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INTERACTION BETWEEN RECREATION ACTIVITY AND PUBLIC PREFERENCE: A CASE STUDY ON PUBLIC PARKS IN SAGA CITY, JAPAN

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ABSTRACT: Public parks are one of the representatives of urban environment that play an essential role to daily life of people and provide a variety of benefits and opportunities for community as green spaces. The lack of understanding of associations between pattern of park utilization and users' preference has made difficulties to highlight the role of public parks in community while reflecting social needs of park users. To reflect actual preference of park users, Saga city in Japan was selected as a case study by employ an unconventional method to capture the real preference from actual target group of public park service. An indirect value of park users' benefits estimation has been done through the determination of *preference value factor*, *PVF* in different users' socioeconomic and recreation activity characteristics. The uniqueness of this method is to focus on the linkages between the availability of public parks and social preferences. On the basis of findings, the results pointed out that not only different satisfaction on park service induce on the differentiation of PVF value but the different willingness to pay on maintenance and management park service also result to demonstrates an different intuitive appreciation for environmental valuation based on park visitors' preference.

Keywords: Public parks, park users' behavior, park users' preference, preference value factor

INTRODUCTION

The development of cities to be urbanized has influenced on both social and environmental aspect in addition to the growth of urban populations and the associated industrialization has resulted in a range of detrimental and often dehumanizing outcomes (Woolley, 2003). The quality of urban environment is associated to a wide range of elements of daily life including housing, education, health, crime, employment and leisure, both for individuals and communities or populations as a whole. These development, therefore, have lead to the need of green space that has important amenity values contributing to the quality of urban life. One of the representatives of public green spaces as an integral component of the urban landscape is public park. Public park was seen as providing a setting in which communal sharing of experiences could take place promoting social harmony. It also provides a variety of benefits and opportunities for community (e.g., environment, economic, educational). Furthermore, public parks have long been an image of recreation area that confers a range of physical and mental health benefits to the users and residents in proximity area. However, it has frequently proved problematic despite their intrinsic contribution to the public realm since a combination of changing social and demographic structures, public safety concerns, the rise of new leisure opportunities, and shortages in funding for maintenance or improvements to facilities in urban parks has induced many small parks to become unattractive to local users (Freestone and Nichols, 2004). Additionally, not only different types of public parks can present their own peculiar mix of constraints and opportunities, but the diversity of users' characteristics, preferences and attitudes also lead to differences in perception on park service.

The lack of understanding of associations between pattern of park utilization and users' preference has made difficulties to highlight the role of public parks in the community while reflecting the social needs of the park users. It is in this regard that this study has been developed to investigate the preference of park users focusing on amenity values of public parks to users by measure the actual spending and the willingness to pay for public parks' maintenance and management. Moreover, the findings would indicate that more than half of the park users were willing to pay for maintenance improvement of public park service in the community. To reflect the actual preference of park

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users, Saga city in Japan was selected as a case study. An unconventional method was employed to capture the real preference from actual target group of public park service by using the recreational valuation method compared users' satisfaction and their willingness to pay.

An indirect value of estimation of park users' benefits has been done through an evaluation of difference of recreation expenses based on individual and group preference approach. It corresponds to the integration of travel expenditure incurred in getting to the site and the difference expense on recreation activity at parks. Subsequently, the data were collected on three different public parks in Saga City, Japan to support the methodology of real benefit that users obtain from consume public facility based on rational choice approach. In order to capture the real preference of park users in the community, the recreation demand in parks was utilized through this study to determine the *preference value factor*, *PVF* in different users' socioeconomic and recreation activity characteristics. The *PVF* is the factor derived from the comparison between recreational benefit and preference value while users enjoy their recreation time at park. In addition, the assessment from this determination revealed how park users compensate their recreation time corresponding to their preference while visiting park. Based on this approach, it enables us to put forward a number of basic principles and to highlight the dominant functions of public parks from a users' point of view such that it would become a valuation technique for public parks.

This paper has two main objectives. First, it intends to examine the recreation benefit towards total spending on traveling and recreation activity in contrast to the preference value on park service through the case study of public parks in Saga City, Japan. The second objective aims to show the significance of different users' socioeconomic and parks characteristics on diverse perception of quality of public park service that would result to different PVF value. The uniqueness of this method is that it focuses on the linkages between the availability of public parks and social preferences. On the basis of findings, the result of analysis indicated that group of transportation means play a major role to differentiate the *preference valuation factor, PVF*. Since the different group of users on different modal usage compensate their recreation time with a different expense regarding to travel characteristics. An indirect value of estimation park users' benefits has been done corresponds to the integration of travel expenditure incurred in getting to the site and the expense on recreation activity at parks. This approach can be a useful technique to assist public agencies in planning multiple uses of public lands and prioritize the budget based on benefit value compared to other kind of public facilities.

The structure of this paper is organized as follows. First of all, the employed method for investigate the pattern of public park utilization and park users' behavior is presented and the relevant literature is reviewed in the next section. Method to determine the preference value factor is presented based on behavior and preference of park users. Before concluding remarks, the result of analysis on users' socio-demographical characteristics, recreational activity and location characteristics together with their recreation preferences and perceptions were given detail. Finally, the conclusion of this study is summarized and discussed for future research.

CONCEPTUAL FRAMEWORK AND RESEARCH HYPOTHESES

This research deals with the recreation activity, users' preference and satisfaction, as well as the relationships between them. The principal theories that explain such concepts are elaborated, because they constitute the theoretical basis for the model. Specifically, a literature review of the appraisal theories of recreational benefit derived by visitors to parks and other recreational sites (Chen et al., 2004; Liston-Heyes and Heyes, 1999), and literature in favour of an approach to retrieve public attitude and satisfaction (Syme et al., 2001). Given the diversity of preference and attitude on park service, this study attempted to perform an indirect technique for estimating user benefits from visits to recreational sites such public parks.

