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# The travel cost approach for the demand natural tourism object of Cipendok Waterfall

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**Abstract.** The purpose study was to measure the economic value obtained from visitors of Cipendok waterfall natural tourism using the individual travel cost method. Multiple linear regression as the analytical tool used with the number of personal visits as the dependent variable and four variables as independent variables namely travel cost variable to Cipendok waterfall (including round-trip transportation costs, consumption costs, entrance ticket costs, parking fees, documentation fees, and fees others) (Rp), age variable (years), income variable (Rp) and distance variable (km). Based on this research, the economic value of Cipendok waterfall is obtained. The value of consumer surplus obtained is Rp. 448,367.5 per individual per year or Rp.112,099.4 per individual per one visit, so that the total economic value of Cipendok waterfall natural tourism is calculated at Rp. 6,188,512,875.00. From the significance test results obtained that only two variables were statistically significant, namely the travel cost variable to Cipendok waterfall and the average income variable, while the other independent variables did not significantly influence the number of Cipendok waterfall natural attractions.

## 1. Introduction

The southern part of Central Java has promising natural resource and tourism potential [1-5]. Natural attractions Cipendok Banyumas has excellent potential to be developed [6]. The great potential of Cipendok attractions can be seen as the beauty and resource of natural scenery, exotic nature waterfall, tourism, and charms of culture.

Tourism demand will be influenced by the state of the tourists and the state of the attraction. Traveler circumstances include income, age, distance to attractions, and other things. Then the state of the attractions consists of the price of the tourist attractions and other tourist attractions as a comparison, facilities, and other infrastructure that support increased tourism demand, cleanliness, and other things [7-9].

Formulation issues such as: how can the influence of the cost of trips to attractions Cipendok to the number of tourist visits Cipendok? How the effect of age on the number of tourist visits Cipendok? How to influence the level of income per month to the number of tourist visits Cipendok? How the effect of distance on the number of tourist visits Cipendok?

Objective among others; to analyze the effect of transportation cost to the attractions Cipendok to the number of tourist visits Cipendok, to explain the effect of age on the number of tourist visits Cipendok, to analyze the impact of the level of income per month to the number of tourist visits Cipendok.



## 2. Methods

This study begins with a survey. The area under study is Banyumas, the attraction Cipendok. Source Data obtained from various sources that the BPS, Department of Culture and Tourism Banyumas, and other relevant agencies. Types of data collection consisted of primary and secondary data. Primary data are taken randomly sourced from respondents include: the cost of travel, age, level of income per month, and distance. Primary data were collected with a structured interview using a questionnaire is supported by direct observation of tourist activities. Collection of secondary data obtained from the management Cipendok, BPS, Department of Culture and Tourism. Data collected include geographic conditions and administration of the territory, the state population, state facilities, and infrastructure.

The technique of collecting data from secondary data analysis, and interviews. Mechanical interviews were conducted with respondents using a questionnaire which, among other media. Documentation method is also used to facilitate the execution means if no mistake in recording the data source remains or unchanged. This method is also used to document the state of the research location, description of the profile and background of the study.

The population in this study are the tourists visiting attractions in Cipendok. The sampling technique used is Accidental Sampling (intended for anyone who visits the location), but the number is limited. With this technique, not all of the elements or members of the population are given the same opportunities to be selected into the sample (Non-Probability Sampling) [10]. In this study, the intent of whoever is Cipendok visitors who can and are willing to fill out a questionnaire. The samples studied were 100 respondents.

Regression analysis is a method used to analyze the relationship between variables. The connection can be expressed in the form of equations that connect the dependent variable Y with one or more independent variables X1, X2, ..., Xn. In regression analysis, the pattern of relationships between variables is expressed in a regression equation that is allegedly based on the sample data [11-13].

To analyze visits to Cipendok influenced by the cost of a trip to Cipendok, visitors aged, average earnings, and distance of visitor's residence, so formulated as follows:

$$\text{Ln } Y = b_0 + b_1 \text{Ln } X_1 + b_2 \text{Ln } X_2 + b_3 \text{Ln } X_3 + b_4 \text{Ln } X_4 + e$$

Ln Y = Number of Attraction visitor Cipendok

Ln X1 = The cost of traveling as tourist attractions such as transportation costs, consumption costs, entrance fees, parking fees, and other costs

