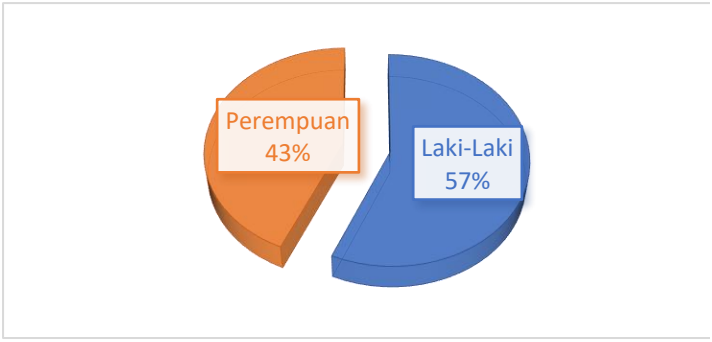

Figure 3. Characteristics of Respondents Based on Gender

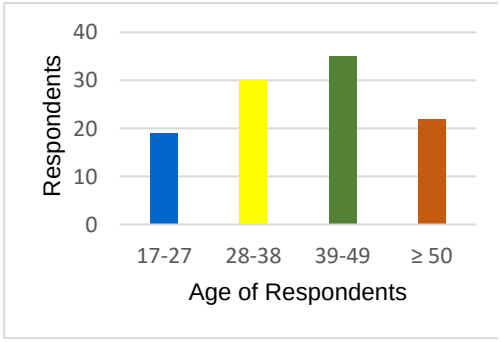

Figure 4. Characteristics of Respondents Based on Age

Based on this research in the field as many as 57% of visitors are dominated by men and the other 43% by women. The high percentage of respondents from men is due to interest in tourism with higher physical activity than women. Based on the results of the research, 33% were dominated by the age group of 28 - 38 years. The characteristics of the age of visitors have a relationship with the selection of tourist attractions based on the physical abilities of the respondents.

Based on this research in the field, the characteristics of respondents based on education level are dominated by undergraduate graduates by 32%. The zone travel cost method is based on the characteristics of the respondents based on the area of origin of domestic tourists, dominated by the Bandung area. The zonal travel cost method is a method that is used based on the number of visitors from various locations with different distances. Characteristics of respondents based on education level and origin can be seen in the Figures 5 and 6.

