Economic Valuation of Kebun Buah Mangunan at Sub-district Dlingo, Bantul

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Abstract. Agro-tourism is related to tourism in the agriculture sector that has distinctive characteristics as one that managed in Subdistrict Dlingo in Bantul named Kebun Buah Mangunan that attracts tourists and travelers both from locals and outside the region of Yogyakarta. This research aims to determine the average value of the Willingness to Pay (WTP) of tourists who visited the Kebun Buah Mangunan, the factors that influence the WTP, and the value of consumer surplus. The primary method used in this study is the quantitative analysis, while the technique in determining the location of research with a purposive sampling method and the sampling method is the accidental sampling. The primary data was collected from 51 respondents of tourists who had and are visiting the Kebun Buah Mangunan. The data was collected through observation, interviews, notes, and google form questionnaires. The Contingent Valuation Method (CVM) and OLS multiple linear regression analysis is used to determine the average WTP value and the factors that influence tourist WTP, respectively. Besides determining the consumer surplus, linear regression is used between the number of tourists and the magnitude of the tourist’s WTP. This research showed that, on average, visitors of Kebun Buah Mangunan willing to pay IDR 27,333.32 per person per visit. The visitor’s income, benefits, importance, and day of visit (age and participation) can increase (decrease) the value of WTP. The research also finds that the tourist’s consumer surplus is IDR 12,741.68 per person per visit.

1. Introduction

Agro-tourism is tourism related to the agricultural sector and can include plantations or farms that have unique characteristics because most of the locations related to this tourism are placed in rural areas. The most agro-tourism in Indonesia is in the form of tea plantations, coffee, and fruits, among others [1]. Agro-tourism can also be defined as a business in agriculture in the form of services. These services can be in the form of beauty and serenity [2]. Agro-tourism can be interpreted as a form of placing the agricultural sector as a primary sector into the tertiary sector, namely tourism [3].

Dlingo sub-district is one of the tourist destinations for people around and outside Yogyakarta. It has an attraction for forest tourism and has a beautiful view that can be seen from the top of the hill.

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The existence of this tourism area has a role besides being part of recreation, but also as an area for the conservation of natural resources. The role of natural resource conservation, which is one of the tourist areas, will be calculated for its economic value using the Contingent Valuation Method (CVM), which can then determine the factors that can influence the amount of a person’s Willingness to Pay (WTP).

The economic value of a tourist area can be useful information not only for management and planning but also as a marketing strategy for the tourism area. The CVM method is impressive when compared to other methods because it can describe a preference of each individual in terms of availability to pay for or improve environmental quality and can also see the availability of a person to accept the impact resulting from decreased environmental quality. Also, research on the economic valuation of the Kebun Buah Mangunanhas never been done before, so it is necessary to research the economic valuation of natural resources in the tourist area of Kebun Buah Mangunan.

The problems that exist in the tourist area of the Kebun Buah Mangunan are the cleanliness of the tourist area, which is still not clean, the available facilities are also poorly maintained, and the manager focuses more on tourism rather than cultivating fruit plants which are still relatively small in number. The problem of facilities and tourist objects is an important thing that needs to be fixed so that tourists have the desire to come back to the tourist area of Kebun Buah Mangunan at a later date. Therefore, the participation of tourists is needed in improving facilities and preserving tourism objects in the form of fruit gardens. The purpose of this study, among others, was to determine the WTP value of tourists visiting the Kebun Buah Mangunantourist area, knowing the factors that influenced the WTP of Kebun Buah Mangunantourists with CVM, and knowing the size of the consumer surplus of tourists visiting the Kebun Buah Mangunantourist area.

2. Literature Review

The factors that influence the management of an agro-tourism destination in the Kebun Buah Mangunan are age, education, income, participation, benefits, importance, existence, number of family members, gender, and day of visit. Age is the life span of someone who gets the year of his birth. Education is level of education as measured by a primary school. Income is the total income of household members including of husband, wife, and children who are still dependent on parents who are obtained from main or side jobs for one year. Participation is a form of tourist’s willingness to conserve natural resources and the environment. Benefits are a utility of Kebun Buah Mangunan by local residents. Importance was measure by the extent to which tourist's need for a tourist area. Existence is something that appears, arises, or be present in society and has an influence on a person at present and in the future. The number of family members is consisting of the head of the family, wife, and children. Gender is the difference in form, trait, and biological function between men and women. Day of visit was differentiated into normal days (weekdays) which consist of Monday to Friday and holidays (weekends) which consist of Saturday and Sunday.