Values and Benefits of Public Parks

By applying travel cost method, the expenditure related to recreation travel would be treated as travel costs and as such an, considered as an accounting aggregation of out of pocket costs associated with distance traveled and value of time spent traveling (Englin and Shonkwiler, 1995). This expenditure incurred in getting to the site would be as a surrogate for the "price" paid by that visitor for that site's use. This allows for the estimation of all benefits that occur on recreation sites and activities. Despite the various practical and theoretical problems in this method, this technique could describe the actual behavior of reservationists as they purchase public goods and services for the purpose of making trips to an outdoor recreation site such a case of public parks (Douglas and Taylor, 1999).

It was understood that the different characteristics of this kind of public space affect different individual's patterns of activities, the modes and frequencies of utilization (Iamtrakul et al., 2004). Consequently, the individual perceived the value of public parks in different way due to their personal characteristics, such as age, income, education and past experience of using public park service and the different attractiveness and accessibility of park also resulted to the different value of park benefits from different patterns of public park utilization. This study intends to quantify the preference valuation factor, *PVF* from the reason that there should be some relationship between the total spending on the consumption of recreational service and park users' preference with willingness to pay. Non-travel cost expenses, demographic and socio-economic variables, and site quality variables are held at the sample means in this estimation by this scientific way to interrelate human-nature relationships.

Perception and Preference of Public Parks

Evaluation of the recreational service by users' experience plays an important role to reflect the actual value of service that might result to differentiate from users' expectation (Bigne et al., 2004). The service that performance exceeding expectations can cause pleasure in the same time the short of performance expectations can cause displeasure. The visitor's perception on recreational sites and services influences through satisfaction index that is a quantifiable approach. The enhancing visitors' pleasure or the more satisfaction on park service was assumed to be related to the willingness to pay for parks planning and management activity. Therefore, it is necessary to launch an approach to ascertain index to reflect the indiscernible relationship between the value of perceived performance in term of willingness to pay and total spending for recreational trip and activity.

However, there is a need to distinguish different behavioral dimensions on recreational activity with effecting to diversity preference and attitude of park users. In addition, it is difficult to understand preference of park users since there are different variables responded to the appreciation of service that also differ according to a multitude of variables relating to the observers, including age, gender, social characteristics, cultural background, past experience, motives, and the daily routine and specific interests of the individual (Ozguner and Kendle, 2004).

Our study attempts to establish the unconventional preference index for park service by integrate all park users' preferences and attitudes. Regardless of preference difference, the interaction between both total spending on recreation activity along with travel and willingness to pay from park users can be examined. Although there is an increasing body of research on urban environment from different perspectives concluding that environment has beneficial effects on human beings, however, considerably less research has been carried out into users' attitudes, specifically in regard to different function of recreational place. Therefore, this study also aims to verify the suitability of the proposed framework through a case study of public parks in variety locations. More specifically the study tries to investigate the relationship between behavior and preference to public parks in the community.

METHODOLOGY

Research Approach and Sampling Frame

As a basis for the methodological approach, the present study is carried out by means of an empirical study in the area of recreational travel and activity behavior for a case study of public parks. This study relates the leisure activity and travel behavior to recreational sites from users by organizing the data collection at destination site to draw the relationship on the existing condition of proximity and connectivity of route to park effect to users. Following that, the applied study of visitor experience was also included in the research methodology. Thus, a qualitative and quantitative approach has been adopted for interview survey. Specifically, personal interviews were conducted inside parks during the experience of the service itself that is to stimulus the evoke visitor emotions by using questionnaires for gathering information on consumption public service.

Based on this approach, the major concerns of park utilization that are park users' behavior, recreational travel characteristics, preference and attitude on their visitation can be integrated for analysis and can provide useful results for the policy suggestion. This valuable approach will not only capture the real behavior of park users in the community but also reflect the value of preference and attitude of target group of parks users. According to the objective of this study, to examine the interaction between preference and recreational behavior of park users, consequently, Saga city in Japan is selected as a case study. In order to investigate the preference value factor, *PVF* that influence on behavior and attitude on activity and site selection for recreational. To present research results on this study, the recreational type of public parks need to be selected. Therefore, three

different functions of public parks in Saga city are picked up as places for study the park users' behavior. Subsequently, the conceptual framework of this study is illustrated in Fig. 1.

