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A RECREATIONAL VALUATION OF PUBLIC PREFERENCE ON PARK USERS' WILLINGNESS TO PAY

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ABSTRACT: Public parks provide a numerous benefits and opportunities for community and however, to maintenance of public parks need large amount of local governmental budget. This study investigates park users' preference on willingness to pay to quantify recreational benefit of public parks. A new assessment method was proposed to verify the consistency of data collection by utilizing the relatively simply technique, we called *string method*. Based on this approach, a case study of three public parks in Saga city, Japan was established to qualify users' view that could enable us to evaluate their participation on the improvement of accessibility and attractiveness of park according to community needs. The result indicated that different patterns of recreational travel and activity on park visitation induce in different compensation on public activities' program. This useful information could be utilized to guide local planning agency to locate suitable policy for public park service improvement.

Keywords: Public parks, economic assessment, willingness to pay, string method

INTRODUCTION

In recent years, public parks have played a significant role to balance the urbanization of many cities together with the conservation of green area in the community. While public parks connect to daily lives for individuals and communities to provide a variety recreation opportunity as well as various benefits in terms of aesthetic, ecological and economic benefits, the systematic park planning is required to be harmonized with the community needs for enjoyment of residents, workers and visitors. However, due to the urbanization of many cities that induced an increasing in demand for green areas and amenity spaces in many city centers, the strategic plan on government budget for park management program is necessary to be well adequately designed and effectively allocated for sustainable development. Valuation of recreation benefit has become an essential tool to assess the contribution of recreation opportunities and benefit provided by public parks to users. This study also attempted to establish unconventional approach by propose the useful method to recognize inconsistent data and integrate reliability of the data into the analysis.

Utilizing a simple method that we call string method, binary numbers is assigned on the assessment of park benefit estimation through the contribution for quality of park service improvement. Consequently the consistency of the willingness to pay data could be checked and directly produced the useful finding results. To support the practical application of this methodology, an indirect benefit of park was translated into monetary term by asking users' willingness to pay in the maintenance of park service. Based on this approach, the semi ordinal data was collected on three different public parks in Saga City, Japan to capture the real preference of park users in the community and input in the analysis process.

By integrate public views into the analysis of intangible value of public parks benefit, the results would lead to the understanding of recreational behavior of park users as well as the underlying factors that would became a useful technique in a more proactive manner to hold the promise of effective planning, design and conservation of urban green spaces in the community. Moreover, projecting the multiple benefits of public parks in monetary values provides a universal language and a tangible basis to justify the expenditures, and permits fair competition with other demands for policy and financial support (Lockwood and Tracy, 1995). Therefore, the primary aim of this study is to value the benefits of recreational opportunities and amenities provided by public parks by proposing a new approach to quantify the reliable willingness to pay of maintenance and management program of park service.

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CONCEPTUAL FRAMEWORK AND METHODOLOGY OF STUDY

Public parks provide a variety of benefits and recreation opportunity to the community that cannot directly express based on monetary market values and consequently they are often disregarded or given inappropriate weightings within a traditional cost-benefit decision making process. However, due to significant benefits of green spaces supply to society, the monetary values play an important role to reflect the benefit of public parks in the decision making process that would be made concerning their optimal level of provision to society (White and Lovett, 1999). Various approaches have been employed to identify these non-market values; however, the measurement in terms of willingness to pay through the application of the contingent valuation methods towards maintenance quality of park service was employed in assessing the value of conservation to the public in this study. By utilizing contingent valuation method (CVM) as a means of quantifying public preferences and willingness to pay, a questionnaire approach was used to estimate the economic value of non-market goods such public park services (Scarpa et. al, 2000).

By setting up a question in an underlying assumption is that people are able to translate a wide range of park benefits into a single monetary amount representing the total value (Tyrväinen and Väänänen, 1998). To convey accurate information of the respondents over the interview survey, this study attempted to establish a set of questions to check the reliable of respondents' answers and make consistent with the methodology of the proposed framework of this study in both format and content of questionnaires. Consequently, a sample of individuals were requested to state their hypothetical maximum willingness to pay (WTP) for maintain the quality of park service (Damigos and Kaliampakos, 2003). Then, this study attempt to attain the reliable method to support the contingent valuation, consequently, the survey data could be purified by utilizing string method to verify the consistency of collected data (Ross, 2003).

