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Determinant of Willingness to Pay and Economic Value for Tourism Object using Contingent Valuation Method: The Case of Sangiran Sites, Province of Central Java, Indonesia

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Abstract:

In this paper we want to determine the factors of willingness to pay for quality improvement and to estimates of economic value in Sangiran, Central Java Province, Indonesia. This paper used contingent valuation approach. The study involved Sangiran visitors, they were surveyed for their willingness to pay for historical, cultural, and educational function. Finding from this study, the significant factors affecting the individual's willingness to pay are bid, gender, and income. The economic value of Sangiran sites tourism was estimated between Rp 0.665 billion per year until Rp 2.409 billion per year.

Keywords: willingness to pay; economic value; contingent valuation method; Sangiran sites

JEL Classification: Z3; Z32

Introduction

Sangiran Site is situated about 15 kilometers in the north of Solo town, Central Java, Indonesia. Sangiran is located in Sragen Regency and Karanganyar Regency, Central Java Province, Indonesia. In Sragen, this sites is located in three districts, three districts are District Kalijambe, District Plupuh, and District Gemolong. In Karanganyar, this sites is located in the District Gondangrejo (Hidayat 2015). Sangiran is central for the evolution study of early humans in the world. Sangiran provide information on over 100 ancient human individuals, so this sites reflects human evolution, cultural evolution, and environmental evolution over two million years by means of the cultural materials from their original layers, which show specific periods and environments (Mason 2005, World Heritage Conservation). Sangiran can be categorized as historical, cultural, and environmental heritage. Sangiran also has a role as intangible heritage. Based on the Convention for the Safeguarding of the Intangible Cultural Heritage, it defined that the practices, representations, expressions, as well as knowledge and skills, which is owned by individuals or communities, as a part of the cultural heritage (Hidayat 2015, WHC 2016).

The development of Sangiran often face the dilemma as the construction of other historic sites. The dilemma appeared in assessing the value of historic buildings include the fact that the preservation of historic sites must be involved the public and private sphere, because it has both monetary and non monetary purposes (Mason 2005). Many development of historic sites usually treated as public goods. Ideally, it must be treated as economic goods (Alberini and Kahn 2005, Hoyos and Mariel 2010, Mason 2005). Based on this background, the purpose of this study is to determine the factors of willing to pay and to estimate the economic value in Sangiran.

1. Literature review

Sangiran is one of the largest fossil sites in the world and contains potentially important data for understanding the general process of human evolution. The site of Sangiran represents one of the most remarkable accounts of human fossils in the history of paleo-anthropology. The site bears witness to a defining moment in the development of humankind. This fragile landscape deserves to be given every care and protection for its future survival. The discoveries settled a long-standing scientific debate and attracted a huge amount of attention from scientists. The scientific value of the site is obvious and it should continue answering fundamental questions about past humanity (WHC 2016).

In addition, most fossils have been found accidentally, after soils have been eroded by rain. Most of the cultural or paleo-anthropological materials over the last five years are the result of unintentional findings by locals, digging their land or building houses. A significant number of excavations or archaeological surveys have been undertaken nationally and internationally but the site suffers from a lack of a comprehensive research plan. Important human fossils or archaeological material are potentially to be found in all the layers and all stratigrafical formations, in primary or secondary positions

Sangiran is legitimate that the national and local governments want to take advantage of the two million tourists in Borobudur who arrive at the Airport of Yogyakarta each year, 100 km away from the Sangiran site. The Sangiran site is also 15 km from the Airport of Solo. Two temples and other paleo-anthropological sites are also promoted within the foreseen tourist circuits. The accessibility and proximity of the sites could mean the possibility of visiting three World Heritage sites in three days.

The site is a rich archaeological research area and any impact could affect future opportunities to explain human evolution and the integrity of the area. The number of fossils, the population variation and the grade of evolution, the antiquity of the finds and the potential for further finds necessitate the development of a consistent conservation policy, which is not in place or sufficiently developed in the Management Plan. Any construction within the property could lead to destruction or serious damage due to the fragility of the soils. Competent advice from conservation professionals who have experience in the preservation challenges of similar sites is urgently needed (WHC 2016).

