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Economic valuation of Bhumi Merapi Agrotourism in Sleman Regency

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Abstract. Agrotourism is the development of tourism that utilizes the natural environment and agricultural activities. This research aims to identify the characteristics of visitors, to identify the factors that influence the number of visits, and to estimate the economic value of Bhumi Merapi agrotourism. This research was conducted with questionnaires survey to 75 visitors through accidental sampling method. The descriptive-analytical method was used to know the characteristics of visitors, multiple linear regression analysis was used to identify the factors that influence the number of visits, and the economic value was measured using zonal travel cost method. The results indicated that the characteristics of visitors to the Bumi Merapi agrotourism are most visitors aim for recreation in groups of less than or equal to 10 people, come from the Sleman district and plan to return visit. Income and visit experience had a positive influence; meanwhile, travel cost, distance, and the number of the family had a negative impact on the number of Bhumi Merapi visitors. The economic value of Bhumi Merapi agrotourism consists of total willingness to pay and the total value paid, respectively Rp. 61,022,254,800.00 / year and Rp. Rp12,164,238,100.00 / year.

1. Introduction
Natural resources and the environment are Indonesia’s assets that contribute to regional income and affect the welfare of the community. Natural resources and the environment provide various services as a support system for people's lives [1]. The source of oxygen for breathing, food, the beauty of the scenery, the coolness of nature, and the sheltering shade are part of the environmental benefits both directly and indirectly. The environment as an asset is expected to continue to provide aesthetics and maintain life [2].

The agricultural sector in the narrow and broad sense is determined by the utilization of the potential of natural resources and the environment with various input and output factors and management. At present, the development of the agricultural sector as a tourist attraction is increasingly being looked at as an effort to exploit the potential of...
existing natural resources. One of the developments of the agricultural sector into a tourist attraction is called agrotourism, which is a combination of the agricultural and service sectors [3].

Bhumi Merapi agrotourism is a tourist attraction in Sleman Regency, Yogyakarta. This agrotourism is increasingly being looked at as a tourism choice because it has a strategic location to enjoy the beauty and coolness of nature around Mount Merapi and the interesting concept of interaction with flora and fauna. Bhumi Merapi agrotourism is designed as an educational tourism destination with various zones such as the rabbit park, goat park, reptile park, poultry garden, flower garden, hydroponic plants, riding rides, biogas and hydram (hydraulic ram pump). Bhumi Merapi agrotourism is still being developed so that it can reach a wider range of tourists with a variety of potentials that can contribute to regional income and support the economy of the surrounding community.

The development of Bhumi Merapi agrotourism lies in the utilization of natural resources in it. Natural resources are natural resources that will continue to decrease if not maintained and preserved. Appropriate policies in management can support the sustainability of natural resources and the agrotourism environment that provides both short-term and long-term benefits. Information limitations in the quantity and quality of the agrotourism environment affect the decision making on the management and control of natural resources. Thus, knowledge of the value of the agrotourism environment is needed as a consideration of inappropriate development policies.

In general, the value of the economic benefits of natural resources and the environment of an agrotourism is intangible or cannot be measured at market prices, so an approach is needed. The value of economic benefits can be calculated by estimating the consumer surplus. Consumer surpluses provide a picture of the benefits obtained because consumers can buy units of goods or enjoy services at lower price levels [4]. An activity representing the value of benefits of a natural resource and the environment with a particular approach for the purpose of maintaining the value of natural resources is called environmental, economic valuation [5]. The most commonly used approaches to valuing public goods are contingency methods, travel costs, hedonic prices, and preferred models. These approaches have different conceptual bases so that the choice of methods is adjusted to the location, type of data, and objectives to be achieved [6].

