

Estimating the Conservation Value of Giant Panda Conservation Centre in Zoo Negara, Malaysia using Contingent Valuation Method

¹Nurshazwani Ab Razak, ^{2,3}Syamsul Herman Mohammad Afandi, ³Ahmad Shuib and ^{2,3}Sridar Ramachandran

¹Postgraduate student at Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

²Faculty of Economics and Management,

Universiti Putra Malaysia, 43400 Serdang, Selangor Darul Ehsan, Malaysia

³Institute of Agricultural and Food Policy Studies, Universiti Putra Malaysia, 43400 Serdang, Selangor Darul Ehsan, Malaysia

Abstract: The Giant Panda Conservation Centre (GPCC), which is the latest edition to Zoo Negara Malaysia, exhibits as an outreach conservational programme. To understand the conservation value of the Giant Panda Programme in Zoo Negara, a study using Contingent Valuation Method (CVM) approach is conducted. The main objective of the study is to estimate the willingness to pay (WTP) of visitor for the Giant Panda programme at Zoo Negara. Data was collected using a structured questionnaire through face-to-face interview sessions at the GPCC. Findings show that the factors influencing WTP are income, repeat visits of visitors and satisfaction index. Mean WTP is estimated at RM20.28, while the conservation value is estimated at RM5,039,235.24 for the year 2014. This study provides valuable information regarding the conservation value of Giant Panda programme in Malaysia.

Key words: Economic value • Zoological Park • Willingness to Pay • Wildlife Conservation Value • Panda loan programme

INTRODUCTION

The Giant Panda (*Ailuropoda melanoleuca*) is an endangered, endemic species in China and a flagship species for conservation. Since the 1950s, it has been considered as top priority for species conservation in China [1]. China started the Giant Panda diplomacy programme to all over the world in the 50's. From 1958 to 1982, China gave 23 Giant Pandas to nine different countries, including Russia, Japan and UK. In 1984, however, Giant Pandas were no longer used purely as agents of diplomacy. Instead, China began to offer Giant Pandas to other nations only on a ten-year loan programme. The Malaysian Giant Panda loan programme witnessed a pair of Giant Panda, Fu Wa and Feng Yi on loan from China for 10 years. The programme called the International Giant Panda Conservation Cooperation Agreement, allows Malaysia the opportunity to conduct research on Giant Panda conservation, in addition to developing and training local expertise.

Research Question and Objectives: The Giant Panda Conservation Centre (GPCC) is a special facility in Zoo Negara, customized for captive breeding of Giant Panda and also as a new recreational exhibit. The sophisticated facilities costing RM24.9 million was created in an area of 1.6 hectares, providing the habitat of Giant Panda in Malaysia for 10 years. In the agreement, Zoo Negara needs to pay an amount of USD 1 million (RM4.46 million) per year to the government of China for the loan programme. Another additional of RM1.5 million per year is also needed for administrative expenses, food and medicine. At the moment, the entrance fee to GPCC is RM20 for adult, on top of existing fee (RM44 for Malaysian adult and RM16 for Malaysian children) to Zoo Negara. The significant establishment and maintenance cost brings the question of what is the conservation value generated from GPCC? Although visitors are required to pay the entrance fee, the amount paid is based on operational cost therefore the price does not depict the satisfaction visitors' obtained from the conservation

Corresponding Author: Syamsul Herman Mohammad Afandi, Department of Economics, Faculty of Economics and Management, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.
Tel: +603-89467258, Fax: +603-89432514.

value of Giant Panda. Instead, an estimated willingness to pay among visitors based on their awareness and conservation would give a better estimation on the conservational value of GPCC. An assessment of economic value of Giant Panda in Malaysia is imperative not only to understand its conservation value but also to justify the money aspect spent by MNRE and Zoo Negara in the Giant Panda Programme. The specific objectives of the study are:

- To determine the willingness to pay for the conservation value of Giant Panda
- To determine the factors influencing willingness to pay for the conservation value of Giant Panda
- To estimate the conservation value of Giant Panda in Zoo Negara

Economic Value of Conservation: The total economic value of an area of land or habitat is therefore clearly far more than the nominal monetary value it would fetch in a normal market situation [14]. It is argued that if monetary values can be placed on these non-market benefits, then there would be a better chance for their true value being reflected in the decision-making process and therefore better decisions being made concerning their optimal level of provision to society.

Contingent Valuation Method (CVM) is an approach developed by economists to value non-marketed public goods and particularly to estimate the value of improvements or damage to environmental amenities [2]. It can be used to estimate both use and non-use values and it is the most widely used method for estimating non-use values. This method involves directly asking individual, in a survey, how much they would be willing to pay for specific environmental services. It is called contingent valuation because people are asked to state their willingness to pay, contingent on a specific hypothetical scenarios and description of the environmental service [3]. The fact that CVM is based on what people say they would do, as opposed to what people are observed to do, it is its greatest strength and its greatest weakness as well [4].

In previous studies, economic valuation can serve at least two useful purposes for conservation. First, valuation can provide information that can directly inform conservation policies, such as payment levels for payments for environmental services (PES) policies, or entrance fees for protected areas [5]. Second and perhaps more important, valuation studies can be used in a general sense to demonstrate that the conservation of nature can result in tangible economic benefits to people. The resulting values can either be directly compared to

other potential uses of land through cost-benefit analysis [6] or can simply serve to raise awareness among policy makers or the general public of the heretofore unrecognized economic benefits of conservation.

There are several previous studies for economic value of conservation in Malaysia. In general, studies of economic value show that visitors are more than willing to pay if they are aware that all their contribution / money will be invested in conservation, improving park facilities and the quality of services [7][8]. The result of CVM studies could be useful in providing relevant information for decision makers and policy purposes in biodiversity and protected area management [9][10].