2. Methodology

2.1. Data

The data used in this paper come from visitors in Sangiran. Because this study want get a direct use values, the sample population will be direct Sangiran visitors. So, we must involve Sangiran's visitors. Preliminary survey or pre test was conducted to obtain input and suggestions for the questionnaire. Totally, we distributed 100 questionnaires and only 64 questionnaires can validated. Each questionnaire have five sections, it covering (1) information for Sangiran Sites and research purposes; (2) demographic characteristics of respondents; (3) this section wants to confirm the understanding of respondents to variables forming the utility of the development of tourism in Sangiran. The question consist of motivation, desire, activity of respondents, perception, assessment of historical and cultural value, as well as environmental services; (4) this section consist of a selection of hypothetical scenarios faced by the respondents. On the other words, respondent give a rating for Sangiran development with hypothetical condition; and (5) the last part, it consist of advice and inputs for the development of Sangiran site in the future.

2.2. Contingent valuation approach

Contingent Valuation Method measures non use value of public goods. This method are based on surveyed consumer preferences rather than actual market data. These method uses hypothetical market situation to assess how much the public value of this sites (Carson, Flores and Meade 2001, Mason 2005, Jala and Nandagiri 2015). This technique involves asking people directly what they would willing to pay contingent on some hypothetical change for specific condition. It assumed that some of the beneficial effect such as reduced air pollution, physical improvement from tourism destination, and others, it were public goods and market valuation was not feasible (Binger, Copple and Hoffman 1995, Carson *et al.* 2003). First study used this method, Davis in 1963, his study of recreation in the Maine forests in the north-eastern United States was claimed for academic implementation of contingent valuation method. Then, this method became popular when it used for economic loss that caused by oil spilled in Alaska (Hoyos and Mariel 2010). To construct the question in the form of contingent valuation, we apply the question like this "if the Sangiran Sites will have improved to be better condition. Will you agree if the entrance fee increase amount of Rp Y, - per trip?".

The general approach from CVM, it consider a questionnaire submitted to visitors or recreationist to value a policy which would change the level of some hypothetical change for certain product definition. So, the resource flow being studied must be clearly described to respondents. In this paper, we suppose that the management of the Sangiran sites will improve and will rebuild some part from this sites to be representative and good looking. So, it is proposed that the new policy be paid for by an access charge on all Sangiran visitors. What is the maximum amount would you be willing to pay for this new condition (Hanemann 1984, Bowker and Stoll 1988, Hanemann 1994, Cummings and Taylor 1999, Ramdas and Mohamed 2014). In this paper we work with dichotomous choice contingent valuation method. This method is very popular in CVM analysis because it count non market ecosystem value and non market natural resources value based on willingness to pay from discrete question. Respondent give a question for pay a price if it will happen the improvement of ecosystem or the valuation of environmental services (Alberini and Kahn 2005). Then using an additional entrance fees to Sangiran Sites, it provides a more concrete contingency factors than others commonly used in contingent valuation studies (Jorgensen, Wilson and Heberlein 2001).

In contingent valuation method, this model is built on the assumption that the individual or visitors will maximize utility. Individual utility will be maximum if the individual is willing to accept the offer ticket prices. We can make mathematical equation as follows (Bowker and Stoll 1988, Hakim, Subanti and Tambunan 2011):

$$V(1, Y - A; S) + \varepsilon_1 \geq V(0, Y; S) + \varepsilon_0 \quad (1)$$

Otherwise, individuals who refused the offer ticket prices, it assumes that individuals can not maximize their utility, this condition can be described as

$$V(1, Y - A; S) + \varepsilon_1 \leq V(0, Y; S) + \varepsilon_0 \quad (2)$$

In equation (1) and (2), the notation of V is indirect utility function; Y is individuals income, A is the offer ticket prices, S represents socio-demography characteristics of individuals, and ε_0 ε_1 are stochastic component. Because the utility difference between individuals who agree or not agree with the offer ticket prices defined as follows

$$\Delta\eta = V(1, Y - A; S) - V(0, Y; S) + (\varepsilon_1 - \varepsilon_0) \quad (3)$$

The equation (3) if a format of dichotomous choice from contingent valuation method. In this equation, we have a binary choice as dependent variable so there are two options for estimate this case. The usual procedure used to analyze a binary choice question are logit and probit model. The logit model is appropriate if the error term in the model is distributed according a logistic distribution. If the error term in the model is normally distributed, the probit model can be apllied. Logit dan probit models are estimated using maximum likelihood estimation methods.