The travel cost method (travel cost method / TCM) is the economic valuation method most commonly used in a tourist attraction where visitors have to sacrifice something of economic value to be able to enjoy the beauty and facilities in it. Measurement of the number of costs that must be incurred to be able to reach tourist attractions (tickets, transportation, consumption, and other costs) becomes basic information in TCM [7]. TCM divides costs into two main components, namely direct costs, and time costs. Direct costs for example in the form of fuel and accommodation, while the cost of time is the length of time a person takes to reach a tourist attraction is calculated from the place of origin [8]. TCM can be used as a material consideration in the elimination of existing recreation sites, maintaining and developing recreational sites, as well as estimating changes in environmental quality in recreational areas [9]. This method is not controversial because it is modeled on standard economic techniques to measure value using information about actual behavior rather than verbal responses to hypothetical scenarios. In addition, the method of travel costs is easier in interpreting the results [10].

Economic valuations with TCM are limited to measurements based on direct use-value, which is the value obtained when someone takes an intentional action to enjoy specific natural resources both from the financial benefits obtained by harvesting natural resources or the welfare obtained when interacting with the environment, such as fishing or enjoying the scenery. Value without use consisting of choice value, inheritance value,
and existence value can be measured by contingency method. Travel cost method and contingent valuation method in the economic valuation of tourism forests in Alpine Valley, Italy [11]. The hypothetical scenario must be detailed and comprehensive to get an effective CVM assessment.

Based on the description that has been submitted, it is important to have research on the economic valuation of Bhumi Merapi agrotourism to analyze the factors that influence visits and determine the economic value of agrotourism as a consideration in development policies in order to obtain high corporate profits while continuing to prioritize consumer satisfaction and improve the quality of the agrotourism environment.

2. Materials and Methods

2.1. Basic Method
The basic method used was a descriptive analysis which is a method for examining the status of human groups, objects, conditions, a system of thought, or a class of events in the present. This method aims to describe an event in a systematic, factual, and accurate manner facts, properties, and relationships between the phenomena studied [12].

2.2. Location and Sampling
The research location was determined by purposive sampling, with the consideration that the Bhumi Merapi agrotourism is a prospective natural tourism object for economic growth, has easy accessibility, and is in great demand by many visitors. The data were primary and secondary data. Primary data was obtained through interviews with 75 visitors representing the peak season and low season. The interviews were done by incidental sampling. Incidental sampling is a sampling technique based on anyone who incidentally meets with researchers can be used as a sample, provided that the person is in accordance with the criteria [13]. Secondary data were obtained from the managers of Bhumi Merapi and the Central Statistics Agency. Secondary data were included the profile of Bhumi Merapi, facilities, number of visitors in the past one year, data on the number of inhabitants in each zone or district.

2.3. Data Analysis Method

2.3.1. Visitor Characteristics
The characteristics of visitors to the Bhumi Merapi agrotourism were classified into certain categories which include: the purpose of the visit, the number of groups, the place of origin (regency or city) and the desire to return.

2.3.2. Factors That Influence the Level of Visits at Bhumi Merapi Agrotourism
This study examined eight independent variables that are thought to have an influence on the dependent variable. The independent variables tested were travel expenses (X1), average monthly income (X2), distance (X3), level of education (X4), age (X5), number of dependents (X6), visiting experience (D1) and status marriage (D2). The dependent variable (Y) was the level of visits to the Bhumi Merapi agrotourism. Determination of the level of visits per 1,000 inhabitants was calculated by the formula:

\[
TK = \left( \frac{\sum Vi}{n} \right) \times N \times 1000
\]

Where:

- TK : visit rate (person)
- Vi : number of samples from zone i (person)
- n : total number of samples (person)
- N : total number of visits in 1 year (April 2017-March 2018)
Pi : inhabitants of zone-i (person)

This study used a logarithmic regression model because the ordinary model had heteroscedasticity problems. These problems cause the results of the t-test and F test were invalid. Heteroscedasticity problems often occur in cross-section data [14]. With the transformation of data into the logarithmic form, the error will be smaller so that heteroscedasticity in the regression model can be overcome. The following regression models are used:

$$\ln Y = \beta_0 + \ln \beta_1 X_1 + \ln \beta_2 X_2 + \ln \beta_3 X_3 + \ln \beta_4 X_4 + \ln \beta_5 X_5 + \ln \beta_6 X_6 + D_1 + D_2$$

