

# Determinant of Willingness to Pay and Economic Value for Ecotourism Object Using Contingent Valuation Method : The Case of Rawapening, Semarang Regency, Central Java, Indonesia

Sri Subanti

Department of Statistics  
Universitas Sebelas Maret  
Surakarta, Indonesia  
sri\_subanti@yahoo.co.id

Inaki Maulida Hakim

Department of Industrial Engineering  
Universitas Indonesia  
Depok, Indonesia

Ahmad Daerobi

Department of Economic Development  
Universitas Sebelas Maret  
Surakarta, Indonesia

M Safar Nasir, Arif Rahman Hakim

Department of Economic Development  
Universitas Ahmad Dahlan  
Yogyakarta, Indonesia

**Abstract**—The purpose of this study is to determine the factors of willingness to pay for quality improvement and to estimates of economic value for ecotourism object in Rawapening, Semarang Regency, Central Java Province, Indonesia. This study use contingent valuation method. The study uses lake visitors were surveyed regarding their willingness to pay for ecological function. The study was found significant factors affecting the probability of individuals to be willing to pay are the nominal amount bid only. The economic value of ecotourism was estimated at Rp 2,875 billion for total benefit per year. Recommendation from this paper, the local government should raise the price of an entrance fee in Rawapening.

**Keywords**—willingness to pay, economic value, ecotourism, contingent valuation method, rawapening

## I. INTRODUCTION

Rawapening located in Semarang Regency, Central Java Province, which is physically located in four districts, including District Banyubiru, District Tuntang, District Bawen, and District Ambarawa. Rawapening have various and unique potential tourism. The main potential are interesting views, includes direct view or indirect view to Rawapening. Besides that, another potential tourism in Rawapening, likes agro tourism, cultural tourism, and antique train tourism [4,7]. As we know, the development of ecotourism object, such as Rawapening, usually treated as public goods. Ideally, it must treated as economic goods. If this treatment applicated in rawapening development so it can keeps diversity for natural attractions in rawapening [8]. Based on this background, the purpose of this study is to determine the factors of willing to pay a certain nominal value for quality improvement and to estimate the economic value in Rawapening.

## II. METHODS

**Data.** The data used in this paper come from visitors in Rawapening. Each visitors were chosen as respondents for interview. Totally, we distributed 150 questionnaires and only 112 questionnaires returned. Each questionnaire have five sections, it covering (1) information for rawapening and research purposes, (2) demographic characteristics of respondents, (3) respondents perceptions for rawapening, and (4) respondents rating for rawapening development with hipotetical condition.

**Contingent Valuation Method and Approach.** To measure individual's WTP, this survey employs a dichotomous choice. Respondents in the DC approach are asked to accept or reject a suggested price under hyphothetical market situation. They only need to answer "yes" or "no" when presented with a price. It is easier for respondents to answer because respondents are familiar with this methods [2,5,6].

In contingent valuation method, payment option has very important role to represents willingness to pay of respondents. Many alternatives can be used, such as entrance fees, sales tax, utility bills, and others. This study used entrance fee because an entrance fee could be a logical and realistic payment vehicle for users of recreational services [1,3]. To construct the question in the form of contingent valuation, we apply the question like this "if the Rawapening will improved to be better condition such as environment, natural resources, fishing, culture, swimming, farming, and recreation. Will you agree if the entrance fee increase amount of Rp Y, - per trip?".

TABLE I. DESCRIPTION OF VARIABLES

Variable	Description
Y	dependent variable, 1 if the respondent received an entrance fee, 0 if the respondent refused an entrance fee
BID	Offer admission to respondent for a given market hypothesis
INCOME	Income respondent per month
GENDER	Sex, 1 if male, 0 if female
EDUC	Time attained for formal education
AGE	Age

[1] In contingent valuation method, we have a binary choice as dependent variable so there are two options for estimate this case, namely logit and probit model. This study used logit model. In logit model, individuals who are faced with a choice of whether to accept or reject the bid level market hypothesis, would have a probability (Pi), where the individuals who will receive offers fee entrance could be expressed in logit model as follows:

$$P_i = E(Y_i = 1|X_i) = \frac{1}{1 + e^{-(\beta_1 + \beta_2 X_i)}} \quad (1)$$

Equation (1) can be rewritten as

$$P_i = \frac{1}{1 + e^{-Z_i}} = \frac{e^{Z_i}}{1 + e^{Z_i}} \quad (2)$$

Where  $Z_i = \beta_1 + \beta_2 X_i$ .

If  $P_i$  identified the probability of individuals who will receive offers fee entrance so the probability of individuals who will not receive offers fee entrance (1- $P_i$ ) are

$$1 - P_i = \frac{1}{1 + e^{Z_i}} \quad (3)$$

Then,

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{-Z_i}}{1 + e^{Z_i}} = e^{Z_i} \quad (4)$$

If we take natural log for equation (4), we get

$$L_i = \ln = \left( \frac{P_i}{1 - P_i} \right) = Z_i = \beta_1 + \beta_2 X_i \quad (5)$$

L is log form odds with linear in X and parameters. L called logit then equation (5) are logit model. From equation (5), the model for this study as follow

$$Y_i^* = \beta_0 + \beta_1 Bid_i + \beta_2 Income_i + \beta_3 Gender_i + \beta_4 Educ_i + Age_i + u_i \quad (6)$$

Logit model in equation (6) then estimated using the method of maximum likelihood (ML), which is a technique commonly used to estimate the logit model. There are three procedure to test this model, (1) individual test, this test compares p value with alpha ( $\alpha$ ) and this test uses two way hypothesis, (2) overall test, this compares likelihood ratio statistics with chi squared, and (3) godnes of fit test, this test uses Pseudo R-Squared. The description of the variables used in equation (6) will be explained in the table 1.