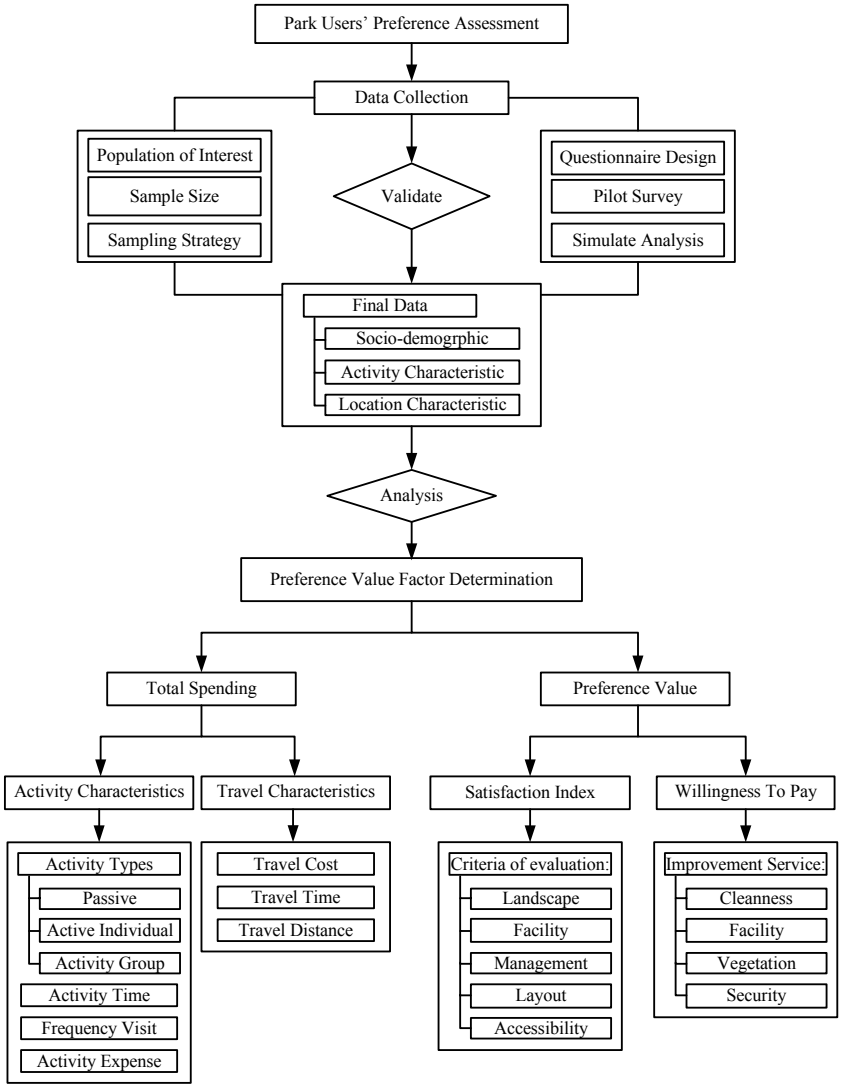

Fig.1 Conceptual Framework of Study

Sampling of Respondents

The data with for this study are obtained from interview survey at three different sites of public parks in Saga City as the representatives of public parks in this city as depicted in Fig. 2. The survey used random sampling interview park visitors while they enjoyed leisure time on recreation activity at park during spring of 2004. The description of each park is explained in Table 1. The selection of the three public parks based on different benefits and opportunities that public parks provide for the community. Interviews took place on site at three different public parks and lasted between 15-20 minutes. As well as the survey was done by asking participants to response three set of questions that are activity characteristic, site attractiveness characteristics and personal socio-demographic information. Furthermore, with the objective of getting up close to the stimuli that triggered the park users' experience, the characteristic of site also include the preference and attitude of park users while they enjoy recreational service on site. An interviewer was stationed inside the park and approximately 350 interviewees were random selected. As carried out, a total of 289 useful questionnaires were obtained from on-site interview survey at three different public parks. The sample was distributed as shown in Table 2.

Study Area

Saga Prefecture is located in the northwestern part of Kyushu. It is surrounded by Fukuoka Prefecture to the east, Nagasaki Prefecture to the west, the Genkai Sea to the north, and the Ariake Sea to the south. Saga covers

an area of about 2,400 square kilometers, and the population is equal to 886,000 people.

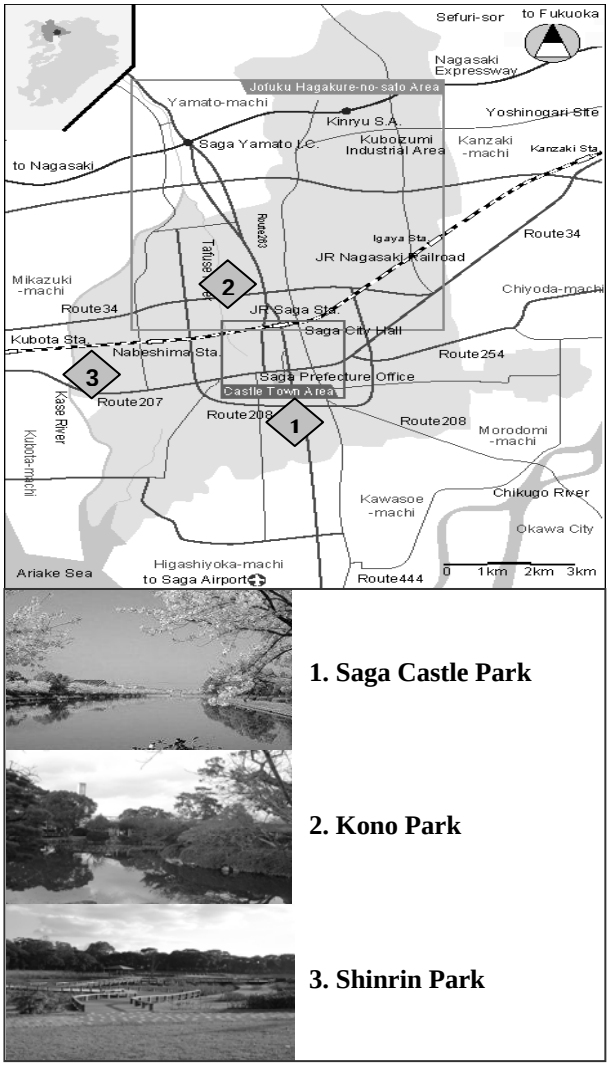

Fig. 2 Three different functions of public parks: a case study of Saga city, Japan

Table 1 Description of three selected public parks: a case study of Saga city, Japan

Name of Public Park	Size (ha)	Location average distance from home (m.)	Facilities
1. Saga Castle Park	24.40	1600	1. Library 2. Museum 3. Gymnasium 4. Picnic Area 5. Playground
2. Kono Park	5.40	400	1. Amusement Park 2. Zoo 3. Picnic Area 4. Playground
3. Shinrin Park	37.30	1600	1. Gymnasium 2. Picnic Area 3. Playground 4. Play Field

The social benefits that users can perceive are the opportunity for users to acquire the service and perform activities or take part in events. Therefore, not only the location of park influence the different social benefit to park users but the different main facilities inside parks also play an important role on different opportunities for users to consume different kind of services as shown in Table1. As a result, three different location of parks are chosen, one location was located at the out skirt of city limit that is Shinrin park. Another two parks within the central city were Saga castle park and Kono park. A multiple-choice response format of questionnaire sheets were provided with specific answers form that was simple designed to clarity the ambiguous answers.

Table 2 Distribution of samples classified by park location and day of visit

Park Location		Day of visit		Total
		Week day	Weekend	
Shinrin Park	Count	43	53	96
	% within Park name	44.8%	55.2%	100.0%
	% within Day of visit	38.1%	30.1%	33.2%
	% of Total	14.9%	18.3%	33.2%
Saga Castle Park	Count	19	77	96
	% within Park name	19.8%	80.2%	100.0%
	% within Day of visit	16.8%	43.8%	33.2%
	% of Total	6.6%	26.6%	33.2%
Kono Park	Count	51	46	97
	% within Park name	52.6%	47.4%	100.0%
	% within Day of visit	45.1%	26.1%	33.6%
	% of Total	17.6%	15.9%	33.6%
Total	Count	113	176	289
	% within Park name	39.1%	60.9%	100.0%
	% within Day of visit	100.0%	100.0%	100.0%
	% of Total	39.1%	60.9%	100.0%

The summarization of overall data on category of socio-demographic, recreational travel and activity characteristics are represented by Table 3.