Where:
- Y : visit rate per 1000 inhabitants per year (person)
- X_1 : travel costs (Rp)
- X_2 : income (Rp)
- X_3 : distance (km)
- X_4 : age (years)
- X_5 : education (years)
- X_6 : family member (person)
- D_1 : traveling experience
  - 1 : ever visited
  - 0 : never visited
- D_2 : dummy marital status
  - 1 : already married
  - 0 : single
- $\beta_n$ : regression coefficient
- $\beta_0$ : intercept

2.3.3. The Economic Value of Bhumi Merapi Agrotourism

The economic value of agrotourism can be determined by the travel cost method. The economic value of Bhumi Merapi agrotourism included willingness to pay, the value paid, and consumer surplus. Determination of the economic value using the Marshall demand curve. A demand model was made, which is the relationship between the number of visits per 1,000 inhabitants and the cost of the trip to find this curve. Following were the steps for the analysis [15]:

a. Regressing visit level (Y) with the factors that influence it (X). The regression model used a normal model without using dummy variables. The logarithmic model in the previous stage is only used to interpret the factors that affect the level of visits. The regression model used:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Where:
- Y : visit rate per 1000 inhabitants per year (person)
- X_1 : travel costs (Rp)
- X_2 : income (Rp)
- X_3 : distance (km)
\( X_4 \): age (years)
\( X_5 \): education (years)
\( X_6 \): family member (person)
\( \beta_n \): regression coefficient
\( \beta_0 \): intercept

b. Determine the new intercept \( \beta_0 \) 'which is a demand function with the independent variable \( X_1 \) where other factors are fixed, so that:

\[
Y = \beta_0 + \beta_1 X_1
\]

Converts an original function equation to:

\[
X_1 = \frac{Y - \beta_0}{\beta_1}
\]

c. Estimating the average willingness to pay with the formula:

\[
U = \int_a^b f(Y) \, dY
\]

Where:
\( U \): average willingness to pay visitors
\( f(Y) \): demand function
\( a \): average visit rate \( (\bar{y}) \)

d. Determine the average price \( (X_1) \) at \( (y) \) by substituting to form an equation:

\[
\bar{X}_1 = \frac{\bar{y} - \beta_0}{\beta_1}
\]
e. Determine the average value paid by consumers through multiplying the value of \( X_1 \) (the results of the previous step) with the value of \( y \).

f. Determine the consumer surplus, which is the difference between the willingness to pay and the value paid.

2.3.4. Calculates the total value of consumer surplus, willingness to pay, and the value paid by inhabitants’ multiplication.

The economic value per 1000 inhabitants was used as the basis for determining the total value, which includes willingness to pay, the value paid, and the value of consumer surplus. Calculation of the total value of Bhumi Merapi agrotourism was to multiply the average economic value per 1000 inhabitants by the total inhabitants of all zones as the following formula.

\[
TEV = \frac{\text{average value} \times \text{total population}}{1000}
\]

3. Results and Discussion

3.1. Visitor Characteristic

The characteristics of visitors can describe the state of consumers in the Bhumi Merapi agrotourism. This description can explain the potential target market for Bhumi Merapi agrotourism. In addition, visitor characteristic data can also be used as a reference in the preparation of marketing strategies, development, as well as the preservation of the
Bhumi Merapi agrotourism in order to have a higher environmental value in the future. The following are description of the characteristics of visitors in the study:

3.2. Visitor Characteristics by Type and Purpose of Visit

Knowledge of the purpose of the visit was important as a material consideration in providing facilities and facilities to meet the desires of visitors. Based on research, most of visitors visit the Bhumi Merapi agrotourism with the aim to travel, which is divided into 73.33% was the main visit, while 2.67% was a stopover tourist visit. Visitors of Bhumi Merapi agrotourism with the aim of visiting to learn nature (field trip) was 12% with the main visit category of 10.67% and stopover visits of 1.33%. 1.33% of visitors were the main visit in the context of camping with the school group. Agrotourism visitors with the aim of meeting work agencies had the same percentage with visitors who aim to research (4%) as presented in Table 1.