2.1. Economic Valuation

Economic valuation is a measurement of the value of benefits through the economic value approach of natural resources. WTP and WTA are based on the amount of money that users are willing to pay or are willing to receive in relation to taking advantage or profit from these natural resources [4]. By implementing an approach to the economic value of a natural resource benefit, it is possible to estimate the value of the benefits that will be obtained and the value of the benefits that are lost if there is a change in the function of the conservation area of natural resources and the environment which can be known quantitatively and measured.

CVM can be used to analyze policy and academic research. In using this method to evaluate WTP, it is not only used for developed countries but is also used in developing countries. Also, the use of CVM can be considered as the best method in estimating the total non-market value of the economy. It has also been proven by environmental and resource economists as well as policy analysts in
developing countries where the results show a positive response because CVM surveys are easy to carry out and generally not difficult to understand [5].

2.2. Willingness to Pay

The WTP model assumes that an individual is willing to pay a bid amount if the individual gets value by increasing conservation and maintenance that can result in satisfaction for that individual [6]. Also, this research uses the contingent method with econometric techniques, namely the Tobit econometric model and the Ordinary Least Squares (OLS), to calculate WTP, which is then aggregated into the Total Economic Value (TEV) of water services in the Governor of Ramallah, Palestine. The TEV obtained was NIS 627 per year [5]. Research related to the services produced by forests in northern Jordan shows that the forest plays a role in addition to being a place of conservation, it can also play a role in providing food for community livestock living around the forest. The results obtained are in the form of present value benefits obtained from the WTP value that respondents are willing to contribute to maintaining forest ecosystem services. The amount of this value is JD 3,569,556 per year [7].

WTP is to assess the increase in biodiversity in New Zealand’s forests by looking at the WTP value of tourists. WTP obtained is $24 per year for increased Falcon or the equivalent of IDR 342,720 per year and Brown Kiwi species of $21 per year or equivalent to IDR 299,880 per year [8]. In analyzing the willingness of visitors to pay retribution for tourist objects in Banda Aceh City, it was found that the number of visitors who stated their willingness to pay tourist attraction fees was 80% where the value was IDR 32,967.5 with a total WTP value of IDR 825,922,249.9. The amount of the average value of the willingness to pay from visitors can be used as a reference in determining the retribution price for tourist attractions in the city of Banda Aceh [9]. Efforts to improve the environmental quality of tourism villages in Sleman Regency after the eruption of Mount Merapi can be used CVM method and OLS multiple linear regression. This method can estimate the WTP value for environmental improvement. Then the average WTP yield was IDR 6,740 per visit per respondent [10].

2.3. Factors that Influence WTP

Research with CVM on mangrove restoration in Kamujan Island [6] found that the variable income, education level, marital status, and bid value had a significant positive effect on the CVM value. The contingent valuation method can be used to measure WTP, WTA, and WTS in the context of a program to maintain the cleanliness of the Cikapundung River environment in Bandung. The variables that have a significant effect on this research are gender, education, occupation, income, expenditure, length of stay, and house distance [11]. CVM can be used to measure the effect of behavior on a person’s willingness to pay in terms of forest recreation costs. The results obtained indicate that respondents with a supportive attitude are more willing to pay for recreation than respondents who have an oppositional attitude. Other variables that have a significant positive effect on the WTP score are attitude, income, and frequency of visits, while those that have a significant adverse effect are age, attitudes, and student status [12]. The direct and indirect benefits felt by the surrounding communities relating to the services provided by the forest in northern Jordan can be investigated using a contingent method. The results show that the variables that are firmly and positively related to the value of WTP are household income, education, sex, forest type, plants collected, and livestock size [7].