Table 3 Summary of park users' socio-demographic, recreational travel and activity characteristics

Variables	Park Visitors (n=289)	
	Mean	Std. Dev.
Demographic		
Age (year)	33.74	14.96
Household size	2.89	1.54
Income (yen)	146,885.81	146,394.13
Activity Characteristic		
Activity time (min)	102.88	81.52
Activity expense (yen)	287.72	620.07
No. accompany person	3.29	3.82
No. visit in year	23.86	20.02
Trip Characteristic		
Travel time (min)	21.41	18.52
Travel distance (km.)	7.59	12.14
Travel cost (yen)	109.07	220.78

However, after data filtration for only valid case of willingness to pay for analysis, the useful data was equal to 198 questionnaire set. Together with this classification related to the perception experience in park visits, multiple items from designed question were utilized to construct the proposed conceptual model (recreational benefits, park service satisfaction, and preference valuation).

CONCEPT OF PREFERENCE VALUE FACTOR DETERMINATION

Most of the study has applied the travel cost method for estimating recreational benefit, however, the expense for benefit generate for recreational consumption is not only generated from travel part. Therefore, this study extend the travel cost method by applying this idea to include the other expenses by assumed that the value of park benefit reflects through park users' behavior can be considered in term of the different of total expenditure. The expenditure incurred in recreation visit from total expenses and time spend for both traveling and perform activity at park compared with not visit the site, as shown in equation (1).

$$TB = \Delta TS \tag{1}$$

where:

TB = Total benefit obtained from recreational activity and traveling to park (yen)

ΔTS = Different expenditure between visit and not visit park (yen)

Therefore, it is assumed that the benefit incurred to obtain the recreational service from park visit equate to the different of time and cost of both travel and activity and both cost and time of non-visit are assumed to be zero, it would be finally equivalent to the total expenditure spend for park visit, *TS*. By integration of the travel expense together with other expenses, the total expenditure at site visitation can be determined to be further applied for estimation of preference value factor, *PVF*. Before proceed to the process of calculation, it is necessary to assume that users decide on one site selection rather than multiple sites to visit on any one trip. By this assumption, it can allow us to identify value of both incur travel costs for the actual trip to park and the actual cost incur on actual activity carry out at park. Consequently, the total spending can be represented by the following equation;

$$TS = \alpha + \beta B^{TB} + \gamma B^{AB} \tag{2}$$

where:

TS = Total spending from recreational activity and traveling to park (yen)

B^{TB} = Spending from traveling to park (yen)

B^{AB} = Spending from perform activity in park (yen)

The parameters α, β and γ are given to cover up the possible inconsistency values for both benefit generate from traveling and perform activity inside. Because the benefit incur from traveling to the park itself has contained the opportunity cost of travel time additional assumption is needed to include the value of on-site time that is same as value of travel time. Therefore, the valuation of recreation benefit by considering only from traveling to destination as a case of public parks can be calculated as the following equation.

$$B^{TB} = B^{TT} + B^{TC} \tag{3}$$

where:

B^{TT} = Spending in term of travel time value (yen)

B^{TC} = Spending in term of travel cost (yen)

The value of time in this study, λ, *is* a representative of unit time value that will be used for both travel time and activity time valuation. By substitution value of time to determine benefit from spending time for travel to park, the separation of travel time benefit from travel cost can be demonstrated as in equation (4).

$$B^{TT} = \lambda T^{TT} \tag{4}$$

where:

λ = Value of time (yen/hour)

T^{TT} = Travel time to park (hr)

Then, the activity side need to be identified by valuation of the activity in term of activity time and activity cost. The monetary term based on activity value was given explanation as the following equation;

$$B^{AB} = B^{AT} + B^{AC} \tag{5}$$

where:

B^{AT} = Spending in term of activity time value (yen)

B^{AC} = Spending in term of activity cost (yen)

On the other hand, the same value of time, λ was applied to be a representative of unit time value for recreation activity inside parks. Consequently, the value of time was substituted to calculate the activity time value, the separation of activity time benefit from activity cost can be then demonstrated as in equation (6).

$$B^{AT} = \lambda T^{AT} \quad (6)$$

where:

T^{AT}= Activity time inside park (hr)

All explanation on the above derivation on total expenditure are then substituted to equation (2), the monetary term of recreation benefit from spending based on travel and activity for a case of public parks in general term can be obtained.

$$TS = \alpha + \beta(\lambda T^{TT} + B^{TC}) + \gamma(\lambda T^{AT} + B^{AC}) \quad (7)$$

On the other hand, ideally by using rational decision, users who spend longer time to travel and higher expenditure should tend to spend more time and cost in their activity inside parks. They should be willing to pay more fees for maintenance quality of park service. Nevertheless, it is not always the case that some users do not always have their rational choice. This study employed this rational relationship for the purpose of utilizing 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. 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.

Let the total money spending on participation in maintenance service and public activity is valued by *TP*. The participation was assumed to value higher as if users satisfy or prefer service at the time that they consume the service. The higher satisfaction means the higher value that would be reflect to the higher participation value and it was also denoted by

$$TP = W^{P} \cdot SAT \quad (8)$$

where

TP = Participation value in park maintenance and management (yen)

W^P = Willingness to pay for park maintenance and management (yen)