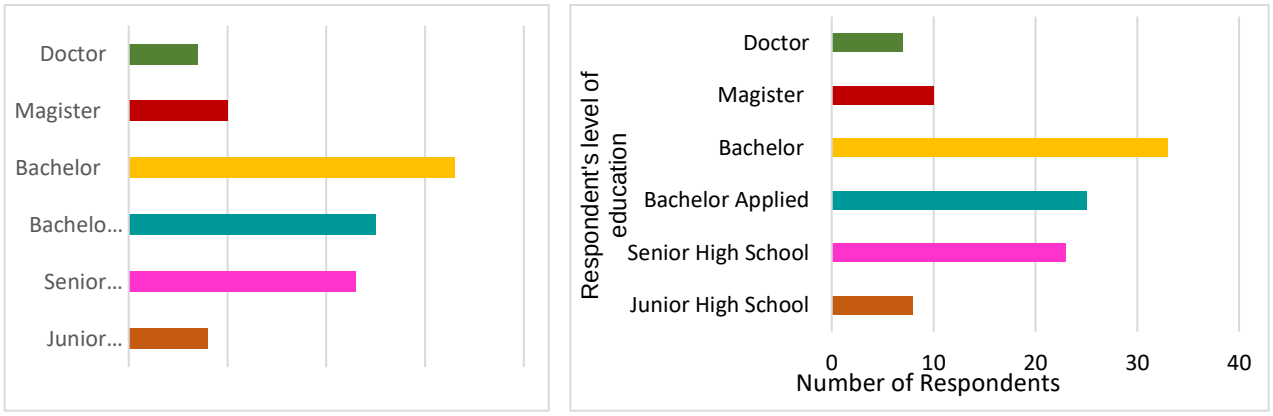

Figure 5. Characteristics of Respondents Based on Education Level

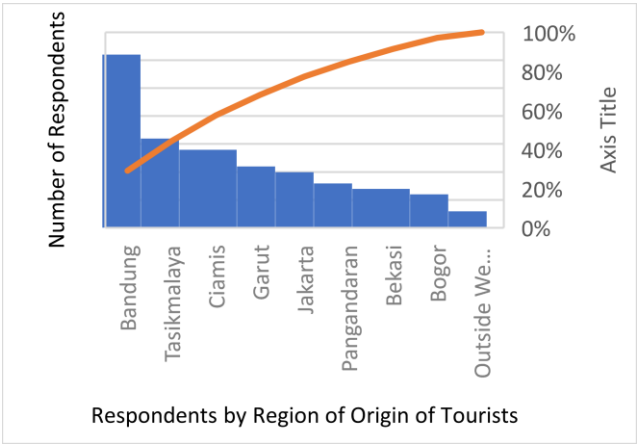

Figure 6. Characteristics of Respondents by Region of Origin of Tourists

Length of visit is defined as the time spent by tourists when traveling on Batu Karas beach, Pangandaran District can be seen in Table 2. Such tourists take their time from the morning to do activities to enjoy beach views, see the sunrise and do water sports such as swimming, banana boating, snorkeling, and others. These tourists also stay at hotels or villas available around tourist sites. Such tourists take their time from the morning to do activities to enjoy beach views, see the

sunrise and do water sports such as swimming, banana boating, snorkeling, and others. These tourists also stay at hotels or villas available around tourist sites.

Table 2. Characteristics of Respondents Based on Visit Length to the Marine Tourism

Characteristics	Category	Number of respondents	Percentage (%)
Visit Length	1 – 2 hours	17	16
	3 – 4 hours	16	15
	5 – 6 hours	6	6
	> 6 hours	67	63
Total		106	100
Time of Visit	Weekdays	20	19
	Holidays	57	54
	Weekend	29	27
Total		106	100
Transportation Facilities	Private car	55	52
	Tourist Bus	22	21
	Public transportation	6	6
	Motorcycle	17	16
	Travel	6	6
Total		106	100
Arrival partners	Family	60	57
	Friend	16	15
	Office colleagues	28	26
	Alone	2	2
Total		106	100

Source: Primary Data Processed (2021)

Tourists who visit the Batukaras Beach location mostly come during holidays as much as 54%. Based on the means of transportation used by tourists to the Batukaras Beach tourist location, most of the tourists come by private car, which is as much as 52%, cars and buses are used by tourists who bring family groups or those who come with friends. As many as 16% use a motorcycle. Respondents who use motorbikes, because they are more efficient in transportation costs and are more attractive when traveling. The rest decided to visit tourist sites by using a tourist bus, which was as much as 21%. Buses are usually used by groups of company or agency employees who will carry out activities such as gatherings. In addition to private cars, motorbikes, and tourism buses, there are 6% of respondents who come using public buses.

Test the Validity and Reliability of the Data

The validity test is useful to find out whether there are questions on the questionnaire that must be removed or replaced because they are considered irrelevant. The validity test was carried out on the questions in each variable. This research consists of eight variables, namely X_1 number of tourists, X_2 types of water tourism attractions, X_3 distance traveled by tourists, X_4 length of time for tourism activities, X_5 education level, X_6 income level, X_7 age, X_8 travel cost. Based on the reliability test obtained a value of 0.907 which means the data is reliable. While, the result of validity test shown in the Table 3.

Table 3. Validity Test Correlation Coefficient on Variable

No	Variabel	r	Category
1.	X_1 number of tourists	0.722	Valid
2.	X_2 types of water tourism attractions	0.376	Valid
3.	X_3 distance traveled by tourists	0.959	Valid
4.	X_4 length of time for tourism activities	0.737	Valid
5.	X_5 education level	0.845	Valid
6.	X_6 income level	0.425	Valid
7.	X_7 age	0.513	Valid
8	X_8 travel cost	0.399	Valid

Source: Primary Data Processed (2021)

The test criteria if the correlation between items with a total score of more than 0.35 then the instrument is declared valid, variables X_1 to X_8 are greater than 0.35 so that the data has high validity.