Most of visitors choose Bhumi Merapi agrotourism as the main destination for recreation. The purpose of the visit in the form of recreation and natural learning (field trip) had quite a lot compared to other visit destinations. This is in line with the vision of Bhumi Merapi agrotourism as an integrated Integrated Farming-based agrotourism. The diverse purpose of the visit illustrates that the Bhumi Merapi agrotourism provides a variety of facilities for visitors to carry out various interests both recreation, nature learning, research, camping, meetings, and outbound. This was done to expand the market share both among children, adolescents, and adults.

| The purpose of the visit | Type of visit | Total (person) | Percentage (%) |
|--------------------------|--------------|----------------|----------------|
| Recreation               | Main 73.33   | 55             | 76.00          |
| Fieldtrip                | Stop by 2.67 | 2              | 57             |
| Camping                  | Main 1.33    | 8              | 12.00          |
| Outbound                 | Stop by 2.67 | 2              | 9              |
| Meeting                  | Main 4.00    | 3              | 4.00           |
| Research                 | Stop by 4.00 | 3              | 4.00           |
| Total                    |              | 72             | 100.00         |

Source: Primary Data Analysis, 2018

3.3. Visitor Characteristics Based on the Number of Groups

The number of groups of visitors to the Bhumi Merapi agrotourism were varies. Tourists who come with friends and family tend to have a smaller number of groups than tourists who come with work or school groups. The basis for classifying the number of groups used in this study was the variation in the data on the number of members from each visitor. Based on Table 2., it is known that the majority of visitors come in groups less than equal to ten people, which was as much as 85.33%. The percentage of the group with a range of 31 to 50 people was 5.33% and 4%.

| Number of groups (person) | Total (person) | Percentage (%) |
|---------------------------|----------------|----------------|
| ≤ 10                      | 64             | 85.33          |
| 11 – 30                   | 1              | 1.33           |
| 31 – 50                   | 4              | 5.33           |
| 51 – 100                  | 3              | 4.00           |
3.4. **Visitor Characteristics Based on Place of Origin**

The area of origin was identical with the distance and travel time that must be taken for visitors to be able to reach the tourist attractions. In addition, the area of origin of visitors was a description of how extensive information about the existence and appeal of the Merapi Bhumi agrotourism visitors come from various regions. Based on data from 84% of the visitors surveyed, it was found that visitors came from 16% of the regencies spread across the provinces of DIY, Central Java, and East Java. If viewed from the average distance traveled, the farthest origin area was Mojokerto Regency while the nearest visitor's origin area was Sleman Regency. Most respondents came from Sleman Regency, which was 37.33%. That was because regions close to locations tend to be easier to get information transfers from promotions through pamphlets, banners, or individuals. Based on the distribution of the origin of respondents, it was known that the farther the distance from the location of origin to attractions, the number of respondents who visit tends to be less (Table 3).

**Table 3. Distribution of Bhumi Merapi Agrotourism visitors’ origin place in 2018**

| Place of Origin | Average distance (km) | Average cost (Rp) | Total (person) | Percentage (%) |
|-----------------|----------------------|------------------|----------------|----------------|
| Sleman          | 18.21                | 145.700          | 28             | 37.33          |
| Kota Yogyakarta | 25.00                | 224.400          | 9              | 12.00          |
| Klaten          | 38.33                | 241.600          | 3              | 4.00           |
| Bantul          | 38.50                | 203.000          | 11             | 14.67          |
| Magelang        | 43.33                | 253.300          | 3              | 4.00           |
| Gunungkidul     | 55.00                | 300.000          | 3              | 4.00           |
| Kulonprogo      | 57.00                | 238.000          | 5              | 6.67           |
| Boyolali        | 60.00                | 350.000          | 1              | 1.33           |
| Surakarta       | 71.67                | 358.300          | 3              | 4.00           |
| Purworejo       | 80.00                | 350.000          | 1              | 1.33           |
| Kota Semarang   | 120.00               | 716.600          | 3              | 4.00           |
| Semarang        | 125.00               | 387.500          | 2              | 2.67           |
| Magetan         | 140.00               | 325.000          | 1              | 1.33           |
| Mojokerto       | 280.00               | 625.000          | 1              | 1.33           |
| **Total**       | **75**               | **100,00**       |                |                |