### III. RESULTS AND DISCUSSION

Based on table 2, we can be known that the factors that influence the willingness of the respondents accepted the offer price of entrance fee in the market to hypothesize scenarios in

Regions Rawapening attractions are offering a nominal admission price to a market hypothesis that is given to the respondent (bid). Another variable is not significant, such as age and sex suggest that visitors who come into a tourist attraction in the area Rawapening not segmented in the range of age groups and specific gender specific, as shown in the above demographic profile.

TABLE II. ESTIMATION RESULTS

Variabel	Coefficient	Std.Error	Z-stat	Sign
bid	0.003	0.001	5.100	***
income	-3.35E-07	4.22E-07	-0.790	
gender	-0.329	0.413	-0.800	
educ	-0.267	0.289	-0.920	
age	0.009	0.034	0.260	
_cons	0.377	1.366	0.280	
Number of obs	112	Prob > chi2		0.000
LR chi2(5)	45.870	Pseudo R2		0.330

\*\*\*=sign.  $\alpha=1\%$ ; \*\*=sign.  $\alpha=5\%$ ; \*=sign  $\alpha=10\%$

In Table 3, we show that the demographic profile of respondents, the proportion of male respondents (55,36%) is higher than female respondents (44,64%). The marital status of respondents with married status represent 61,61%. It's greater than others, represent 38,39% of respondents. Age groups were also relatively distributed, except for people age 46 – 55 or older. Majority respondents have attended senior high school, eventhough many respondents have attended colleges or university graduates. Respondents that have attended senior high school, represent 58,04% of respondents, whereas 31,25% of the respondents had colleges or universities graduates.

**TABLE III. DEMOGRAPHIC PROFILE OF RESPONDENTS IN RAWAPENING**

Characteristics	Freq.	%
<b>Sex</b>		
Female	50	44.64
Male	62	55.36
<b>Age</b>		
16 - 25	34	30.36
26 - 35	57	50.89
36 - 45	14	12.5
46 - 55	6	5.36
> 55	1	0.89
<b>Education</b>		
Junior High School or Less	12	10.71
Senior High School	65	58.04
Diploma	12	10.71
Sarjana	23	20.54
<b>Respondent Origins</b>		
Semarang Regency	82	73.21
Others	30	26.79
<b>Monthly Income</b> ( 1US\$ = Rp 13000 )		
<= 1,00 million	9	8.04
1,01 - 2,0 million	91	81.25
2,01 - 3,0 million	10	8.93
>= 3,51 million	2	1.79
<b>Marital Status</b>		
Married	69	61.61
Others	43	38.39

From respondent origins, majority of respondents came from Semarang Regency (73,21%) than others (26,79%). Characteristics with monthly income of below 1 million rupiah and 1,01 – 2,0 million rupiah accounted for 8,04% and 81,25%. Then, respondents with incomes more than 2,01 and less than 3,0 million rupiah represented 8,93%. Only 1,79% of respondents had incomes over 3,51 million rupiah.

Table 4. The economic value per year in Rawapening equal to Rp 2,875 billion. It should be a commitment to the preservation of natural and social responsibility. We need support from residents and visitors to participate a tourism

development program in Rawapening. Last, if the development of Rawapening have been finished, then the local government should raise the price of an entrance fee in Rawapening.

#### REFERENCES

- Barral, N., Stern, M., & Bhattarai, R. (2008). Contingent Valuation of Ecotourism in Annapura Conservation Area, Nepal : Implications for Sustainable Park Finance and Local Development. *Ecological Economics* , 66, 218-227.
- Bowker, J., & Stoll, J. (1988). Use Dichotomous Choice Non Market Methods to Value the Whooping Crane Resources. *American Journal of Agricultural Economics* , 70, 372-381.
- Chong-Ki, L., & W. Mjelde, J. (2007). Valuation of Ecotourism Resources using A Contingent Valuation Method : The Case of the Korean DMZ. *Ecological Economics* , 63, 511-520.
- Development, B. of R . (2009). *Book of Tourism Technical Planning in Rawapening*. Semarang: Government of Semarang Regency.
- Hanemann, M. W. (1994). Valuing the Environment through Contingent Valuation. *Journal of Economic Perspective* , 8 (4), 19-43.
- Hanemann, M. (1984). Welfare Evaluations in Contingent Valuation Experiments with Discrete Responses. *Journal of American Agricultural Economics* , 66 (3), 331-341.
- Java, R. G. (2009). *Tourism Investment Profile in Rawapening*. Semarang: Government of Central Java.
- Tambunan, M. (2002). *Course Material for Graduate Student : The Economic of Natural Resources and Environment* . Jakarta: Faculty of Economics and Business Universitas Indonesia.