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Valuing Visitor's Willingness to Pay to Generate Revenues for Managing Putrajaya Botanical Garden

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ABSTRACT

Policymakers and recreation site managers use changes in fee structure, either introducing park entrance fees or increasing existing ones, to generate revenues, improve services, and reduce damages associated with visitor's overuse. The sudden increase in park usage fee, however, can make the park inaccessible to certain segments of visitors. Understanding park users' response to changes in fees and its implication on park use equity is, thus, important to achieving a park's full potential in a socially and environmentally responsible way. This information is crucial especially for developing countries, where the issue has received relatively less attention and underfunded. This paper contributes to the literature on park access fees by empirically assessing park use equity between and among international and local visitors visiting Putrajaya Botanical Garden, Malaysia and developing an approach for determining predictors and mean willingness to pay values for park entrance. Results of our survey-based approach show a positive willingness to pay values for park entrance and fee increases. Our results also show that it is possible to raise revenue without exacerbating existing park use differences.

1. Introduction

In recent decades, communities in major cities continue to grow at an accelerated pace. Thus, demand for a much better living quality, education, wages, housing, public transportation and health care have experienced rapid increasing of the request due to the Asia-Pacific urbanization and increasing of populations [37]. As a country developed, most of the dwellers from the rural areas start to migrate to the bigger cities, and this is causing more concentrated surrounding. The maintenance of the urban forest contributes to improve the quality of life of the people. The community today especially gives the importance of establishing a balance between economic growth and environmental quality and social well-being. This implies that urban forests are needed to enhance the environment, increase community attractiveness and livability, and foster civic

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pride [36]. In this respect, the social projects that are aimed at preserving and enriching the existing urban forest are of growing importance.

One of the best measures in preserving and enriching biodiversity is through the designation of a protected urban forest. But, as a result of rapid urbanization and the public needs, the established urban forests are considered less attractive and therefore exists the willingness to pay for a better facility. A well-funded and appropriate organized management will be able to promise that such healthy environments are secured. Conservation and preservation of environmental resources are essential for both human and wildlife, and it requires effective management. It is the responsibility of managers and authority to have good and balance management objectives that will not only please the needs and preferences of visitors, but to be able to benefit the local community, as well as to sustain the biodiversity conservation.

Virtually, there is no urban forest park in Malaysia that charge entrance fees and only some of the national parks are charging for entry, and it did not even generate enough income to cover all its cost [3]. A differentiated fee system is available in most of the parks that practice entrance fees, where foreigners would have to pay more than the local visitors. Furthermore, several extra fees must be paid in some of the parks in order for tourism activities to take place such as; vehicle fee, camera and filming fee, boat and camping fee as well as fees for other extra attraction such as a themed pavilion. Yet, the entrance fees are comparatively low compared to the conservation costs.

Introducing an entrance fee or increasing existing fees on nature-based tourist sites offer several managerial and economic benefits. By regulating access, fees can reduce congestion, littering, trampling, disturbance and exploitation of wildlife, and sought after attributes of protected areas [7]. Such fees can also supplement public budget allocated for the operation, maintenance, improvement of park facilities, and enforcement of relevant regulations [24]. It can also help recover the cost associated with establishing and managing parks, as well as compensate for the opportunity costs associated with preserving and protecting sites. Modifications to the fee structure can also help avoid loss of revenue, prevent underproduction of park services, address the relatively high overhead cost associated with charging no fee or too low a fee [39,43]. This is valuable especially when there are competing needs, including development projects, for limited funds available to decision makers and park managers [1].

Determining the number of money users are willing to pay for enjoying a park's amenities also allows us to more accurately estimate the monetary value associated with the park and its services, internalize environmental benefits, and provide a more complete picture of a country's natural capital [21]. Furthermore, such analysis generates information that can be used in the economic appraisal of policies and projects designed for the park [31]. By decentralizing funding sources, such measures can also improve management efficiency [7]. However, higher fees can reduce the frequency of their visit, the number of the parks' paid recreational services they participate in, and impact the likelihood of future visits to the park [27]. As such, higher fees can reduce societal welfare [27].

In this paper, we assess park use differences between local and international visitors and among local visitors of varying income and education levels through a survey designed to explore these questions using Putrajaya Botanical Garden as the selected study site. Specifically, we assess the factors that predict users' willingness to pay for entrance fees and increased fees on currently paid services.