String Method

String method can be applied by using binary number (0 and 1) for coding willingness to pay data, *w*, the value of each digit in the string s_i =1 for only the case of the respondent is willing to pay an amount of *w*. For the case of not willing to pay, the string will be represented by 0, therefore, the sequence of binary string could be represented by $S = [s_i]$ as given by the following example;

Table 1 The example of willingness to pay data of respondent represented by string method

i	1	2	3	4	Max.
w	0	500	1000	1500	w =1000
s_i	1	1	1	0	(k = 3)

The maximum willingness to pay of respondent in Table 1 is located corresponding to position of maximum index *k*. The discrete willingness to pay, *w* of respondent would be stated to be consistence if and only if the sequence of s_i for the less amount of *w* must be defined by 1 (s_i = 1 for i ≤ k). For any *w*, the total number of string combination to represent any amount of designed *w* depends on the string length of *n* that would generate possible combination of 2^n. However, there would be only *n* possible combination are consistent with maximum amount of *w*. Consequently, the sequence of all zeros is designated to be invalid data and cannot be used for further investigations. This study assumed that the source of inconsistency is ambiguous order of the answer in questionnaire design that respondent might give incorrect answer in the lower level of *w*. This imprecise data can be checked and corrected to improve the reliability of data corresponding to the definition of consistence data as previously stated. This method can provide the approach to make a comparison result between the consistent and inconsistent by calculate the probability function of maximum amount *w* for both cases.

Let f_k and f'_k represent the frequency of total number of consistent and inconsistent *w* of respondents. The summation of both terms is denoted by $\Pi_k = f_k + f'_k$, then to calculate the probability function of *w*, the consistency index, $\alpha_k = \frac{f_k}{\Pi_k}$ is defined to substitute into distribution function, *F*. Therefore, to improve the reliability of data, the consistency index is applied to reduce the effect of frequency that generated from inconsistency data as shown in the following equation:

$$F(k) = f_k + \alpha_k f'_k \tag{1}$$

Finally, the string probability mass function is simply defined as

$$p_k = \frac{F(k)}{\sum_{j=1}^{n} F(k)} \tag{2}$$

Since the measure cumulative probability and the string method survey is based on the samples that represent the entire population that can be related to the willingness to pay data. Therefore, this study attempted to relate the willingness to pay model with this reliable method, the reverse cumulative distribution (*RCDF*) is utilized to convert derived function to be the general logistic curve of non linear willingness to pay model as described by equation (3).

$$P_k' = \sum_{j=k}^{n} p_j \tag{3}$$

Based on this assumption, the theoretical distribution of the RCDF can be calibrated to obtain suitable parameters by using the method as proposed in the next section.

Estimating Willingness to Pay

Base on the questionnaire survey, the explorations of park users on WTP for maintain the quality of park service was done by using logistic regression models. Consequently, the behaviors of park users can be described by the significant factors affecting WTP. The WTP was represented in term of a dichotomous dependent variable with alternative states yes/no as well as the respondent need to state their maximum value of WTP for validate the consistency of answers. This model was also developed by using a consistence data for calibration, and the goodness-of-fit of the models was estimated using the concept of least square method. The logistic model relating the proportion, P_i, of dependent variable to an independent variable x in term of WTP function with the minimum least square error (LSE) is specified as follows:

$$P_i = E\left(Y = 1 \middle| X_j\right) = \left(\frac{1}{1 + e^{-(\beta_0 + \beta_i W(X_j))}}\right) \tag{4}$$

Where P_i is the probability that Y =1, X_j is a set of independent variables explained as in equation (4) and $W(X_j)$ is the function of WTP with the β_i coefficients that was estimated corresponding to logistic distribution. Equation (4) can be represented as a linear regression by taking the natural logarithm, we obtain;

$$L_i = \ln\left[\frac{P_i}{(1 - P_i)}\right] = \beta_0 + \beta_i W(X_j) + e_i \tag{5}$$