SAT = Satisfaction index on quality of park service

On the other hand, the level of satisfaction on park service can be derived from different perceptual qualities of the sites. Consequently, to obtain the perception index, the average score of satisfaction need to be determine as a representative of the integration of the normalized value as shown by the following:

$$SAT = \frac{\sum_{x=i}^{n}\left(\frac{r_i - 1}{R_i - 1}\right)}{n} \quad (9)$$

where

r_i = Level of satisfaction i

R_i= Max level of satisfaction i

n = No. of satisfaction criteria

However, there should be some interaction between the total spending on recreational travel and activity for a case of public parks and the participation value on public works for maintenance and management program. Therefore, this study attempted to determine the preference value factor, ρ from this interaction. Thus ρ is described to represent the multiplication factor of relationship between total spending on travel and activity and participation value, this relationship can be written as follows:

$$TS = \rho TP \quad (10)$$

By applying this relationship and combining this idea with the idea of total benefit from travel and activity benefit, the preference value factor, ρ can then be determined as follows:

$$\alpha + \beta\left(\lambda T^{TT} + B^{TC}\right) + \gamma\left(\lambda T^{AT} + B^{AC}\right) = \rho\left(W^{P} \cdot SAT\right) \quad (11)$$

$$\rho = \frac{\alpha + \beta\left(\lambda T^{TT} + B^{TC}\right) + \gamma\left(\lambda T^{AT} + B^{AC}\right)}{W^{P} \cdot \frac{\sum_{x=i}^{n}\left(\frac{r_i - 1}{R_i - 1}\right)}{n}} \quad (12)$$

However, the real data is required to calibrate with the numerical values of equation (12) from the actual data collection at different public parks in Saga city. It is necessary to calibrate the model in order to obtain parameters for further application. Subsequently, the useful parameter can be employed to verify the usefulness of this integrated approach with traditional travel cost method.

Out of 198 effective questionnaires were applied to investigate the relationship between preference value and benefits that users experience from a site visits, the parameters in equation (7) need to be calibrated by using data on travel time, travel cost, activity time and activity cost spend at park. Along with this calculation, value of time (yen/hour), λ was assumed to be directly determined from the daily wage rate. This socioeconomic value was obtained from users' income divided by total working hour per month that was assumed to be 160 hour per month. So that, the value of

time, λ for this study is approximately equal to 918 yen per hour and the satisfaction index was derived from different level of satisfaction on five different criteria to evaluate quality of public park service and their attributes.

The criteria consist of satisfaction on landscape of park, facilities inside park, layout of park, park management and accessibility of park. The quality score were employed to rate the park quality in terms of score five levels of 5=excellent, 4=good, 3=fair, 2= very poor and 1=should be improved. Along with the willingness to pay for participate in maintenance and management program to improve quality of park service, all useful data are summarized based on park users' characteristics and recreation characteristics as shown in Table 4 and Table 5, respectively. It can be seen that not only different group of users' characteristic and socioeconomic result to different preference to participate on public works, but also the recreation characteristic also result to a diversity value of willingness to pay.

Table 4 Summarization of willingness to pay classified by park users' characteristics

Variables	Mean	Std.Dev.
Gender		
Male	573.15	458.46
Female	547.17	386.67
Age (year)		
Young (≤30)	520.29	454.43
Old (>30)	603.23	376.54
Monthly Income (yen)		
Low income (≤200,000)	493.58	401.04
High income (>200,000)	660.26	432.55
Occupation		
Civil servant	722.22	363.24
Business person	555.56	316.67
Private employee	766.67	522.44
Laborer	656.90	410.08
Housewife	512.50	380.94
Student	483.15	435.99
Retired/Non-working	523.81	314.49
Others	523.64	475.02
Total	559.24	420.66

RESULTS OF ANALYSIS

By entering all collected data, the necessary parameters of equation (12) were calibrated by using simple linear regression model. The model represents the high coefficient of determination of R^2 on 0.972. All of the explanatory variables are positive and statistically significant at 5% level of confidence. The values of estimated coefficients are given as in Table 6.

Table 5 Summarization of willingness to pay classified by recreation characteristics

Variables	Mean	Std.Dev.
Activity time		
Short (≤ 60 min)	513.16	289.61
Medium (Between 60 min and 100 min)	550.70	423.13
Long (≥ 100min)	585.73	465.58
Type of visits		
Daily visit (No. of visit ≤30)	629.66	373.72
Recreation visit (No. of visit >30)	529.35	436.90
Type of activities		
Single activity		
Passive Activity	628.57	405.68
Active Individual Activity	511.00	405.37
Active Group Activity	488.79	407.28
Multiple activity		
Passive Activity + Active Individual Activity	1050.00	737.11
Passive Activity+ Active Group Activity	506.82	322.30
Active Individual Activity + Active Group Activity	515.38	512.91
All Activity	707.69	411.22
Travel time		
Short (≤10 min)	590.32	409.60
Medium (Between 10 min. and 20 min.)	552.90	419.02
Long (≥20min.)	537.01	436.76
Travel distance		
Short (≤1.65 km.)	590.32	428.38
Medium (Between 1.65 km. and 5.8 km.)	562.32	387.24
Long (≥5.8 km.)	527.31	449.57
Total	559.24	420.66

Table 6 Result of model calibration on travel and activity benefits

Explanatory Variable	Unstandardized Coefficients		t-Statistic	Sig.
	Parameter	Std. Error		
Constant, α	169.925	27.461	6.188	0.000
Travel benefits (yen), β	0.740	.033	22.258	0.000
Activity benefits (yen), γ	1.008	.011	95.299	0.000

By utilizing these parameters estimation, the preference value factor, ρ can be determined from the relationship of behavior and preference determination. The assignment of monetary value also demonstrates an intuitive appreciation for environmental valuation based on park visitors' preference. This result showed a useful issue that plays a significant role in generating valuable economic information for local government policymakers to place suitable management plans in maintaining quality of public park service in association with the preference of the park users to achieve the goal of public service.

Subsequently, the more detail on park visitation behavior and perceptual qualities of the sites can be assessed. The influence of preference value factor for park usage on different point of analysis was examined. Data were analyzed using categorical data by submit to chi-square analysis with preference value factor as the dependent variable. This provides an omnibus test that indicates whether the distribution of responses differs significantly for different groups. Analysis of the data concentrated on the differences between the categories of analysis towards the preference value factors that influence by users' pattern of park utilization. Key issues are the different users' perceptual on park service result to the different pattern of park usage that include both personal users' characteristic and attractiveness of sites. Therefore, the items of interest in this study are classified into two main group of analysis. The first one is socio-demographic characteristics and the second one is the sites' influence factor that is recreational activity and location characteristics.