Ln X2 = Visitor age

Ln X3 = Average income - average per month visitor

Ln X4 = Distance of visitor's residence

e = error term

## 3. Results and discussion

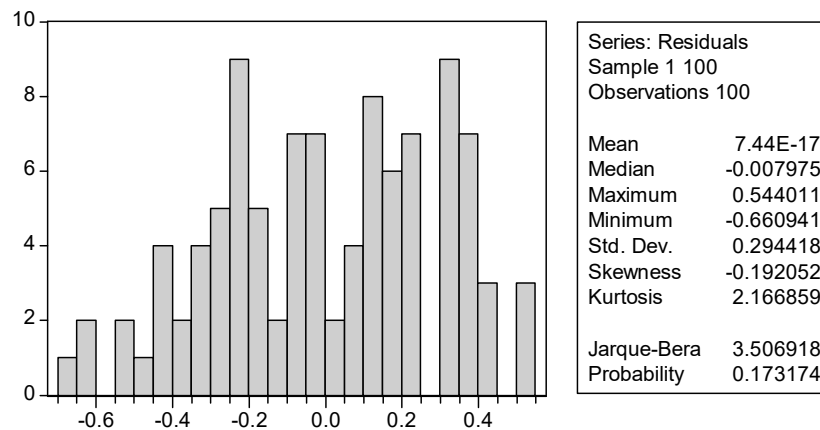
Regression analysis to look at the factors-factors related to the problem in question is the effect of travel costs, age, earning an average monthly visitor, and the distance to the number of visiting attractions in Cipendok, it is as a supporter of the quantitative analysis.

Regression analysis includes the presentation of the classic assumption test, and the results of the regression relationship between the independent variables and the dependent variable statistical analysis conducted step are covering the independent variables individually and simultaneously.

This test is intended to determine (detect) whether or not the normality of the data, heteroscedasticity and autocorrelation. Multicollinearity the regression results will be analyzed. Because in case of deviation from the classical assumption, and the F test carried out to be invalid and statistically conclusions obtained the results are not good.

### 3.1. Normality test

Normality test to determine the level of distribution of the data already normal or not. Based on Figure 1, shows that the probability value is higher than 0.05 and the value of Jarque Bera statistics are still very close to 1, so that concluded the data is normal.



**Figure 1.** Results of normality test

### 3.2. Multicollinearity test

For determining whether or not multicollinearity used Farrar and Glauber test (Table 1).

**Table 1.** Results of multicollinearity test

R <sup>2</sup>	Value
Main	0.77
X1	0.70
X2	0.07
X3	0.54
X4	0.35

From the test results, multicollinearity using comparative tests  $R^2$  major regression by comparison  $R^2$  each independent variable, the results as described above show that the results are the main  $R^2$  has the highest value of 0.77, which means that the number of visiting attractions Cipendok there are no Multicollinearity. From the analysis of  $R^2_1 = 0.70$  higher than  $R^2_2 = 0.07$ ,  $R^2_3 = 0.54$ , and  $R^2_4 = 0.35$  then there is no empirical models multicollinearity.

### 3.3. Autocorrelation test

To find out whether or not autocorrelation is used serial test LM Test Correlation using lag 1, the results can be seen in Table 2. From the autocorrelation test above with lag, one shows that the probability  $> 0.05$  which means there is no autocorrelation disease.

**Table 2.** Results of autocorrelation test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.657072	probability	0.075477
Obs * R-squared	5.405268	probability	0.067029

### 3.4. Heteroscedasticity test

To determine whether or not the test was used heteroscedasticity White Heteroscedasticity Test, results can be seen in Table 3. From the above analysis indicates that heteroscedasticity the probability

is  $> 0.05$ , which means that the number of visiting attractions in Cipendok there is no heteroscedasticity.

**Table 3.** Results of heteroscedasticity test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.117329	18.14002	-0.006468	0.9949
X1	0.745474	1.128399	0.660647	0.5104
X2	0.324630	1.724555	0.188240	0.8511
X3	-0.256621	0.336221	-0.763251	0.4472
X4	0.301055	0.376249	0.800149	0.4256
R-squared	0.018711	Mean dependent var		6.087617
Adjusted R-squared	-0.022606	SD dependent var		9.330005
SE of regression	9.434874	Akaike information criterion		7.375409
Sum squared resid	8456.601	Schwarz criterion		7.505668
Log-likelihood	-363.7705	F-statistic		0.452861
Durbin-Watson stat	1.459586	Prob (F-statistic)		0.770075

### 3.5. Interpretation of regression results

In table 4 adjusted R squared of 0.7739. This shows that with a rate of 77.39 percent of the value of the independent variable in the form of travel expenses, age, earning an average monthly visitor, and the distance can explain the dependent variable number of visiting attractions in Cipendok.