Where L_i is called logit or the log of the odd ratios and it is linearly related to both independent variables and parameters. However, the probability function is also represented the willingness to pay function of variable X. It can be seen that $W(X_j)$ correspond to other variables that effect to maximum WTP that can be simply shown as follows:

$$\begin{aligned} W(X_j) &= f(x_1, x_2, x_3, .. x_n) \\ &= \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + .. \beta_n x_n \end{aligned} \tag{6}$$

where $\beta_1 \ldots \beta_n$ and $x_1 \ldots x_n$ are the coefficients and means, respectively, of the remaining independent variable in the model. In this study, a concept of the WTP estimation was assumed to be concerned with users' perception on recreational benefit through their visitation. Based on this assumption, the WTP would be assigned directly to relate with recreational benefit that could be determined from both actual expenditure incurred in getting to consume service and their preference. For actual expenditure, it was rational to integrate the total expense incurred in getting to the site for both travel time and travel cost and the activity time and spending burden on activity at site that would be as a surrogate for the "price" paid by that visitor for that site's use (Douglas and Taylor, 1999). And the preference was quantified from the level of satisfaction that was applied to rate the quality of park service on five different criteria in term of landscape of park, facilities inside park, layout of park, park management and accessibility of park. Together with the quality score of score five levels of 5=excellent, 4=good, 3=fair, 2= very poor and 1=should be improved, thus, single index was calculated to be the representative of overall satisfaction.

These statements would allow for the estimation of preference ratio factor, ρ that would represent the proportional of the actual spending conversion and the WTP data. The derivation of preference ration factor was estimated based on the rational that the actual spending that incurred on recreation enjoyment could be converted to be preference value by divided by level of satisfaction since it was implied that the preference value would be greater if the satisfaction of service is higher as illustrated by equation (7).

$$\frac{\alpha + \beta(TTB_i + TCB_i) + \gamma(ATB_i + ATC_i)}{(SI_i)} = \delta \cdot (WTP_i) \tag{7}$$

where:

TTB_i = Recreational Benefit generated from travel time of park user ith (yen), which is equivalent to λTT_i

TT_i = Travel time to destination of park user ith (hour),

λ = Value of time (yen/hour),

TCB_i = Recreational Benefit generated from travel cost to park of park user ith (yen),

ATB_i = Benefit from perform activity inside park of park user ith (yen), which is equivalent to λAT_i

AT_i = Activity time to perform activity inside park of park user ith (hour),

ATC_i = Recreational Benefit generated from activity cost of park user ith (yen),

WTP_i = Willingness to pay for park maintenance and management of park user ith (yen),

ρ = Preference ratio factor,

SI_i = Satisfaction index on quality of park service of park user ith, which is equivalent to;

$$SI_i = \frac{\sum_{j=1}^{k}\left(\frac{r_j - 1}{R_j - 1}\right)}{k} \quad (8)$$

r_j = Level of satisfaction of criteria for evaluation jth,

R_j = Max level of satisfaction of criteria for evaluation jth,

k = No. of satisfaction criteria for evaluation

This study employed this rational relationship to purpose the unconventional method to identify the relationship between behavior of park utilization by using monetary term based on the travel cost, travel time, activity time and activity cost and users' preference on their WTP. To capture the real preference value of park users, the benefit value that was already given explanation above should be converted to the terminology of participation value based on the relationship of willingness to pay and preference while consume park service that would be then given an explanation. Since the willingness to pay scenarios will mostly be based on individual respondents which emphasize their preference about public park utilization. The questionnaire survey plays an important role to get useful information as an input to the process of economic value identification. As a basis to support this reliable measurement, this study carried out by means of a questionnaire interview survey in the selected study area to retrieve the preference and attitude of park users on the consumption of park service that WTP could be simultaneously derived for further analysis.

The Questionnaire Survey

The proposed methodology was done at the selected study area, Saga city, Japan by focusing on three public parks in Saga city, Japan, that are Saga park, Shinrin park, and Kono park due to the reason the these three parks are well designed as a major representative of different social benefits for users in the community. Both qualitative and quantitative approach has been adopted in this study so that the major concerns of park users' behavior could be captured simultaneously with park users' preference and attitude while they take part in events. The WTP behavior of park users was related to their preference that was not only complicated by different level of appreciation on the different variables that are responded to but it also differ according to a multitude of variables relating to the observer (Ozguner and Kendle, 2004).