CVM, multiple linear regression, and binary logistic regression were used to analyze the willingness of visitors to pay retribution for tourist objects in Banda Aceh City [9]. The variables that have a significant positive effect on the value of the respondent’s willingness to pay on the cost of the tourism object retribution are gender, age, and education. Also, there is research on the influence of age, education, income, number of family dependents, visit fees, frequency of visits to WTP to improve the environmental quality of tourist villages in Sleman Regency after the eruption of Mount Merapi [10]. The results show that age and income have a significant positive effect, while education and the number of family dependents have a significant adverse effect.
2.4. Consumer Surplus

Consumer surplus is the difference between the amount paid by the visitor and the visitor’s willingness to pay. Research on the results of the consumer surplus of tourists visiting the tourist area of Goa Pindul is IDR 79,677, and the annual consumer surplus is IDR 10,399,524,104 per year [13]. Also, an economic valuation was carried out for an environmental service-based tourism area at Batu Karas Beach, Panganduran Regency, which obtained a consumer surplus of IDR 566,183, person per year, which could affect economic benefits, to improve the socio-economy of the surrounding community [14]. Consumer surplus can reflect the benefits that a person can get from being able to buy all units of goods at a low price level. The tourist consumer surplus obtained from the tourist area of Parangtritis Beach, Bantul, and Yogyakarta is IDR 7,376.80 [15].

The effect of visiting days on consumer surplus can be related to the WTP of tourists because the consumer surplus can be seen from the WTP of tourists who visit on certain days [16]. The consumer surplus for the Gembira Loka Zoo tourism object shows that there are more visits on weekdays than on holidays (weekends). It makes the consumer surplus value on weekdays bigger, which is IDR 1,953,900 compared to holidays IDR 1,903,900. The research on the tourist attraction of Gembira Loka Zoo shows that the WTP value of tourists is IDR 49,198, and the consumer’s surplus is IDR 4,588,171 [17]. Also, there is the same study in order to provide an economic valuation of the tourist area of Tamansari Yogyakarta [18]. The WTP value of tourists is IDR 43,833, and the consumer surplus is IDR 2,734,791.

3. Method

3.1. Sampling Method

The research location was determined by using a purposive sampling method, which is a nonrandom technique. The purposive sampling method is carried out deliberately by researchers based on the researchers’ considerations and following the research objectives [19]. This research was conducted in the tourist area of Kebun Buah Mangunan, Dlingo District, Bantul Regency with the consideration that this location is a nature-based tourism area which according to tourism statistics in 2019 [20] and is the most visited tourist attraction after the Mangunan Pine Forest Area, Parangtritis Beach, and Samas Beach.

Data were collected by convenience sampling or often referred to as accidental sampling. This method does not provide equal opportunities for every respondent in a population to be sampled in the study. Convenience sampling is based on the convenience of researchers because it considers the criteria and the ease with which researchers take samples from a population [21]. Sampling using accidental sampling can sometimes occur accidentally because the sampling is carried out subjectively within the scope of the study, and the sample is not randomly or accidentally found at the research location [19]. In this study, the samples taken were only in the tourist area of the Kebun Buah Mangunan and were randomly selected according to the convenience of the situation and the conditions of the researchers. The requirements used for respondents are adults around the age of 25 years and over and have a family.

Samples were taken as many as 51 respondents, where 36 respondents were interviewed directly at the Kebun Buah Mangunan, and 15 respondents were conducted online by filling out a questionnaire via a google form. Keeping in mind the convenience of taking tourist samples due to the constraints of the COVID-19 pandemic, online sampling was carried out using the convenience sampling method or accidental sampling with Google form media, where the google form questionnaire was distributed via WhatsApp and Line social media so that respondents who had visited the Kebun Buah Mangunan in the 2019-2020 tofu range can fill out the questionnaire. The samples were taken on weekdays and weekends. The sampling on weekdays and holidays (weekends) is intended to see the difference in the number of tourists visiting on weekdays or holidays and their reasons for visiting these days. The game bidding method is a bargaining technique [22] to find out the WTP value of tourists and is carried out during the direct interview in the Kebun Buah Mangunan area, while for online tourist data
collection, the game bidding technique is done by writing the number of tourist bid on the question has been provided in the google form questionnaire.