Source: Primary Data Analysis, 2018

Based on Table 3, visitors from Sleman Regency issued the lowest average cost, which was Rp.145,700.00. The highest average cost incurred by visitors from the city of Semarang was Rp716,600.00. The high average cost was because there were visitors who spend the cost of staying around the Bhumi Merapi agrotourism in order to be able to do longer tourist activities. Visitors from Mojokerto incurred the second-highest average cost, amounting to Rp625,000.00, which included: transportation costs that were quite high with a distance of reaching 280 km, consumption costs, overnight fees, and shopping costs. The farther the distance from the origin of the object to the Bhumi Merapi agrotourism, the higher the costs incurred hence tourists' interest to visit tends to be lower.

3.5. **Characteristics of Visitors Based on Returning Wishes**
The concept promoted by Bhumi Merapi agrotourism was more valuable than the costs. It impacts 93.33% of visitors plan to make a return visit. In addition, the facilities and services obtained by visitors were felt by most visitors. Distribution of visitors to Bhumi Merapi based on desires can be seen in Table 4.

Table 4. Distribution of visitors based on the willingness to return at Bhumi Merapi Agrotourism

| The Willingness to return | Total (person) | Percentage (%) |
|---------------------------|----------------|----------------|
| Yes                       | 70             | 93.33          |
| No                        | 5              | 6.67           |
| Total                     | 75             | 100.00         |

Source: Primary Data Analysis, 2018

3.6. Factors That Influence the Level of Visits at Bhumi Merapi Agrotourism

The level of tourist at the Bhumi Merapi Agrotourism were influenced by various factors. This study examined whether the factors of travel costs, average income, distance, ages, education, number of family dependents, visiting experience, and marital status influence the level of visits to the Bhumi Merapi agrotourism. Before analyzing the visit factors, visitors are grouped by origin so that they were divided into zones or districts. The number of visitors in one year was obtained from secondary data of the management of Bhumi Merapi agrotourism. Data shows that the number of tourist visits in the past year (1 April 2017 - 30 March 2018) at Bhumi Merapi agrotourism was 56,035, which was calculated from the total sales of entrance tickets, rental places and group visits both field trip and outbound. This value was then used to calculate the level of visits per thousand residents with data on the number of residents of each zone based on the latest Central Statistics Agency data.

Ideally, the determination of zones in the Travel Cost Method was based on secondary data on the distribution of the places of origin of visitors to agrotourism. Agrotourism does not have complete and written data on the place of origin of visitors, so the area based on regencies or cities were used in this study.

Table 5 shows the calculation of the level of visits per 1,000 tourists per year at the Bhumi Merapi Agrotourism, which was done by grouping of several zones or districts. Based on the analysis, the highest visit rate came from Sleman Regency, which was 17.53%. Yogyakarta's visit rate was 15.91%. The level of tourist arrivals from Magelang Regency was 1.77%. The level of tourist arrivals from Klaten Regency was 2.56%. The level of tourist arrivals from Bantul Regency was 8.26%. The lowest visit level was tourists from Mojokerto Regency, which was 0.68%. Based on the analyzed data, an average visit rate of 4.91% was obtained. This value was used to calculate the economic value.