An approximately 350 interviewees were random selected through a multiple-choice response format of questionnaire sheets that were provided with specific answers form to clarity the ambiguous answers. The questionnaire survey consists of three sections. The first section was a screening survey which include questions about participation in recreational activity and socio-demographic information; the second section provide information about recreational trips' characteristic to parks; and the third section is about users' preference on park utilization and participation on park improvement program. As carried out on site interview survey, the sample was distributed almost equally in three locations (32.2% Saga castle park, 32.6% Kono park, 32.2% Shinrin park) and day of week (20% weekday, 80% weekend). Finally, a total of 289 effective questionnaires with completed WTP data were applied to investigate the willingness to pay of park users through their behavior and preference data collected from experience on site visitation as shown in Table 2.

Table 2 Different group of willingness to pay data

Category	Willingness to Pay (WTP)		
	Avg WTP	Std. Dev.	Frequency (%)
Activity Characteristics:			
Activity time			
Short (≤ 60 min)	513.16	289.61	38 (19.19%)
Medium (Bet 60-100 min)	550.70	423.13	71 (35.86%)
Long (≥ 100min)	585.73	465.58	89(44.95%)
Type of visits			
Daily visit (No. of visit ≤30)	629.66	373.72	59(29.80%)
Recreation visit (No. of visit >30)	529.35	436.90	139(70.20%)
Travel Characteristics:			
Travel time			
Short (≤10 min)	590.32	409.60	62(31.31%)
Medium (Bet. 10 - 20 min.)	552.90	419.02	69(34.85%)
Long (≥20min.)	537.01	436.76	67(33.84%)
Travel distance			
Short (≤2 km.)	590.32	428.38	62(31.31%)
Medium (Between 2 - 6 km.)	562.32	387.24	69(34.85%)
Long (≥6 km.)	527.31	449.57	67(33.84%)
Average	559.24	420.66	198(100.0%)

Consistency of WTP Data

Prior to perform the analysis of validity and consistency of WTP data, the combinations of string code need to be assigned on each WTP of respondents' answers. The question on WTP was asking park users to select choice of WTP amount for 0, 500, 1000, and 1500 by switching the series of question to check the consistency and asking them to state the maximum amount of WTP. Based on this designed question (n=4), among 32 string sequence of possible combination of discrete WTP, it was found that 68.5% of WTP data was labeled to be valid cases since the other 31.5% was classified to be invalid with all zeros string (0000) that would not be used for further investigations. And after checking consistency of consistent string set that consist of {1000, 1100, 1110, 1111}, the result of analysis indicated that approximately 90% of all valid data was consistency. By applying the methodology of this study, inconsistency data could be corrected to provide the complementary useful data for further analysis. As a result, the string probability mass function could be defined and the parameters in the model were calibrated as represented in Fig 1.

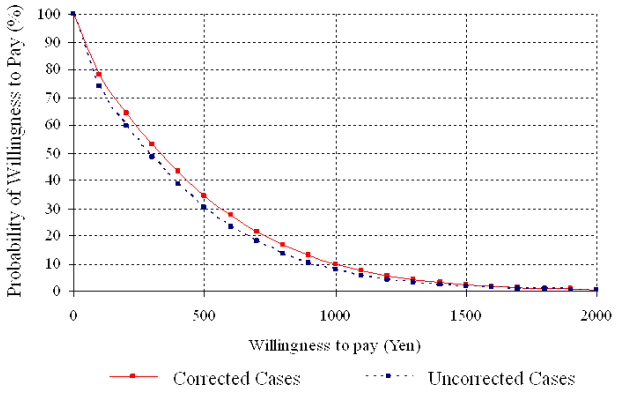

Fig. 1 Probability mass function of WTP for corrected case and uncorrected case

The relationship between maximum willingness to pay with probability function for the corrected case (R square = 0.9601) and uncorrected case (R square = 0.9432) can be also compared as shown by the following equations.

$$P_i corrected = \frac{177.67}{\left(1 + e^{0.0028W(X_i)}\right)} \quad (9)$$

$$P_i uncorrected = \frac{169.129}{\left(1 + e^{0.0031W(X_i)}\right)} \quad (10)$$

From this result, it can be seen that the probability of WTP model for corrected and uncorrected case were in the same functional form but different in the value of parameters. On the other hand, the WTP model in terms of variable X_i was also derived from the calibration of related variables that influence the park users' behavior and preference on the participation in public program.