In this paper we used logit model. We can write the logistic model when the dependent variable transformed to be probability function as follows (Gujarati 2009):

$$\mathrm{P_i} = \mathrm{E(Y_i = 1|X_i)} = \frac{1}{1+e^{-(\beta_1+\beta_1 X_i)}} \quad (4)$$

Equation (4) can be rewriten as

$$P_i = \frac{1}{1+e^{-Z_i}} = \frac{e^{Z_i}}{1+e^{Z_i}} \quad (5)$$

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

$$1 - P_i = \frac{1}{1+e^{Z_i}} \quad (6)$$

Then,

$$\frac{P_i}{1-P_i} = \frac{1+e^{Z_i}}{1+e^{-Z_i}} = e^{Z_i} \quad (7)$$

If we take natural log for equation (7), we get

$$L_i = ln = \left(\frac{P_i}{1-P_i}\right) = Z_i = \beta_1 + \beta_2 X_i \quad (8)$$

L is log form odds with linear in X and parameters. L called logit then equation (8) are logit model.

2.3 Empirical model & variabels description

From equation (5), the model for this study as follow

$$Y_i^* = \beta_0 + \beta_1 Bid_i + \beta_2 Income_i + \beta_3 Gender_i + \beta_4 Educ_i + \beta_5 Marital + \beta_6 Age_i + u_i \quad (9)$$

From equation (9), there are three common procedure to test this model, (1) individual test, this test compares p value with alpha (α) and this test uses two way hipothesis, (2) overall test, this compares likelihood ratio statistics with chi squared, and (3) godness of fit test, this test uses Pseudo R-Squared. From equation (9), we can show the variables description from this model.

Table 1. Description of variable

Variable	Description
Y	Dependent variable that represent stated willingness to pay, 1 if the respondent willing to pay, 0 if the respondent not willing to pay
Bid	Offer admission to respondent for a given market hypothesis
Income	Income respondent per month
Gender	1 if male, 0 if female
Educ	Time attained for formal education
Marriagestat	1 if married, 0 if other
Age	Age

4. Result discussion

Table 2. Respondents profile in Sangiran

Characteristics	Freq.	Percentage %	Characteristics	Freq.	Percentage %
Sex:			Respondent Origins:		
Male	20	31.25	Sragen Regency	20	31.25
Female	44	68.75	Others	44	68.75
Age:			Monthly Income in Rupiah		
16 – 25	20	31.25	<= 1.5 Million	24	37.50
26 – 35	17	26.56	1.51 – 3.0 million	26	40.62
36 – 45	10	15.63	3.01 - 4.0 million	7	10.94
46 – 55	14	21.88	>= 4.01 million	7	10.94
>55	3	4.69			
Education:					
Junior High School or Less	14	21.88	Marriage Status:		
Senior High School or Less	27	42.19	Married	28	43.75
Diploma	3	4.69	Others	36	56.25
Under Graduate	20	31.25			

As shown in Table 2, the proportion of male respondents (68.75%) is higher than female respondents (31.25%). Respondents with married status only 43.75%, it is smaller than others (56.25%). It's greater than others, represent 56,25% of respondents. Majority of respondents in productive ages, between 16 until 55, it's amount to 95.31%, only 4.69% with age 55 above. From 64 respondents, 42.19% & 21.88% completed senior high school and junior high school or less, 31.25% had bachelor or undergraduate degrees, and 4.69% had diploma degrees.

Based on respondent origins, majority of respondents not came from Sragen Regency (31,25%) than others (68,75%). Charactheristics with monthly income of below 1,5 million rupiah and 1,51 – 3,0 million rupiah accounted for 37,50% and 40,63%. Then, respondents with incomes more than 3,01 and less than 4,0 million rupiah have same proportion for respondents with incomes more than 4,01 million rupiah.