Table 5. Visit rates per 1000 population per year by zone of origin in 2018

| Zone          | Total (person) | Total population (person) | Visit level per 1000 population per year |
|---------------|----------------|----------------------------|------------------------------------------|
| Sleman        | 28             | 1.193.512                  | 17.53                                    |
| Kota Yogyakarta | 9             | 422.732                    | 15.91                                    |
| Klaten        | 3              | 1.167.401                  | 2.56                                     |
Based on the level of visits per 1,000 inhabitants per year that have been obtained from each zone, a multiple linear regression analysis was carried out with eight independent variables that were thought to influence the level of visits at the Bhumi Merapi agrotourism. Several factors were analyzed in this research, such as total travel costs, average monthly income, distance, education, ages, number of family dependency, visiting experience, and marital status. Assumption tests were analyzed, including normality, multicollinearity, and heteroscedasticity test, in order to ensure no errors in the regression model. Hence, the results are valid. After testing the classical assumptions, the ordinary model shows a heteroscedasticity problem hence the model used in this study was the logarithmic model, such as total variable cost of travel (X1), average income per month (X2), distance (X3), education (X4), age (X5), number of dependents of the family (X6). Based on the classical assumption test, the model in this study was normally distributed; there were no heteroscedasticity and multicollinearity problems.

3.7. Regression factors-factors influencing the level of visits in Bhumi Merapi Agrotourism

Factors that influence the level of visits in the Bhumi Merapi agrotourism were analyzed by multiple linear regression with the dependent variable was the level of visits per 1000 tourists per year and the independent variables were in the form of travel expenses, average income per month, distance, age, education, number of family dependents, visiting experience, and marital status. The results of the regression analysis are presented in Table 6.

| Variable           | Expected Sign | Coefficient | Probability |
|--------------------|---------------|-------------|-------------|
| Constanta          | +             | 5.8619      | 0.0195      |
| Ln Cost (X₁)       | -             | -0.6226 *** | 0.0013 ***  |
| Ln Income (X₂)     | +             | 0.4630 ***  | 0.0019      |
| Ln Distance (X₃)   | -             | -0.8661 *** | 0.0000      |

Table 6. Factors affecting the level of visit in Bhumi Merapi Agrotourism 2018
Based on the analysis results, the adjusted $R^2$ value obtained in the regression model was 0.7531 or rounded to 0.75. It means that 75% of the variation of the dependent variable (visit rate) can be explained by the independent variables in the model (travel costs, average income per month, distance, age, education, number of family dependents, visiting experience, and marital status). The remaining 25% of the variation was explained by other variables outside the model.

The probability value of F was 0.00, which means it was smaller than the alpha value. There was no influence of the independent variable on the dependent variable. The hypothesis was rejected. This value indicates that the independent variables jointly influence the dependent variable.

Based on the analysis results in Table 6., it can be seen from the results of the t-test that there are four independent variables that have a probability value of less than alpha, namely the cost of travel, income, distance, dependents of the family and visiting experience.

A probability value of travel costs was 0.0013, which means travel costs affect the level of visits in the Bhumi Merapi agrotourism with alpha 1%. The regression coefficient value was negative, that is equal to -0.6226. means there was an increase of travel costs by 1%, the visit rate will decrease by 0.62%. The travel costs were included for transportation in the form of fuel, vehicle rental, parking, toll fees, and vehicle repairs; consumption costs in the form of food and drink during travel or at tourist sites; and the cost of using rides and tourist facilities.

Previous studies on factors influencing tourist visits conducted by Muntoro (2009) on Tawangmangu Tourism Park and Lorosaputri (2014) on Kampoeng Kopi Banaran, and other similar studies indicate that travel costs are factors that negatively affect the level of visits [14] [15]. The results of the study were in accordance with the theory of demand, which states that the higher the price, the consumer will reduce the number of goods consumed.

The probability value of the income factor was 0.0019($P<1\%$), it means hypothesis was rejected. This shows that the average monthly income influences the level of visits to the Bhumi Merapi agrotourism. The value of the regression coefficient was positive at 0.463, which means there is a direct proportion between the average income and the level of visits. There is an increase of income by 1%, the tourist visit will increase by 0.46%. This shows that the higher a person's income, the higher one's tendency to make tourist visits at the Bhumi Merapi agrotourism.