Willingness to Pay Determination

In order to understand the determinants of respondents' WTP responses, this study attempt to perform a series of multivariate analyses with the survey data that the model could be used to describe the actual behavior and preference of visitors as they purchase public goods and services for making trips to an outdoor recreation site such a case of public parks. Along with this calculation, value of time (yen/hour), λ was assumed to be directly determined from the daily wage rate. Consequently, the value of time, λ for this study is approximately 918 yen per hour. By entering all collected data, the necessary parameters were calibrated by using simple linear regression model. The model represents the high coefficient of determination of R^2 on 0.972. All of explanatory variables are positive statistically significant at 5% level of confidence. The value of estimated parameters can be described as in equation (11).

$$WTP_i = \frac{\left\lfloor 169.925 + 0.740TB_i + 1.008AB_i \right\rfloor}{15.365 \cdot \left(SI_i\right)} \quad (11)$$

TB_i = Recreational Travel Benefit (yen), which is equivalent to $918TT_i + TCB_i$,

AB_i =Recreational Activity Benefit (yen), which is equivalent to $918AT_i + ATC_i$,

By utilizing these parameters estimation, the WTP model would be useful for determine the probability function that represents the demand curve of maximum willingness to pay. Subsequently, the influence of users' behavior that results to different preference on the amount of WTP for park usage at different characteristics could be examined.

DISCUSSION

The representative of WTP that was employed to perform analysis in this study consists of the diversity group of users. Three main categories of data have the variation of WTP that vary corresponding to behavior of park usage for both travel and activity. The analysis of

the WTP data concentrated on the effect of variables of analysis towards the number of respondents that would be useful for the prediction of population corresponding to the specific amount of WTP. Based on the quantification of park users' preference, the major concern would be discussed for two major consideration points. The first point that is the different between probability function of corrected and uncorrected case for consistency measurement and the other one is the effect of several variables that were included in the model obtained from actual park users' behavior.

Comparison between Corrected and Uncorrected Case

The measurement of consistency is the useful tool to increase the quality of data that is very important for the demand analysis. Base on this approach the analysis can reduce the error from questionnaire survey and the error comparison between corrected and uncorrected case from this analysis can be graphically demonstrated in Fig 2.

It can be seen that without the reliability approach the percentage of higher amount of WTP have more possibility to be incorrect estimated. In addition, the calculations of probability of respondent on specify amount of WTP in non linear term refers to the importance of the public parks influence to the users. This can be a useful technique to assist public agencies in tourism planning to prioritize the budget based on benefit value compared to other kind of public facilities.

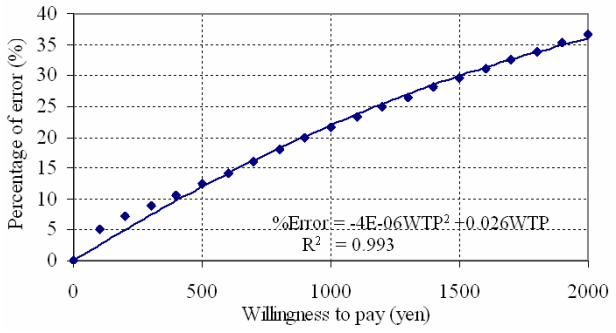

Fig. 2 Percentage of error prediction between corrected and uncorrected of WTP measurement

The Effect of Variables in the WTP Model

From the nonlinear relationship of the demand function with the WTP model, it can be seen that the effect of actual spending for both activity and travel is directly related to the WTP while the preference factor and the satisfaction has inverse relationship. Within this relationship, all variable had the positive sign related to the WTP and to translate the time to do activity and travel to be in monetary term and the effect of income also had the positive sign for its coefficient value as expected. Base on this model, the result could be implied that without any expenditure and regardless with satisfaction on service, park users would like to contribute their money to maintain the quality of park service. Moreover, the relationship also indicated that the effect on expense in activity has more effect on the amount of WTP than expenditure incurred in getting to park site. It means that with the same time and spending for recreational travel to park, users who do activity with high amount of expense and stay longer for activity in park would contribute more money for public improvement program.

The finding could direct to the useful application by consider the sensitivity on the explanatory variable effect to the model. As a result, the analysis was performed to illustrate the significant of each category of variable effect to the number of respondent on a state amount of WTP and the classification of analysis consist of behavior characteristics and users' preference as illustrated in Table 3. For travel characteristics, there are two related attributes that explain the behavior to visit park site in term of travel time and travel cost. On the other hand, the park users' behavior was also explained by the characteristic of activity that users perform at park in term of duration to perform activity, and money spending for activity.