2. Literature Review

Urban forest nowadays had turned to more artistic, pleasing, and emotionally satisfying place in which to live, work, and spend leisure time [13,38]. Shading trees and other landscape plants help rejuvenate soils at landfills and other contaminated sites by reducing the number of soil pollutant [42], while the widespread tree covering was assessed to decrease possible soil runoff by 7% [32]. According to Nowak and Dwyer [27], physical environment aspects of life such as air, water, social and environmental surrounding had been influencing and effected on dwellers' quality of life and their satisfaction. An urban forest is relatively important in the urban area. The urban forest is a connection between urban area and nature. However, Zhou and Parves Rana [45] claimed that it is not easy to come to a clear conclusion about the effectiveness of existing arrangement for protecting urban forest without much more information especially regarding monetary value. They highlighted that information regarding the monetary value is very important to prove that the urban forest is really important. By knowing how much visitors' value the recreational service of the areas, the managerial team will be able to determine the monetary value of the existing park. Given other potential uses of protected areas, such valuation is also useful in justifying the investment that goes into protected areas [31].

Despite differences in the type of facility, the method used in estimating their value, relevant geography and time, entrance fees to outdoor recreations have long been in use [18]. The approaches used in determining such fees depends on whether one is valuing a use or non-use value, which are further disaggregated into direct, indirect, option, existence, and bequeath values [15]. Whether the data used is elicited from stated responses or it is based on observed behavioral so affects how such valuations are done [29]. Contingent valuation, which is a versatile approach and has been used successfully in various settings, determines the value of a given good or service by directly eliciting individuals' response contingent upon specified conditions. It has its roots in welfare and environmental economics, which use utility and consumer surplus theories to determine how much value individuals attach to non-traded goods and services. Education level, income, travel motivation, gender, nationality and other attributes are then used to explain variations in stated values among respondents [9,10]. Whereas using cheap talk scripts and reminding respondent to consider their budget can help address the hypothetical bias, using multiple bid values as potential controls can help address the strategic bias, which is a couple of methodological concerns that surround this valuation approach [29,15].

Whereas this approach provides a reasonable framework for determining entrance and park use fees, imposing such fees is not without conflicting views. The public good view on park use fee asserts that since parks are part of the national treasure their management cost should be covered through general taxes instead of being collected from users as fees [26]. On the other hand, the user-pays view asserts that those who use the park should pay for the use. Considering that some individuals use parks more than others and that some users, such as international visitors, do not even pay tax to that country, this view further asserts why one should not rely solely on public funds. Other areas of conflict between these two views include practicality, the likelihood for double taxation, and the relative importance of use and non-use values in constituting the total economic value associated with parks [4,31].

Given the likelihood that some park users may react negatively to such fees, it is important to assess whether visitors consider such fees as being fair beforehand. This is important in making informed decisions about implementing such fees and it can be used to determine how best to address those concerns. Previous studies on price fairness also note that when users believe that a fee is fair, they are more likely to be willing to pay or to pay more than they would otherwise [11,

33]. Whether individuals support the introduction of fees is also affected by whether they know what the money will be used for and whether they think such ends are worth the investment [44]. Behavioral factors, including frequency of visit and loyalty, and economic factors, including price, have also been used to determine users' reaction to such fees, the later having more importance than the former [19]. Clearly communicating the motivation for the fees has also been found to affect the users' fee approval [14]. Having never paid such fees also leads some users to consider fees as being unfair [25]. Research examining willingness to pay for safaris in Tanzania notes that even where additional fees are actually paid, it is unclear how that extra money is distributed within the local economy [24]. Thus, including social groups in the decision-making process may also be important in affecting users' fee acceptance and social equity [35].

Whereas both options - introducing park entrance fees and raising existing fees for paid services - may be available to attraction managers, previous studies tend to focus on one or the other. Although the equity implications of such fees and park users' willingness to pay the said fees are interrelated, they have also not always been studied altogether. Neither do such studies always determine the discounted net present value associated with implementing such a change in fee structure. While determining perceived equity is valuable, empirically testing past, present, and future park use differences among groups of visitors could provide a more direct evaluation of differences among groups of visitors. Whereas comparing park use differences between local and international visitors provides valuable insights, failing to assess differences among local visitors can also preclude equally important information. In this paper, we bridge these gaps. Given the relevant socioeconomic differences between local and international visitors, we also estimate two separate models for a more accurate measurement of the factors that significantly predict each group's willingness to pay. Such an approach provides better analytical insights compared to an approach that either focuses only on local visitors or international visitors, or combined both together.

3. Methodology

Due to the high population as well as to avoid problems in identifying every member of the population, the study utilized stratified random sampling. The population from which the sample was sourced was the visitors of PBG. Respondents were informed that the research will help the government and in the end the park's authority may be able to understand both user and non-user's expectation regarding the importance and value of green space existence. Data collection was conducted using face-to-face interviews where 250 questionnaires were distributed February and April 2014. The response rate was 92%. The survey was done during weekdays, weekend and public holiday from 8 am to 6 pm. On average, each respondent took around 5 to 10 minutes to successfully answers all questions provided with the assistance of interviewers on site. Respondents had successfully answered the questionnaires, which consisted of three different sections. When designing the survey questions, extra attention given in order to make sure the survey is interesting even for first-time visitor and light-users of urban forests.