The factors that influence the development of marine tourism areas in the midst of the COVID-19 pandemic

During the new normal, several sectors began to be opened or reactivated by observing health protocols. One of them is marine tourism. A number of estimates of the model for developing marine tourism on the Batukaras Beach of Pangandaran Regency were obtained from interviews with 106 tourist respondents. The data that has been collected in this research was estimated using SPSS, which was then used to form a multiple linear regression model as follows:

$$Y=0.966-0.020X_1+0.010X_2+0.014\ X_3-0.033X_4+0.090X_5+4.96E\text{-}8+0.000X_6+\ 0.002\ X_7+0.61\ E\text{-}7\ X_8$$

Table 4. The Results of Multiple Linear Regression Analysis of the Factors that Influence the Development of Marine Tourism on the Batukaras Beach, Pangandaran Regency, West Java Province

Variable	Coefficient	*t test*	*Sig*	VIF
Constants	0.966	2.534	*0.013*	0.000
X_1 number of tourists	-0.020	-0.448	*0.655*	-0.012
X_2 types of water tourism attractions	0.010	-0.010	*0.922*	0.000
X_3 distance traveled by tourists	0.014	1.688	*0.000*	0.344
X_4 length of time for tourism activities	0.033	-0.533	*0.596*	-0.014
X_5 education level	0.090	1.189	*0,237*	0.032
X_6 income level	4.96E-8	1.916	*0.058*	0.052
X_7 age	0.002	-0.062	*0.951*	-0.002
X_8 travel cost	0.61 E-7	2.167	*0.033*	0.059
Uji F				157.459
R Square				0.964
Adjusted R Square				0.923

- Significant =0.05
- Source: Result of primary data analysis, 2022

From the results of the regression analysis, in the Table 4 can be seen Adjusted R-square value of 96.4% was obtained. Adjusted R-square value is a value that does not depend on the number of independent variables in the model. This means that the factors influencing the development of marine tourism on the Batukaras coast can be explained by the independent variables in the model by 96.4% and the remaining 3.6% being explained by variables not included in the model. The value of the variable coefficient determines the trend in the marine tourism development strategy. In multiple linear regression, the positive value of the coefficient of a variable

indicates that the higher the value of the variable, the more likely it is to increase the development of marine tourism at the Batukaras Beach.

Based on the t test which can be seen from the value of Sig. in Table 4, there are four variables that have a significant effect on the model, that is X_3 distance traveled by tourists, X_5 education level, X_6 income level, X_8 travel cost. The results of the F $_{test}$ at the 90 percent confidence level indicate that the resulting F_{count} value is 157.459 and the F_{table} value is 2.35, meaning that the F_{count} value is greater than the F_{table} value. This shows that together these factors have a significant influence on the development of marine tourism on the Batukaras Beach.

Marine tourism demand model obtained through regression analysis can be used to create a visitor demand curve through the inversion process of the degree equation visits to travel costs, namely: $Y = 0.966 + 0.00000061\ X_8$ (Figure 7).

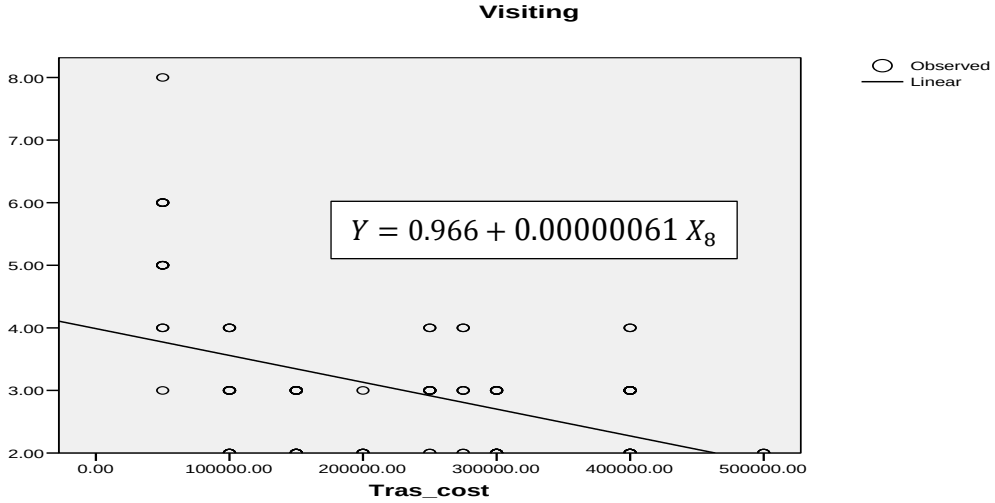

Figure 7. Marine Tourism Demand Curve to Batukaras Beach

Based on the results of the research through the demand curve approach, that the number of visits will increase, if the transportation costs of visits are getting cheaper, on the contrary the number of tourists will decrease if the transportation costs are getting more expensive. Batukaras Beach tourist attraction, to be able to develop transportation facilities that are easy to access with affordable, safe and comfortable transportation costs.