From Table 3, it can be observed that the socio – economic and demographic profile have little influence on stated willingness to pay in this survey. In model 1 and model 2, bid variable was found to have a significantly positive effect on willingness to pay. 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 Sangiran. The significant factor influence the offer ticket price with market hypothesis condition are bid, gender, and income. Another variable is not significant, such as age, marital, and education. This results show that respondent with good budget should be expected to be tighter for smaller respondent so that their willingness to pay might be limited by their ability to pay. The positive sign for income and also significant indicated that there is an income effect for the higher the probability willingness to pay. For bid variable, the positive sign indicated that the higher bid amount, the higher the probability of willingness to pay. Same explanation that the lower bid amount, the lower the probability of willingness to pay. The positive sign for gender variable concern were more likely to be willing to pay.

Table 3. Estimation results

Variable	Model 1			Model 2			Model 3		
	Coef.	Std.Err	Sign.	Coef.	Std.Err	Sign.	Coef.	Std.Err	Sign.
Bid	1.E-04	8.E-05	*	2.E-04	1.E-04	*	1.E-04	9.E-05	
Age							0.066	0.048	
Gender	1.013	0.613	*				-0.780	0.903	
Marriagestat				-0.685	0.725		-1.439	0.978	
Income				2.113	0.641	***	1.897	0.708	***
Education							0.182	0.272	
Constanta	-3.E-01	0.615		-2.799	1.054	***	-4.202	1.567	***
Note: *** = sign. α = 1%; ** = sign. α= 5%; * = sign α= 10%									
Num. Of Obs	64			64			64		
LR chi2	6.400			20.820			23.210		
Prob > Chi2	0.041			0.000			0.001		
Pseudo R2	0.086			0.281			0.313		

Table 4. Economic value in Sangiran (in Rupiah or Rp)

Scenario	WTP (Rp)	Number of Visitors	Total (Rp)
I	2,537	262,310	665,577,160
II	2,759	262,310	723,817,002
III	4,649	262,310	1,219,433,501
IV	4,901	262,310	1,285,676,602
V	9,186	262,310	2,409,629,487

Note: *Total Visitors in Year 2015

The economic value per year in Sangiran equal to Rp 0.665 billion until Rp 2.409 billion. It can be used for management of the Sangiran as a basic reason for improvement to be better. We argued that respondent had quite a good understanding of the public benefits if Sangiran Sites will be improved. Eventhough, a little respondents seemed to have bad experience with the service and the completeness of collection in Sangiran; the god news that these issues can be understanding of a situation by respondents. In another sides, while raising an additional fee lead to potential resistance amongst local hotel entrepreneurs (Laarman and Gregersen 1996, Goodwin, Kent, Parker and Walpole 1997). Even, only small population of hotel owners gain the majority of direct or indirect economic from tourism (Baral and Heinen 2007).

In our findings also suggest that some potential avenues for ensuring high quality visitors experiences in Sangiran. Sangiran visitors experiencing can be main attention because it showed greater willingness to pay higher additional access fees. Then, the most common reason cited for supporting a higher additional fees was to enhance the protection of historical, cultural, and education value in Sangiran. So, the important thing that all stakeholders in Sangiran placed a high importance on control and monitoring measures in order to be assured that the proposed program would actually be implemented as promised and maintained.

Conclusion

From our results, we showed that the paper's contribution to the literature on Sangiran Sites use comes from the estimation individual's willingness to pay for access to Sangiran. This results can also have practical uses. We will try to introduce an additional access fees to Sangiran, which are considered as a public good. Eventhough, if it implemented, it would probably be met resistance from Sangiran visitors because they can reduce for visit to Sangiran. We suggested that an additional access fees around between Rp 2,537 until Rp 9,186. In addition, the value of benefits in Sangiran amounted between Rp 0.665 billion until Rp 2.409 billion. Last, we must support government for Sangiran improvement because it may be profitable from many perspective includes economic, historical, cultural, and education than from recreational one.