3.2. Data Analysis Method

3.2.1. Likert Scale

In measuring a person’s attitude using a Likert scale, it is necessary to determine the kinds of attributes or variables. In this study, the variables to be measured using a Likert scale were the variables of participation, benefits, interests, and existence. Likert scale is useful for measuring attitudes, opinions, and perceptions of a person and even groups of people. The size on the Likert scale varies from 3, 5, 6, even 7, which can be adjusted according to the needs [23].

3.2.2. Validity

Validity has the meaning of strength in providing conclusions, inferences, or the proportion of research results that are conducted and closer to the truth. In conducting a validity test, a measurement scale can be said to be valid if the scale is used to measure what should be measured, and the resulting inference is close to the truth [24].

3.2.3. Reliability

Reliability can be interpreted in general as the consistency of the results of the measurement of the same thing if done in a different time context. The reliability test concentrates on the problem of measurement accuracy and its results because reliability reflects the consistency and stability of the value of a particular measurement result whenever a measurement is carried out on the same thing [24].

3.2.4. Estimate WTP with Contingent Valuation Method (CVM)

WTP of tourists who visiting Kebun Buah Mangunan is estimated using the CVM consisting of five stages which will be described as follows [22]:

1. Make a Market Hypothesis

   The market hypothesis is made at the beginning before getting the WTP value by making a questionnaire that contains complete information about the tourism conditions of Kebun Buah Mangunan.

2. Obtaining WTP Value

   The WTP value in this study was obtained through direct surveys with questionnaires and direct interviews with respondents using a bidding game technique. Questions posed to respondents can be stopped if the value agreed upon by the respondent has been obtained.

3. Calculating the Estimated Mean WTP

   After the survey is carried out, the next step is to calculate the average WTP value for each tourist. This value is calculated based on the WTP value obtained in the second stage. After finding the amount of WTP for each tourist, the WTP calculation can be done by calculating the average (mean). The average results obtained will later reflect the economic value of the Kebun Buah Mangunan. The following is the formula for calculating the average WTP value [22]:

\[
    WTP = \frac{1}{N} \sum_{i=1}^{n} Wi
\]

where:

- \( WTP \) = Average value of WTP
- \( Wi \) = value of the WTP ith
- \( N \) = Number of samples
- \( i \) = Respondent i who is willing to pay (i = 1, 2, ..., n)
4. Estimating the WTP Curve

The WTP curve is formed based on the WTP value of tourists, which illustrates the relationship between the level of WTP paid as the Y-axis and the number of tourists willing to pay at that WTP level (X-axis).

5. Evaluating the Implementation of CVM

The last stage is to evaluate the implementation of the CVM. In evaluating the implementation of CVM, it can be seen from the results of the Multiple Linear Regression Analysis, namely the results of Adjusted $R^2$.

Before the variables of participation, benefits, interests, and existence were regressed with the other five variables (age, gender, number of family members, income, and education), the data were transformed from ordinal data to interval data. Transformation of ordinal data to intervals can be done in Excel, which is called the Method of Summated Ratings or, more popularly known as the Likert model, scaling is a method of scaling an attitude statement that uses the distribution of responses as the basis for determining the scale value. In scaling using this method, respondents were asked to state their opinions in five types of answer categories [25]. After the ordinal data is transformed into intervals, the next step is to perform OLS multiple linear regression.

The data analysis method used is Ordinary Least Squares (OLS). An assumption test is conducted to see whether, in an OLS linear regression model, there are problems with classical assumptions. Some of the standard assumption tests used are normality, multicollinearity, autocorrelation, and heteroscedasticity tests [26]. The following is a multiple linear regression equation of the WTP value of tourists:

$$\log Y_1 = \beta_0 - \beta_{1.1} \log X_{1.1} + \beta_{1.2} \log X_{1.2} + \beta_{1.3} \log X_{1.3} + \beta_{1.4} \log X_{1.4} + \beta_{1.5} \log X_{1.5} - \beta_{1.6} \log X_{1.6} + \beta_{1.7} \log X_{1.7} - \beta_{1.8} \log X_{1.8} + \beta_{1.9} D_1 + \beta_{1.10} D_2 + \epsilon$$