MATERIALS AND METHODS

The study used a structured questionnaire in face-to-face interviews. The leader of the group was chosen as the respondent by employing a judgment sampling techniques. This is because, most likely, the leader will take charge of the expenditures including entrance fee, has decision making capacity and has own income. Interview sessions were conducted at GPCC, Zoo Negara. A total 250 useable questionnaire were collected.

RESULTS AND DISCUSSION

Demographic Profiles: Approximately half of the respondents are female (50.8%), educated with Bachelor degree (46.8%). Most of the respondents (22.8%) have moderate monthly income between RM2,001 and RM3,000 per month. The mean and median for monthly income is 4126.21 and 3000.00 respectively, whereas the standard deviation is 4350.152.

The Satisfaction Index: Respondents were asked to rate their satisfaction on the items listed in the questionnaire which is from the aspects of *cleanliness, crowding, maintenance area, enjoyment, knowledgeable and condition of environment*. The satisfaction index is then calculated by taking the mean score of satisfaction ranks on individual items. The result shows that satisfaction index score is 3.44 with median score of 3.50 (standard deviation 0.419). This result suggests that visitors are satisfied with the overall condition of GPCC.

Statistical Analysis: Multiple regression analysis is carried out to determine the factors that influence visitor's willingness to pay. The R^2 value (0.175) indicates that the model explains only 17.5% variation of the visitor's

willingness to pay. Among all independent variables, three variables found to be influencing visitors' willingness to pay at 95% confidence level are *repeat visits*, *satisfaction index* and *income*. *Repeat visit* is a dummy variable with positive relationship. It shows that visitors that have intention to visit GPCC again in the future, have higher willingness to pay for GPCC than those without repeat intention. The result also suggests that visitors with higher satisfaction place higher value on willingness to pay. A positive correlation between satisfaction and willingness to pay is also found in previous studies, as visitors believe in proper facilities to support conservation [7, 11]. Many previous studies indicate the importance of income in the determination of willingness to pay. In this study, the income levels is found to be significant at 95% confidence level with directly proportional to the willingness to pay. This suggests that visitors with higher income level have higher willingness to pay, generally because they would have higher disposable income. Positive correlation between income and willingness to pay is also found in many conservation studies [8, 12].

The regression model for this study:

$$WTP = f(HV + OT + REL + REC + STF + TSG + EC + LP + NH + AGP + RF + AP + RV + SI + TD + G + LE + MI + TTC)$$

where;

- HV = How many time visit GPCC
- OT = On site time of respondent in GPCC
- REL = Main purpose to visit GPCC is relaxation
- REC = Main purpose to visit GPCC is recreation
- STF = Main purpose to visit GPCC is spend time with family
- TSG = Main purpose to visit GPCC is to see Giant Panda
- EC = Main purpose to visit GPCC is engaged in class/club/association
- LP = Main purpose to visit GPCC is learning process
- NH = Factor attracting of respondent because nearby house
- AGP = Factor attracting of respondent because attraction of Giant Panda
- RF = Factor attracting of respondent because recommendation from friends
- AP = Factor attracting of respondent because attractive promotion
- RV = Possibility repeating visit by respondent to GPCC

- SI = Satisfaction Index of an individual towards GPCC
- TD = Travelling distance of respondent from their residence to GPCC
- G = Gender of respondent
- LE = Level education of respondent
- MI = Monthly income of respondent
- TTC = Total travel cost had spent by respondent to the GPCC

Table 1: Factors Affecting the WTP using Regression Analysis

Variables	b	Beta	t - value	p-Value
(Constant)	-2.834		-.397	.692
Repeat Visit	5.475	.237	3.715	.000*
Satisfaction Index	5.127	.187	2.956	.003*
Monthly income	.000	.138	2.078	.039*

The calculation of conservation value of GPCC is shown below:

$$\text{Economic value} = WTP \times (VI)$$

where;

WTP = Mean WTP

VI = number of visitor in year 2014

Since the opening in June 2014 until December 2014, GPCC has been receiving a number of 248,483 visitors [13]. The calculation of GPCC conservational value is then obtained by multiplying mean willingness to pay and total visitation to GPCC. This is based on an assumption that one visitor make one visit in that particular period.

$$\text{Economic value: } RM20.28 \times 248,483 = RM5,039,235.24$$

Hence, the conservation value of GPCC for 2014 is estimated that RM5,039,235.24.

DISCUSSION AND CONCLUSION

This study managed to meet the objectives. The estimated value of willingness to pay for the conservation of Giant Panda at GPCC indicates that the GPCC has conservation value. Giant Panda conservation is relatively new to Malaysia. This could contribute to the low estimate (RM 20.28) of willingness to pay. The estimated willingness to pay value is approximately similar to the chargeable entrance fee to GPCC (RM20). Hence, it is suggested that GPCC to maintain the entrance fee price as it is the same amount as visitors' satisfaction.

The estimated conservation value of RM5,039,235.24 from the study is found to be lower than the cost of establishment and maintenance of GPCC. In nutshell, the study found a low estimate of GPCC. At the time this study was conducted, GPCC was only in operations for 6 months. Since the calculation of economic value depends on total visitation, the estimate resulted from this study only represents 6 months period, rather than usual a one-year estimate by most studies.

Since the agreement of Giant Panda is for ten years, a periodical study is suggested to understand a full picture of GPCC benefits. This is significant, especially in annual review of entrance fee. GPCC is also in the effort to implement captivity breeding. Another point to note is the additional cost GPCC would incur for newborn panda should the captivity breeding programme become successful. Whether a newborn Panda might affect the conservation value, another similar valuation study is proposed to understand its effects.

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