Last, we hope that tourism can be an alternative economic sector that is able to contribute significantly to the economic growth of region and the labor market. In addition, tourism can create employment opportunities both directly and indirectly through the provision of goods and services in tourism activities (Zaei 2013, Zulpikar *et al.* 2017).

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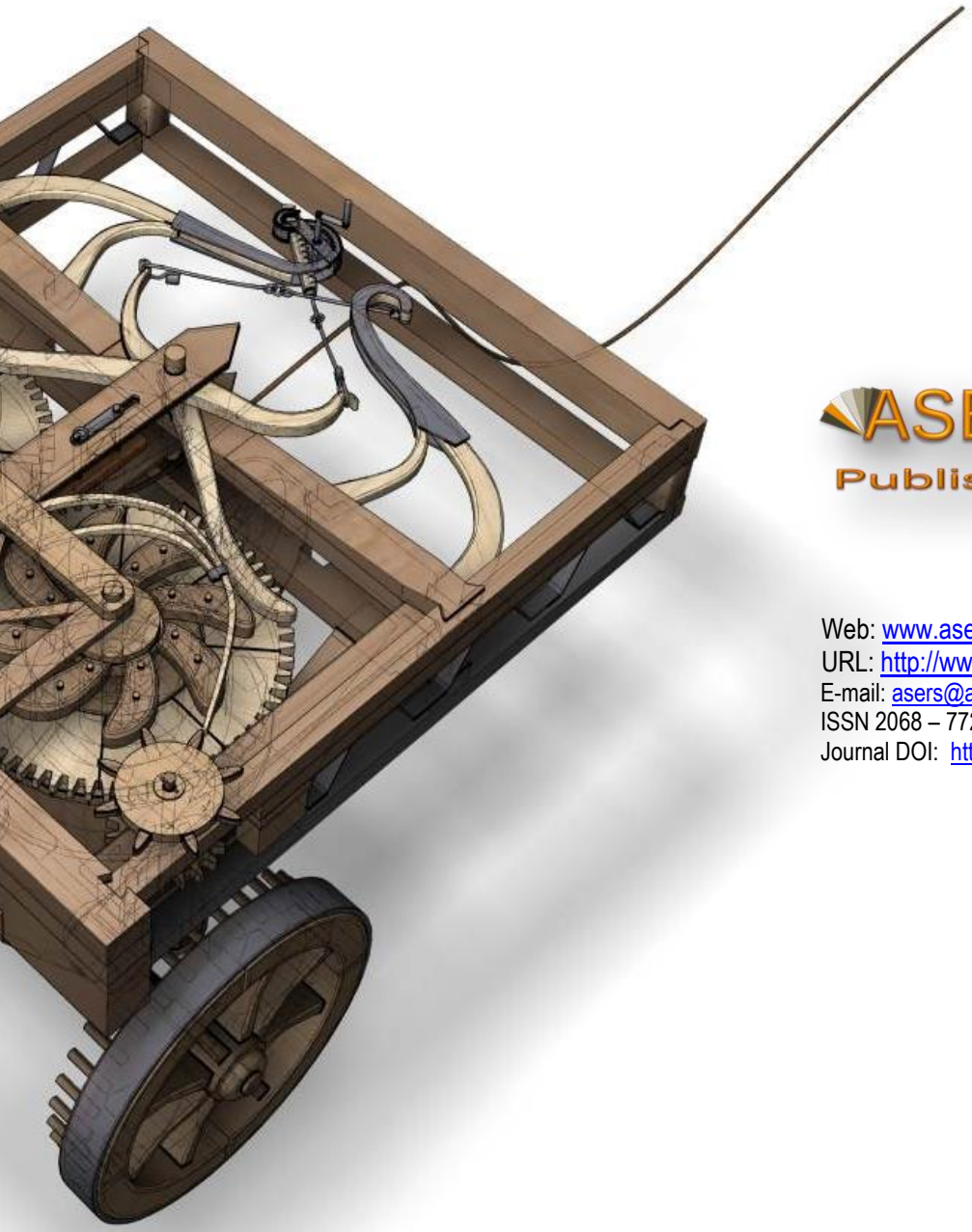

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