The economic value of tourism activities in Batukaras Beach, Pangandaran District, West Java Province

The economic value of marine tourism can be estimated using a travel cost approach by obtaining the amount of travel costs incurred by each tourist to enjoy marine tourism services at a particular tourist spot. The travel cost approach can estimate consumer surplus which is a proxy for the value of willingness to pay for the tourist sites visited.

After getting the consumer surplus value, the economic value of marine tourism on the Batukaras Beach of Pangandaran Regency can then be calculated. The calculation of the estimated economic value of tourism can be seen in Table 5.

$$TCM = TrC + CoC + AcC + Ef$$

$$IDR\ 79{,}795{,}000 = IDR\ 24{,}425{,}000 + IDR\ 22{,}680{,}000 + IDR\ 30{,}550{,}000 + IDR\ 2{,}140{,}000$$

$$ATC = \frac{\sum TTC}{V}$$

$$IDR\ 752{,}783 = \frac{IDR\ 79{,}795{,}000}{106}$$

Economic value of the marine tourism environment based on travel expenses, in Batukaras Beach, Pangandaran District.

$$EVMT = ATC\ X\ V$$

$$IDR\ 79{,}795{,}000 = IDR\ 752{,}783\ X\ 106$$

Table 5. Estimating the Economic Value in Marine Tourism Based on Willingness to Pay in Batukaras Beach, Pangandaran District, West Java Province

Variabel	Value
Number of respondents (people) (a)	106
Number of respondent visits (times/year) (b)	318
Number of tourist visits in 2020 (times) (c)	349,278
Travel cost coefficient (d)	0.00000061
Total consumer surplus (IDR) (e)	33,428,000.00
Surplus Consumer/individual (IDR) (f) = e/a	315,358.49
Surplus Consumer/individual/visit (IDR) (g) = f/b	2,975.08
Tourism Economic Value (IDR) (h) = g x c	1,039,130,027

Source: Primary Data Processed (2021)

Based on the calculations that have been made, the consumer surplus per individual per visit is IDR 2,975.08. The economic value of tourism is obtained from the multiplication of the consumer surplus with the number of tourist visits in the 2020 period, which is 349,278 so that the economic value of tourism in marine tourism on the Batukaras beach, Pangandaran Districts IDR 1,039,130,027.

The pattern of visits by domestic tourists in general makes mass tourism trips on weekends and national holidays, especially during religious holidays. The economic value of this tourism shows that marine tourism in Batukaras Beach Pangandaran District a tourist place that utilizes natural resources and the environment as well as natural resources as the main attraction has enormous economic value. The condition of the marine tourism bio-ecoregion has (1) a special attraction that differs on the characteristics of the coast from one area to another; (2) a beach tourism attraction that can be used and enjoyed by tourists safely and comfortably; (3) a unique characteristic in the aspect of shopping tourism which has become an icon of marine tourism.

CONCLUSION AND SUGGESTION

Conclusion

The development of marine tourism in the pre and post-COVID-19 pandemic requires coordination between stakeholders, namely the government and marine tourism business actors. Based on the results of the research, it can be concluded: (1) The factors that influence the development of marine tourism areas in the midst of the COVID-19 pandemic is four variables that have a significant effect on the model, that is distance traveled by tourists, education level, income

level, travel cost; (2) The economic value of tourism activities in Batukaras Beach, Pangandaran District, West Java Province, using willingness to pay that is cconsumer surplus with the number of tourist visits in the 2020 period, which is IDR 349,278 so that the economic value of tourism in marine tourism on the Batukaras Beach, Pangandaran Regency is IDR 1,039,130.

Suggestion

The development of marine tourism areas on the Batukaras coast should be equipped with management plans based on bio-ecoregional conditions and improvement of marine tourism facilities and infrastructure, so that tourists will feel safe and comfortable in carrying out marine tourism activities.

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