Socio-Demographic Characteristics

The statistical of χ^2- test was used to analyze the collected data and determine the significant differences at a 0.05 significance level of park users' socio-demographic characteristics. The users' profile that has similar characteristics in terms of demographic is classified into the same group. Consequently, the analysis was made to compare different results and confirmed that different groups of demographic characteristics differ between the respondent groups. And therefore differences found in subsequent analysis are shown in Table 7. There are four different socio-demographic of park users' characteristic that are considered in this study that are gender, age, income and occupation.

Gender and Age Groups

For the gender variable, it can be seen that male respondents (n = 92, 46.5%) value their trip more than preference value to participate on park maintenance and management activity approximately 2 times greater than female (20.6:10.8). This might be from the reason that for the same amount of contribution to society in term of WTP, male would spend money for travel and for activity at park more than female do.

However, if the expenditure on money and time incur for park visits are same amount, female tend to compensate for society than male park users. When considering age of visitors, the younger users (n = 105, 53.1%) were likely to value their trip and activity inside park more than preference to improve the quality of park service. Since the proportion of total spending for their recreation at park compare to their spending for public with their participation preference is much more than old people. It can be clearly seen by considering the preference value factor of young group is almost double of elderly.

Table 7 Preference value factor on park users' socio-demographic characteristic

Variables	PVF	Frequency	Std. Dev.
Gender			
Male	20.64	92	44.02
Female	10.78	106	17.67
Age (year)			
Young (≤30)	20.66	105	41.92
Old (>30)	9.38	93	16.45
Monthly Income (yen)			
Low income (≤200,000)	20.01	120	41.06
High income (>200,000)	8.21	78	9.33
Occupation			
Civil servant	5.33	9	4.25
Business person	8.26	9	8.94
Private employee	5.86	18	5.08
Laborer	11.96	29	15.48
Housewife	13.27	28	26.21
Student	19.19	73	23.47
Retired/Non-working	6.38	21	5.59
Others	50.97	11	112.70

Income and Occupation Groups

Most of low income people (n = 120, 60.6%) has greater preference value factor than high income group about 2.5 times. It might be from the reason that high income users have potential to compensate their total spending for their recreation trip and activity as well as in the same time for contribute to public participation much more than low income users. As far as the occupation is concerned, about 36 % of respondents are student that has the highest preference value factor. This result can be implied that this group of park users value their actual cost and time spending for recreation at park more than their participation on park service improvement. Since this group of users are considered to be young group of park users that they might not much realized to be concerned with contribution to society as people who concern with public works. On the other hand, for the group of civil servant (n = 9, 4.6%), as expected that for the park users who work for public government office or agency, they would appreciate their trip and activity at park not so much different than their preference to participate on public works for park quality improvement compare to other careers

Recreation Activity and Location Characteristics

The 0.05 level of confidence was used as the critical value in determining the statistical significance of all results. As shown in Table 8 and Table 9, the preference value factor was analyzed based on characteristics of activity and location of park, respectively. Interviewers were asked for the activity and related attributes that users perform at park as well as the travel behavior to visit park site. For activity characteristics, three attributes that are considered in this study are duration to perform activity, type of visits and type of activity. On the other hand, for park location characteristics, this study draws the representative variable from park users' behavior on travel characteristics that are travel time and travel distance.

Recreation Activity Characteristics

For duration of visit as illustrated in Table 7, it can be seen that the longer time to stay inside park to do recreational activity, park users tend to spend more expenditure, so that the preference value factor for users who spend shorter time is greater than visitors who stay in long duration. Users who spend time for activity longer than hour (≥1 hr.) (n = 89, 45.0%), have preference value factor about 5 times greater than short time visitor (≤1 hr.) (n = 38, 19.19%). Another important variable that is frequency of visit was converted to classify park users to be two groups. These groups consist of daily visitors and recreation visit by calculated from number of park visitation per year. It can be seen that for users who seldom visit park (n = 139, 70.2%) has preference value factor about twice greater than users who go to park almost everyday. This might be from the reason that user who frequently visit park have more preference on participation to improve quality of park service, however, the recreation visitor might spend more total expense on their visits as well. Therefore, it is necessary to investigate further for the activity that users do at park.

For the category of activity, there are three main different activity that are passive activity, active individual activity and active group activity. Passive activity (n = 63, 34.4%) relates to activity that are performed for providing relaxation and recreation or enhancing socializing to performer such as meeting friends, looking after children or view, reading, photography, conversation with stranger, resting, etc. The active individual activity (n = 10, 5.5%) and active group activity (n = 58, 31.7%) are the activities that involve in a range of sporting activity include both indoor and out door activity that perform individually and in groups.

By comparing among single activity type, active individual activity occupies the greatest value on preference value factor, following by active group activity and passive activity, respectively. It reflects the fact that for passive activity users, they value their recreational trip and activity not so much different from the participation to public works. In the opposite way, for users who come to jogging or running, they might just spend money for some drink by not considering much about their preference value for quality of park improvement. The other group that is multiple activities represents the combination of activities that users perform at park. It can be seen that when users perform all activity at one time visit, they would appreciate their recreation by value their cost and time spending for travel and do activity not so much different from contribute to public works.

Table 8 Preference value factor on park activity characteristic

Variables	PVF	Frequency	Std. Dev.
Activity time			
Short (≤ 60 min)	4.69	38	7.46
Medium (Between 60 min and 100 min)	9.60	71	12.18
Long (≥ 100min)	24.52	89	46.14
Type of visits			
Daily visit (No. of visit ≤30)	8.21	59	10.70
Recreation visit (No. of visit >30)	18.40	139	38.35
Type of activities			
Single activity			
Passive Activity	9.05	63	19.18
Active Individual Activity	48.78	10	119.18
Active Group Activity	16.18	58	19.38
Multiple activity			
Passive Activity + Active Individual Activity	9.35	4	10.49
Passive Activity+ Active Group Activity	12.56	22	14.99
Active Individual Activity + Active Group Activity	17.40	13	17.20
All Activity	5.97	13	5.46

Recreation travel Characteristics

The travel behavior of park users plays an important role on recreation location characteristic of park since the location of park effects on accessibility and consequently results to the different expenditure on cost and time to park users. Among different modes, users travel to park by three various modes that are walking, cycling, and passenger car. Most visitors (n = 142, 49.1%) visit park by an expensive mode, passenger car and follow by cycling (n = 86, 29.8%) and, walking (n = 61, 21.1%). Therefore, the travel time and cost correspond to variety of modal usage are employed to analysis for different preference value factor. Then, the respondents are classified to into three different travel time and travel distance to represent the recreational location characteristics. These classifications are short, medium and long for both travel cost and time.