Table 3 The impact on WTP by increasing/decreasing in percentage change of variables

Category of Analysis	Travel Characteristics		Activity Characteristics		Preference
	Travel Time	Travel Cost	Activity Time	Activity cost	SI
Average Value	21.27 (Min.)	108.23 (Yen)	101.22 (Min.)	257.37 (Yen)	0.71
Elasticity, $\Delta Y/\Delta X$	-2.54	-0.85	-16.45	-2.74	28.08

From Table 3, it can be seen that the both park users' behavior on travel and activity result to the negative sign of elasticity but preference of park users has the opposite sign. It means that 1 percent increasing in the value of attribute behavior will decrease the number of respondent in the specify amount of willingness to pay. It is noticeably seen that the time to getting to the park has more effect to the WTP about triple of the cost incurred during the trip. The same trend was also expected on the attributes of activity characteristics, the users who has activity time longer would influence to the reduction in the percentage of number of respondents on

the specify amount of WTP about 6 times of activity expense.

It can be implied that in the same willingness to pay amount and same satisfaction index score, users who travel in longer time and higher expenditure for both traveling and perform activity would compensate their money less on the willingness to contribute to the society that could be graphically demonstrated by Fig 3 and Fig 4, respectively.

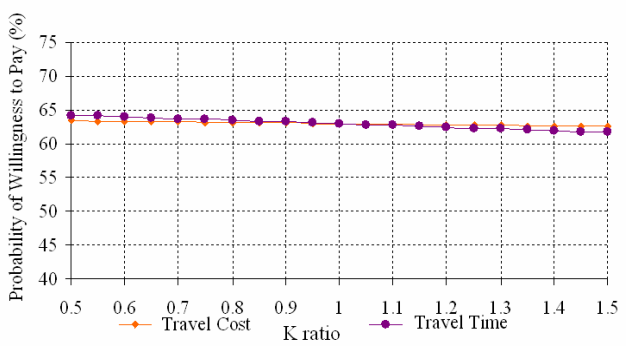

Fig. 3 Percentage of reducing and increasing in travel cost and travel time

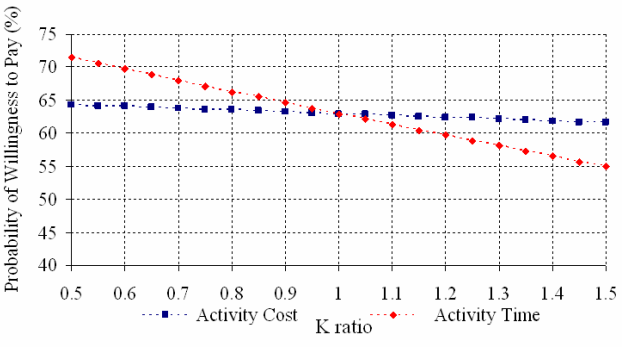

Fig. 4 Percentage of reducing and increasing in activity cost and activity time

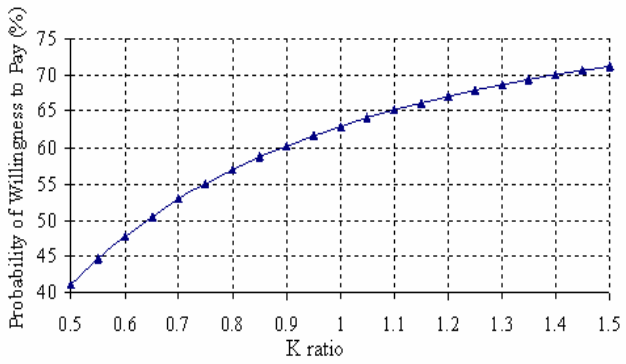

Fig 5 Sensitivity analysis for public park service improvement on quality of service

On the opposite way, concerning park users' preference for quality of park service improvement, satisfaction of service was represented by satisfaction index. The result of analysis confirms that the enhancing the quality of service in 1 percentage increase in satisfaction would result to the more willing to pay to maintain the quality of service as depicted by Fig 5.

The comparison of the influence of this preference attribute to the other attributes on behaviors, it could be implied that the preference have more effect to the WTP than behavior. From this relationship, it can be seen that maintain the quality of park service in the good condition can not be longer ignore to since it is relatively sensitive to the preference of users.