### Table

| Variable                          | Coefficient | Significance | $t$-stat | $F$-stat | $F$-sig |
|----------------------------------|-------------|--------------|----------|----------|---------|
| Ln Year ($X_4$)                  | +           | 0.5292       | ns       | 0.1071   |         |
| Ln Education ($X_5$)             | +           | -0.8800      | ns       | 0.1511   |         |
| Ln Family member ($X_6$)         | -           | -0.0704      | **       | 0.0354   |         |
| Visiting Experience ($D_{PB}$)   | +           | 0.2949       | **       | 0.0256   |         |
| Marital status ($D_{SP}$)        | +           | 0.2536       | ns       | 0.4863   |         |
| Adjusted $R^2$                   |             |              |          | 0.7531   |         |

**Source:** Primary Data Analysis, 2018

Where:

- ***: Level of significance 99% ($\alpha = 1\%$)
- **: Level of significance 95% ($\alpha = 5\%$)
- * : Level of significance 90% ($\alpha = 10\%$)
- ns : Not significant
The probability value of the income factor was 0.009 (P<1%), it means the hypothesis was rejected. This shows that the average monthly income influences the level of visits to the Bhumi Merapi agrotourism. Income is closely related to economic activities, including recreational activities that require funds form part of income. The coefficient of income variable was positive, in accordance with the theory of demand, which means it is smaller than alpha 1%. Then H0 is rejected with (P<1%), it means the hypothesis was rejected.

The probability value of the distance factor was 0.000 (P<1%), it means the hypothesis was rejected. This shows that distance influences the level of visits in Bhumi Merapi agrotourism. The regression coefficient value was negative. There is an inverse relationship between the distances of the location with the level of visit. Every time the distance increases by 1%, the visit rate will decrease by 0.86%. This shows that the farther the distance of a visitor, the lower average chance of visiting the Bhumi Merapi agrotourism. In addition, the further distance the location of the tourist location tends to require higher transportation costs.

The probability value of the family dependency factor was 0.0354 (P<1%), it means the hypothesis was rejected. This shows that the number of family dependents influences the level of visits to the Bhumi Merapi agrotourism. The regression coefficient value was negative at -0.0704. There is an inverse relationship between the number of family dependents and the level of visits. There is an increase in the number of family dependents by 1%, the visit rate will decrease by 0.07%. Based on research, it is known that if a person has more family dependents, then it tends to minimize tourism activities because the funds are used for other needs.

Visiting experience shows that the tourist will visit more than once. It can illustrate customer loyalty and satisfaction. Consumer loyalty is described by a series of behaviours and habits [17]. The intended behaviour includes a desire to reuse a product or service, a willingness to inform others, and a loyalty to the product. Consumer loyalty is influenced by the satisfaction he gets after enjoying certain services or products.

Based on research, age, education, and marital status did not affect the level of visits to the Bhumi Merapi agrotourism. That is because factors of age, education, and marital status of visitors had a homogeneous distribution. The rides and tourism facilities at Bhumi Merapi agrotourism can be used by visitors in every various ages namely children, adolescents, and adults.

3.8. The Economic Value of Bhumi Merapi Agrotourism
This study used a travel cost method to determine the direct use-value of the Merapi Bhumi agrotourism. The travel cost method considers the zoning aspect in the form of a regency or city to calculate the economic value of agrotourism with the assumption that tourists from the same area tend to spend almost the same travel costs to make a tour in the Bhumi Merapi agrotourism.

The economic value of Bhumi Merapi agrotourism was calculated by assuming that other variables besides travel costs were of a fixed value. The equation used in the calculation of the economic value of Bhumi Merapi Agrotourism was an ordinary model without a logarithmic form. Based on the calculation results, the value of willingness to pay visitors to the Bhumi Merapi agrotourism amounting to Rp4,724,179.00 per inhabitants per year. The actual paid was IDR 3,782,456.00 per 1000 inhabitants per year. Consumer surplus was the difference between the value of willingness to pay with the actual paid (“value paid” in graph) so that the value of consumer surplus was Rp941,723.00 per 1000 population per year. This value was obtained from an average visit rate of 4.91, as shown in Figure 1.
Figure 1. shows the consumer surplus of Bhumi Merapi Agrotourism
Source: Primary and Secondary Data Analysis, 2018

Figure 1. shows the consumer surplus of Bhumi Merapi agrotourism visitors. The trapezoid-shaped area BCD0 was the value of willingness to pay by visitors. The ACD0 quadrilateral area was the actual paid when the visit rate was 4.91, and the cost of the trip at that visit level was IDR 3,782,456.47. The consumer surplus is indicated by the shaded area, the ABC triangle.