From Table 9, it is noticeably seen that park users who spend longer time for travel to park would have higher preference value factor. As expected, the group of users who has travel time longer than 20 minutes (n = 67, 33.8%) would have preference value factor about triple of short time (n = 62, 31.3%) and twice for medium travel time (between 10-20 min.). It can be implied that in the same willingness to pay amount and same satisfaction index score, users who travel in longer time value their trip greater when they travel in longer distance.

Table 9 Preference value factor on park location characteristic

Variables	PVF	Frequency	Std. Dev.
Travel time			
Short (≤10 min)	8.63	62	13.35
Medium (Between 10 min. and 20 min.)	12.88	69	20.84
Long (≥20min.)	24.15	67	50.02
Travel distance			
Short (≤1.65 km.)	8.36	62	13.36
Medium (Between 1.65 km. and 5.8 km.)	14.47	69	22.83
Long (≥5.8 km.)	22.77	67	49.36

For the case of travel distance as depicted in Table 9, the result of analysis shows the same trend as the travel time. Since there is an interaction between travel distance to reach the site and time consuming for traveling as well as it is reasonably for general case that the greater travel distance would take longer travel time. The result indicated that users who travel in distance longer than about 6 km. (n = 67, 33.8%), they would have preference value factor about 2.7 times greater than short travel distance (n = 62, 31.3%) and about 1.6 times for medium travel distance (n = 69, 34.9%).

APPLICATION OF STUDY AND DISCUSSION

Park users' characteristics are very important variables explaining recreation activity. Personal characteristics, combined with those of activity and location characteristics from pattern of park utilization provide a very useful result for recreation activity responses from users' point of view. Knowledge about these characteristics is essential to focus on the totality of park users and their inherent needs. It was found that that preference value factor represent the relationship between recreation valuation for a case of park and the preference on public participation for quality of park service improvement.

For park users' characteristics, it can be seen that the main variable that influence on diversity of preference on park utilization consists of gender, age, monthly income and occupation. Perhaps it may be explained by the fact on how different group of users value their park service consumption and preference value on public relations. Among all personal characteristics of park users, the very interesting is that there is a big different between the preference value factor.

Park Users' Characteristics

In the comparison case of gender, it is obviously seen that male value their recreational trip and activity much more than willingness to compensate for improving the existing situation of park service than female do. The result for age case is also pointed out the same fashion. Old people concern more with participation on public involvement than young group. However, the very rational finding resulted on the income variable that high income users tend to have more responsibility to the society and public facility that they concern than lower income groups. As expected that the occupation of users also lead to different preference on park utilization. Since the result designated that for users who are public workers would show their accountability on public participation to contribute on value public service greater than other group of users.

The sensitivity analysis was performed by considering park users' characteristics to demonstrate the change in preference value factor when apply this conceptual of study to other study area that have different distribution of socioeconomic. The representative of park users' socioeconomic characteristics, income was selected to perform analysis and the result can be viewed as shown in Fig. 3. This kind of socioeconomic play a very important role in park planning since the possible changes in income influence on value of time result to the rate of preference value factor. The relationship revealed that there is directly relationship between users income and preference value

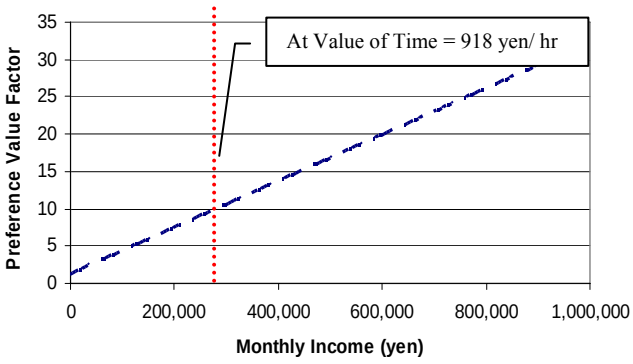

Fig.3 Sensitivity analysis for preference value factor vs income

factor. The higher income would lead to the more *PVF*.

Recreation Activity and Location Characteristics

It is also presumed that the recreational activity and location characteristics also play vital role in examining the interaction between valuation of personal expense and society contribution. Since not only the duration visits, type of visit and type of activity result to different attitude on pattern of park usage. But the travel characteristic is also clearly demonstrated the useful result. For users who visit park in longer duration would value their visit higher than short duration. And it was evidently confirmed by the frequent of visit that the more frequent of visit would try to participate and willing to improve quality of park service. This might come from the reason that they have more ownership attitude to park than the recreation visit group. Consequently, the different type of activity that users perform at park also results on different preference on this kind of public service. Visitors having more activity perform at park would value their preference higher than single activity compare to their total expense.

The finding could direct to the useful application by consider the sensitivity on the actual spending on recreation travel and recreation activity. The analysis as shown in Fig. 4 indicated that the benefit from activity has value of slope more than travel benefit. It means that when the same amount of cost and time spend for enjoy recreation at park, the preference value factor would influence by benefit from activity more than travel. It might be from the fact that most of park users would like to enjoy their recreation time at site more than traveling to park.