Based on this graphically interpretation (Fig 3 and Fig 4), the Y axis represents the ideal demand and the X axis represents the variation in the condition of factor corresponding to WTP. The average value of X is at X_0 and the value of Y would be obtained after substitute X into the function. The sensitivity analysis represents the change in park policy from existing situation, X_0 to X_1, so that the demand would be changed from Y_0 to Y_1. Based on this idea, the original demand is at X_0 with zero value of ΔX would be varied to draw the relationship of this changed. The change of X would then be compared with X_0 in the horizontal axis, so that the ratio of this variation contrasts with the original value is correspond to *K-ratio*.

From all result of application, it was already in agreement with the hypothesis that diversity and variation of pattern of park usage result to various preference of park users in term of WTP. Therefore, the reliable method to qualify the data collection plays a vital role in achieve of this useful result of analysis. By apply the qualify data to this unconventional methodology, the alternative approach in delineating the total spending on recreational benefit related to preference on public participation on quality of park improvement program can be drawn a useful conclusion. It can be used to reflect the role of park users' behavior along with users' preference to estimation of willingness to pay of park base on users' view that to fulfill the need of the target group of this kind of public service.

CONCLUSION AND FUTURE STUDY

This study attempted to establish the unconventional method to verify the consistency of the process of recreational benefit estimation. Therefore, the well-known method of WTP estimation as an application of contingent valuation approach was adopted to identify the public park benefit from the park users' perception that was the main stakeholder to provide this service. To stimulate public awareness of potential amenity benefit

from park service, Saga city in Japan was selected as a study area to support the useful of the methodology of this study. The use of this reliable approach, string method to deal with survey data from questionnaire survey aims to qualify the public opinion data by using a sequence of binary code. Consequently, the monetary valuation from park benefit can be estimated from the stated amount of WTP for maintain the quality of park service.

Furthermore, the calculation of error generated from without applied this method verified that this useful method could reduce the error that might be generated especially at the higher amount of WTP. After perform the verification of consistency of data, the integration of all valuable qualitative and quantitative through the untraditional method was analyzed through WTP estimation based on the behavior approach and the preference of users on the evaluation of public service. For behavior approach, the characteristic to reach the recreational site was focusing on the attribute of expense and time, furthermore incorporated with the same elements of activity characteristic, the preference ratio factor was calibrated to convert the behavior factor to preference value. Along with users' preference, the satisfaction index was calculated from the combination of various satisfaction normalization score from the assumption that the higher level of satisfaction results to the higher value of preference on participation of public service in term of WTP, the WTP model was estimated by considering the relationship between behavior and preference of park users.

The probability of WTP model revealed the non linear relationship between the amount of WTP and number of respondents. This logical result demonstrated that most of park users prefer to contribute their money in the lower amount of WTP. Furthermore, the application of this result provides the useful information that preference of park users influence on WTP than the behavior side. This implication was obtain from the relationship that the more expenditure and time spending to visit park and do activity would contribute less amount of WTP. This behavior was implied that this group of users was recreational users rather than daily users since the latter group would have their residential within the proximity area to park that they can have more accessible to reach park and they can visit more often. Therefore, the consideration should be given to not only improve the quality of park service but also increase the number of daily users. Since the users' who have more appreciation to consume the service and have potential to visit park habitually would participate on public concern than others. This might be from the reason that they feel high satisfaction and ownership to this kind of public space that would induce to the more responsible for public work.

However, this useful framework is still probably not sufficient as a way of quantified indications of the value placed by society since the understanding of users' experiences on their recreational behavior was relatively complicated. Moreover, the interview survey on site might interrupt the immediate recreational time of users while they enjoy the amenity and surrounding, consequently the answers might not represent their genuine behavior and perception.

Nevertheless, these results provide the potential idea to preserve the nature beauty, enhance the quality of park service, promote the enjoyment of this kind of public service and have regard to the social and economic well being of the local community, including the needs of the environment. However, several extensions of the current study should be further explored alternative approaches to combining willingness to pay and behavior data. Efforts in this direction will provide additional evidence of the validity of the indirect recreational valuation method and retrieve the more useful result on behavior study. Since the more comprehensive data is necessary for the application of this approach to obtain more reasonable and reliable results.

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