Where:

$Y_1 =$ WTP value of tourists visiting Kebun Buah Mangunan
$X_{1.1} =$ Age (years)
$X_{1.2} =$ Education (years)
$X_{1.3} =$ Income (IDR)
$X_{1.4} =$ Someone’s participation in the tourism preservation of the Kebun Buah Mangunan
$X_{1.5} =$ Benefits of Kebun Buah Mangunan
$X_{1.6} =$ Interest of the Kebun Buah Mangunan
$X_{1.7} =$ The existence of Kebun Buah Mangunan
$X_{1.8} =$ Number of Family Members (person)
$D_1 =$ Dummy gender (score 1 for men and 0 for women)
$D_2 =$ Dummy day of visit (worth 1 for weekends and 0 for weekdays)
$\beta_0 =$ Inetrssep
$\beta_{1.1}, \beta_{1.2}, ..., \beta_{1.10} =$ Regression Coefficient
$\epsilon =$ error

3.2.5. Estimate the Consumer Surplus

The calculation of consumer surplus can be done using the WTP curve from the regression equation between the number of tourists and the WTP value of tourists, where the number of visitors is the X-axis, and the average WTP of tourists is the Y-axis. The regression equation then produces a linear equation:

$$Y_2 = aX_{2.1} + b.$$
From this linear equation, it can be entered the average WTP of tourists, so that it can be seen the amount of surplus of tourist consumers visiting the tourist area [13].

4. Result and Discussion

Based on the validity test of the participation variable, benefits, interests, and the existence of the total correlation value for each indicator variable, it is significant with an alpha of 10%. Also, the reliability test based on the Cronbach Alpha value is known to be higher than 0.6. Thus, it can be concluded that the four variables are valid and reliable.

4.1. WTP of Visitor and Preservation of Kebun Buah Mangunan

The estimated average WTP of tourists visiting Kebun Buah Mangunan is calculated using the CVM method by finding the average value of the total WTP of all tourists (Table 1).

Table 1. Distribution of WTP Tourists to the preservation of the Kebun Buah Mangunantourism area.

| Value of WTP (IDR per visit) | Frequency (people) | Percentage (%) | Average WTP (IDR) |
|-----------------------------|--------------------|----------------|-------------------|
| 5,000                       | 1                  | 1.96           | 98.04             |
| 7,000                       | 1                  | 1.96           | 137.25            |
| 10,000                      | 8                  | 15.69          | 1,568.63          |
| 12,000                      | 1                  | 1.96           | 235.29            |
| 15,000                      | 11                 | 21.58          | 3,235.29          |
| 20,000                      | 8                  | 15.69          | 3,137.25          |
| 25,000                      | 5                  | 9.80           | 2,450.98          |
| 30,000                      | 3                  | 5.88           | 1,764.71          |
| 35,000                      | 2                  | 3.92           | 1,372.55          |
| 40,000                      | 4                  | 7.84           | 3,137.25          |
| 50,000                      | 3                  | 5.88           | 2,941.18          |
| 70,000                      | 1                  | 1.96           | 1,372.55          |
| 100,000                     | 3                  | 5.88           | 5,882.35          |
| Total                       | 51                 | 100.00         | 27,333.32         |

Based on table 1, it can be seen that the amount of tourist willingness to pay varies, the average tourist WTP value is IDR 27,333.32. This value can reflect the considerable willingness of tourist to pay for the preservation of tourist areas in the hope that they can return to the Kebun Buah Mangunanone day. The tourists hope that with the WTP value they pay, the services and facilities (toilets, prayer rooms, parking lots, handrails, gazebos, etc.) provided by the management of the Kebun Buah Mangunan can be added and improved. After the average WTP value was obtained, the WTP curve can be drawn. The WTP curve and the trend of the WTP curve of tourists visiting Kebun Buah Mangunan can be seen in Figure 1.
Based on Figure 1, it can be seen that the trend of the WTP curve where the number of tourists with the highest WTP will be smaller. However, based on the WTP value obtained in the range of IDR 5,000 to IDR 20,000 and the range of IDR 40,000 to IDR 100,000, the WTP value has fluctuated. It is because several factors have a significant effect on WTP, one of which is income [6]. Some tourists who have high income will provide an immense WTP contribution, thus indicating that tourists are willing to pay a higher WTP in order to preserve the tourism area of Kebun Buah Mangunan.