Concerning park users' preference for quality of park service improvement, there is an explicit preference for mixed types of activity and strong variation in pattern of

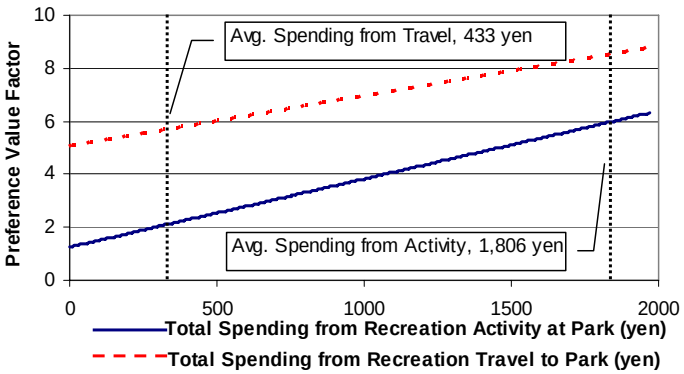

Fig. 4 Sensitivity analysis for preference value factor vs recreation travel and activity

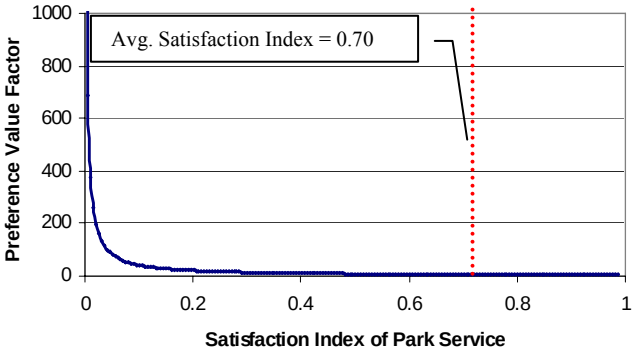

Fig. 5 Sensitivity analysis for preference value Factor vs satisfaction of park service

park utilization. Therefore, it can not be longer ignore to maintain the quality of park service in the good condition although the level of satisfaction is not much sensitive to the preference value factor as shown in Fig. 5.

From all result of application, it was already in agreement with the hypothesis that diversity and variation of users characteristics and pattern of park usage result to various preference value factor. Therefore, the useful data collected play a vital role in achieving these useful results of the analysis.

By applying 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 personal characteristic of park users along with activity and location recreational characteristic on estimation of benefit of park in monetary term compared to preference value of public service.

CONCLUSION AND FURTHER STUDY

In this study the recreation use of park in Saga city, Japan by means of questionnaire survey was investigated. The classification of park's visit can be approached throughout preferences of users, as well by activity and location characteristics. The useful collected data also include perception, preference and attitude of users on park service. The integration of all valuable qualitative and quantitative through the untraditional method was accomplished to value the recreational service based on the total spending approach and value the preference on participation public service. For total spending approach, the traditional travel cost method is employed and incorporated with the other expense on activity at park to

capture the overall spending that are generated. Along with the preference valuation, the level of satisfaction index was calculated from the combination of various satisfaction normalization score from the assumption that the higher level of satisfaction result to the higher value of preference on public participation derived from willingness to pay. Consequently, the valuation of public preference in term of *preference value factor, PVF* was quantified by considering the relationship between the actual total expense for park recreation and the interaction of level of park satisfaction service index and willingness to pay for park quality of service improvement.

The useful results reflected that fact that for many groups of users' characteristic, and pattern of park visits, the more consideration should be compensated or provide more alternative and/or complement to group of users who has high preference value factor. Since they value benefit from recreation in a very high rate compare to their preference, on the other hand they might not appreciate the existing condition of service at that time. It might be due to the reason that many other aspects of park as a public space contribute to their negative experience, including psychological connections with nature, physical topography and geography, a sense of one's body and physical capabilities, and the proximity between the park and several, different communities. Therefore, they value their preference to public service is much lower then actual expenditure on cost and time to visit park. It means that they hesitate to participate on public concern that might be from the reason that they feel low ownership to this kind of public space and have no responsible for public work..

This result showed a useful issue that plays a significant role in generating valuable tool for local government policymakers to place suitable management plans in maintaining quality of public park service in association with the preference of the community. By using this park users' preference assessment, the *preference value factor* can be a useful technique to assist public agencies in planning multiple uses of public parks. However, this useful framework is still probably not sufficient as a way of fully understanding experiences of recreation activity for a case of public parks. Nevertheless, several extensions of the current study should be further studied to retrieve the more useful result on park users' behavior. Since the more comprehensive data is necessary for the application of this approach to obtain more reasonable and reliable results. Along with the finding result from this study, the existing available information is difficult to launch more clarify result to reach effectiveness policy. In addition, GIS also need to be applied since this tool has potential to deal with geographical data and spatial analysis. The integration of these schemes can provide fruitful insights about users' travel behavior on different park location selection for their recreational time and to launch more specifically plan according to the requirement of users.

REFERENCES

Bigne, J., E. Andreu, L. and Gnoth, J. (2004). The Theme Park Experience: An Analysis of Pleasure Arousal and Satisfaction. Tourism Management, In Press.

Chen, W., Hong, H., Liu, Y. Zhang L., Hou, X. and Raymond M. (2004). Recreation Demand and Economic Value: An Application of Travel Cost Method for Xiamen Island. China Economic Review, 15:398-406.

Douglas, A., J. and Taylor, J., G. (1999). A New Model for the Travel Cost Method: The Total Expenses Approach. Environmental Modelling & Software, 14, 81-92.

Englin, J. and Shonwkiler, J.S. (1995). Modeling Recreation Demand in the Presence of Unobservable Travel Costs: Toward a Travel Price Model. Journal of Environmental Economics and Management, 29: 368-377.

Freestone, R. and Nichols, D. (2004). Realising New Leisure Opportunities for Old Urban Parks: The Internal Reserve in Australia. Landscape and Urban Planning, 68: 109-120.

Iamtrakul, P., Teknomo, K., and Hokao, K. (2004). Accessibility and Attractiveness for Public Park Utilization: A Case Study of Saga, Japan. Proceeding of the International Symposium on Lowland Technology (ISLT 2004):319-324.

Liston-Heyes, C. and Heyes, A. (1999). Recreational Benefits from the Dartmoor National Park. Journal of Environmental Management, 55: 69-80.

Ozguner, H. and Kendle, A., D. (2004). Public Attitudes Towards Naturalistic Versus Designed Landscapes in the City of Sheffiled (UK). Landscape and Urban Planning, In Press.

Syme, G., J., Fenton, D., M. and Coakes, S. (2001). Lot Size, Garden Satisfaction and Local Park and Wetland Visitation. Landscape and Urban Planning, 56: 161-170.

Wooley H. (2003). Urban Open Spaces. Spon Press, London, UK.