**Table 4.** Results of regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.098257	0.577858	12.28374	0.0000
LnX1	-0.359551	0.035946	-10.00263	0.0000
LnX2	-0.071836	0.054936	-1.307628	0.1942
LnX3	0.047398	0.010710	4.425398	0.0000
LnX4	0.021202	0.011986	1.768919	0.0801
R-squared	0.783109	Mean dependent var		3.266640
Adjusted R-squared	0.773976	SD dependent var		0.632183
SE of regression	0.300552	Akaike information criterion		0.482314
Sum squared resid	8.581488	Schwarz criterion		0.612573
Log-likelihood	-19.11571	F-statistic		85.75188
Durbin-Watson stat	1.559565	Prob (F-statistic)		0.000000

Information:

Ln Y = Number of attraction visitor Cipendok

Ln X1 = The cost of traveling as tourist attractions such as transportation costs, costs consumption, entrance fees, parking fees, and other costs

Ln X2 = Visitor age

Ln X3 = Average income - average per month visitor

Ln X4 = Distance of visitor's residence

The regression results are presented in Table 4 show that the results of multiple regression analysis to Total visited attractions Cipendok in Banyumas is:

$R^2 = 0.783$

Adjusted R-Squared = 0.773

Durbin-Watson Statistics = 1.55

F-statistics = 85.75

The regression results above show that the probability of the travel costs, and the average income per month visitor statistically significant effect on the amount and visited attractions in Cipendok at an

alpha level of 5% ( $< 0.05$ ). The independent variable travel costs have a negative correlation to the number of visiting attractions in Cipendok, while the independent variable income per month on average visitors have a positive relationship to the number of visiting attractions in Cipendok as seen in the results of the regression coefficients. A probability value variable distances aged visitors and visitors with Cipendok residence were not statistically significant at the alpha level of 5% ( $< 0.05$ ).

F-statistic describes the results of the regression analysis of independent variables together on the dependent variable. The study showed that the F-statistic of 85.75 and with Probability 0.0000 with alpha 5% (0.05), looks probability is smaller than the alpha namely  $0.00000 < 0.05$ , thus with the same independent variables have a significant effect on the dependent variable or the number of visiting attractions in Cipendok.

The results of the regression equation:

$$\text{Ln } Y = 7.099 - 0.360 \text{ Ln } X_1 - 0.072 \text{ Ln } X_2 + 0.047 \text{ Ln } X_3 + 0.021 \text{ Ln } X_4.$$

Information:

Ln Y = the number of visiting attractions in Cipendok

Ln X1 = travel expenses.

Ln X2 = age

Ln X3 = the average income per month visitor

Ln X4 = distance

From the equation above regression results indicate that the value of Y (the number of visiting attractions in Cipendok) if it is not influenced by the cost of travel, age, earning an average monthly visitors, and the distance or it could also be said fourth value independent variable (affecting) is 0, so the value of the number of visiting attractions in Cipendok amounted to 7.099 percent.

1. Ln travel expenses = -0.360

From the results of the multiple regression above, the variable sign for Ln travel costs are negative, namely -0.360 which indicates that if Ln travel costs go up or increase by 1 percent, it will cause a decrease in the number of visits to Cipendok tourism objects by 36.00 percent, regression results assuming other variables remain (*Ceteris Paribus*).

2. Ln average income per month visitor = 0.047

The variable sign for the average monthly income of visitors is positive, which is 0.047, shows that if the average monthly income per visitor rises or increases by 1 percent, the number of visitors to Cipendok increase by 4.70 percent, the results regression assuming other variables remain (*Ceteris Paribus*).

The findings of the regression analysis show that travel costs have a significant effect on the number of visits to Cipendok tourism objects. The total cost of travel to Cipendok tourist attractions that must be borne by visitors which includes transportation costs, consumption costs, entry tickets, parking fees, and other costs indeed have a tendency to increase from year to year because it follows the increase in inflation. For this reason, the increase in travel costs borne by visitors must be balanced with satisfying service from the management of Cipendok tourism objects which in this case can be obtained in the form of comfort for visitors during a tour in Cipendok [14-16].

The average income per month of visitors who have a significant influence on the number of visits to Cipendok tourism objects needs to be addressed with an increase in the level of tourism promotion that must be continuously carried out through national, international, television media and internet print media [14,15]. The value of consumer surplus obtained is Rp. 448,367.5 per individual per year or Rp.112,099.4 per individual per one visit, so that the total economic value of Cipendok waterfall natural tourism is calculated at Rp. 6,188,512,875.00.

#### 4. Conclusion

Findings of the things that affect the state of the number of visiting attractions Cipendok noteworthy. The cost of travel and the average income per month visitor becomes essential things to increase the

volume of Attraction visit Cipendok. Another issue that is reflected in them of supporting infrastructure conditions should continue to be considered, state of facilities and infrastructure in attractions that need to be added, the level of tourism promotion should be further increased, and increasing the involvement of local communities to participate in tourism development efforts.

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