The economic value per 1000 people obtained if converted to per individual, the value of willingness to pay was Rp4,724.18 / year. The actual paid per individual was IDR 3,782.46 / year, and the consumer surplus value was IDR 9,41.72 / year. This value can increase along with the increasing number of visits to the Bhumi Merapi agrotourism.

The surplus-value of Bhumi Merapi agrotourism consumers, when it is compared to the value of willingness to pay was 0.20. The comparison shows that the advantages (benefits) obtained by visitors amounted to 20% of the total willingness to pay. Thus, the manager has the opportunity to increase the price of a ticket or facility while still considering the quality of services provided. With the addition of various facilities, vehicles, and improved service quality, the price increase will not reduce the consumer surplus of Bhumi Merapi Agrotourism hence the willingness to pay by visitors is also increasing. The higher value of consumer surplus, the higher value of benefits which is obtained by visitors.

The economic value per 1000 inhabitants was used as the basis for determining the total value of Bhumi Merapi agro-tourism. Calculation of the total value of Bhumi Merapi agrotourism was to multiply the average economic value per 1000 population by the total population of the entire zone. The total population of the 14 zones used was 12,917,007. The average value was the result of the previous calculation (in units of Rupiah per 1000 residents per year), which includes the consumer surplus, willingness to pay, and the actual paid.

The calculation results show a total willingness to pay was Rp.61,022,254,800.00 / year. It means that visitors are willing to pay with this value to benefit from the existence and tourism activities carried out at the Bhumi Merapi Agrotourism. The value paid by visitors to the Bhumi Merapi Agrotourism was IDR 48,858,016,700.00 / year. The value of the consumer surplus was IDR 12,164,238,100.00 / year, as presented in Table 7.
Table 7. Total value of Bhumi Merapi Agrotourism in 2018

| Information          | Average value (Rp / 1000 inhabitants / year) | Total population (person) | Total value (Rp / Year) |
|----------------------|---------------------------------------------|---------------------------|------------------------|
| Willingness to Pay   | 4,724.179                                   | 12,917.007                | 61,022,254.800         |
| Value Paid           | 3,782.456                                   | 12,917.007                | 48,858,016.700         |
| Consumer Surplus     | 941,723                                     | 12,917.007                | 12,164,238.100         |

Source: Primary Data Analysis, 2018

Previous research conducted by Maharani on Mekarsari Tourism Park showed a total consumer surplus-value of Rp 1,230,000,000,000.00 with a total value of willingness to pay of Rp3,910,000,000,000.00 [18]. The value of consumer surpluses and the willingness to pay is lower than WTP in Mekarsari Tourism Park because Mekarsari Park has been established for more than 20 years. It has been widely known by the wider community.

Bhumi Merapi has opportunity to increase the number of visits and increase the economic value of the environment. The better development strategy will increase the attractiveness of Bhumi Merapi. In addition, the addition of various transportation and supporting facilities, more intensive information dissemination is needed hence it will attract people from various areas to visit Bhumi Merapi agrotourism. Various promotional media can be utilized both internet and print media. Visitor satisfaction also needs to be considered because it affects the number of visitors in the future. Satisfaction level of a tourist will encourage visitors to make a return visit.

4. Conclusion

Most of visitors wa for recreation in groups of less than or equal to 10 people. They come from the Sleman district and plan to return visit. The level of income and visiting experience had a positive effect while the cost of travel, the distance, and the number of family dependents had a negative effect on the level of visits to the Bhumi Merapi Agrotourism. In addition, the economic value of Bhumi Merapi Agrotourism consists of total willingness to pay, amounting to Rp 61,022,254,800.00 / year, while the total actual paid by visitors was Rp 12,164,238,100.00 / year.

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