4.2. Factors that Influence WTP’s Tourist

Before OLS regression, a classic assumption test was performed, namely the normality test, heteroscedasticity, multicollinearity, and autocorrelation. Based on the results of the classical assumption test, it is found that the regression model used has met the classical assumption test.

Table 2. Factors Affecting WTP.

| Variable                        | Expected Sign | Regression Coefficient | Probability t |
|---------------------------------|---------------|------------------------|---------------|
| Constant                        | +             | -9.794                 | 0.022         |
| Log(Age)                        | +/-           | -0.937**               | 0.031         |
| Log(Education)                  | +             | 0.068                  | 0.833         |
| Log(Income)                     | +             | 0.549***               | 0.000         |
| Log(Participation)              | +             | -2.280**               | 0.004         |
| Log(Benefit)                    | +             | 4.198***               | 0.000         |
| Log(Importance)                 | +             | 1.117**                | 0.041         |
| Log(Presence)                   | +             | 0.650                  | 0.175         |
| Log(Number of family member)    | -             | -0.246                 | 0.255         |
| Dummy (Gander)                  | -             | 0.091                  | 0.355         |
| Dummy (Visit day)               | +             | 0.557*                 | 0.073         |

Table 2 shows that the Adjusted R2 value is 0.546, which means that 54.60% of the variation in the WTP variable can be explained by the independent variables in the model, while 45.40% of the variation is explained by other variables not included in the model. Also, it can be seen that the F-
statistic Probability value is zero. This value is smaller when compared to alpha 10%, which means that together, all independent variables have a significant effect on the dependent variable (WTP). Based on the t-test, income, benefits, interests, and day of the visit have a significant effect on the alpha level of 10% with a positive correlation. That is, income, benefits, interests can increase WTP, and tourists visiting Kebun Buah Mangunan on holidays (weekends) have a higher number of WTPs than tourists visiting on weekdays (weekdays). It is in line with previous studies [6], [16], [18]. Age and participation are also significant at the alpha level of 10% but with negative correlation. Thus it can be concluded that age and participation can reduce WTP according to previous studies [12], [17]. The higher the age, the WTP of a person for the preservation of tourist areas will be lower due to the number of family members that a person can consider in giving the amount of the WTP value. The low participation of tourists visiting the Kebun Buah Mangunantour also causes the WTP value of tourists to be little. It is because tourists think that cleanliness, availability of facilities, and preservation of tourist areas are the responsibility of the tourism area manager.

4.3. Consumer Surplus

The consumer surplus curve can describe the benefits that tourists get from a tourist area. This benefit can be measured by knowing the difference between the number of tourists willing to pay and the real amount that should be paid [15]. The X-axis on this curve is the number of tourists, while the Y-axis represents the amount of WTP paid by tourists. The curve of consumer surplus visiting Kebun Buah Mangunan can be seen in Figure 2.

![Figure 2](image_url)

**Figure 2.** The curve of tourist’s consumer surplus of Kebun Buah Mangunan.

In Figure 2, the green part is a consumer surplus of the average WTP value of tourists. The calculation of consumer surplus can be calculated based on the results of the regression equation between the WTP value and the number of tourists [13]. The graph of the results of WTP and the number of tourists (Figure 2) produces a linear equation, namely \( Y = -1999.4X + 40075 \). Based on the calculation by entering the average WTP value of IDR 27,333.32 into the equation \( Y \) will produce a value consumer surplus in the tourist area of Kebun Buah Mangunan, amounting to IDR 12,741.68 per person per visit.

5. Conclusion

This research concludes that the average value of the WTP of tourists visiting the Kebun Buah Mangunanis IDR 27,333.32 per person per visit. The factors that influence the WTP of tourists visiting the Kebun Buah Mangunan are age, income, participation, benefits, interests, and days of the visit.
Furthermore, there was a surplus of consumer tourists that visited Kebun Buah Mangunan with the amount of IDR 12,741.68 per person per visit.

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