On-site face to face interviews with the visitors (local and international) was conducted at PBG. A pilot test was conducted in the first week of February 2014, before the formal field survey actually took place in the following weeks. Both pilot and formal interviews were conducted by trained enumerators. A pilot test is important in order to eliminate any potential issues in constructing the final questionnaire set. A survey with a total of 50 respondents was involved in the pilot test. The pilot test's respondents were randomly selected from the study area. Furthermore, the pilot test itself could be considered as a warming up exercise for the enumerators to make them familiar with the topic, issues as well as the study area itself.

At the beginning of each interview session, respondents were informed of the purpose of the survey where the survey was to investigate how much there are willing to pay for entrance fee in order to improve the ecotourism and management attributes' quality available at the park. They were also informed that their responses may help to improve policymaking and decisions related to the park in the future. To add, the survey was administered in both Bahasa Malaysia and English to reduce any language barriers and the choice of the language is based on the respondent's convenience and understanding.

We used the current average amount respondents usually spent on paid recreational services and the new, higher amount they are willing to pay to determine how much more money, in percentage terms, the respondents are willing to pay for the area. Given the continuous nature of the data, we used the ordinary least squares approach to model the data. For a given set of explanatory variables denoted by Xs and their respective coefficients denoted by βs, the statistical significance of the variables and of the whole model can be estimated using this approach.

For Y, the dependent variable, the following model was estimated

$$Y = \alpha+\beta_1X_1 +\beta_2X_2 + \dots \beta_nX_n + \varepsilon \quad (1)$$

The Xs, ranging from 1 to n, capture the respondents' attributes including age, income, level of education. The βs represent the coefficients of the respective variables. Variables with p values less than 0.05 are statistically significant at 95% confidence level.

The diagnostic tests (the Q-Q plot and corresponding Lilliefors confidence bounds for the test of normality, the variance inflation factor for multicollinearity, and t-test and effect leverage test for the residual by the predicted plot for heteroscedasticity) we performed on the estimates showed reasonable consistency with relevant assumptions. The Q-Q plot test we performed on the residual, the difference between observed and predicted values, shows a statistically insignificant difference to a zero mean expectation. The effect leverage test we performed to determine a pattern between predicted and residual values shows no significant pattern. The variance inflation factors were also consistently below 2, showing limited multicollinearity concerns. In addition to the results of the diagnostic test, taking the continuous version of the data, and hence the regression method, keeps us from losing information associated with dichotomizing the data.

Predefining entry and exit threshold p values, we use the stepwise regression approach method to define the final models. Rather than imposing the number and structure of variables on the model, this approach allows the final model to be determined after an iterative optimization process, best fitting the data [30].

Theil's uncertainty coefficient measures if and how well we can predict a certain outcome given a relevant variable. Ranging between 0 and 1, it indicates that knowledge of the given relevant variable reduces error in predicting the outcome of interest. The higher the coefficient is, the higher the accuracy of prediction [2]. The coefficient, U, can be computed as:

$$U + [2(H(X) + H(Y) – H(XY)) / H (X) + H (Y)] \quad (2)$$

where $(X) = \sum_i (n_i) ln\left(\frac{n_i}{n}\right)$, $H(Y)= -\sum_j \left(\frac{n_j}{n}\right) ln\left(\frac{n_j}{n}\right)$, and $H(XY)= -\Sigma_1\Sigma_j \left(\frac{n_{ij}}{n}\right) \ln\left(\frac{n_{ij}}{n}\right)$ X and Y are variables of interest and n_s are cell counts.

4. Results and Discussion

4.1 Socio-economic Characteristics

A summary of the socioeconomic profiles of respondents is presented in Table 1. The total number of respondents surveyed was 250 visitors. The respondents' interviewed ages 18 years and above, with the highest sampled age group fall in between 21 to 30 years old (38.8%). There are 54.0% male and 46.0% female respondents, signifying almost an equal share of both genders. This can be explained by the pattern of visitation where most of the respondents are likely to come with their partners and family. In terms of the education level, more than half of the respondents are undergraduate degree holders (55.6%), followed by 25.6% of respondents with secondary education level, 15.6% attained postgraduate education and finally 3.2% of respondents with primary education level.

Table 1
Socioeconomic Profiles of Respondents

Variable		Frequency	Percentage (%)
Gender	Male	135	54.0
	Female	115	46.0
Age	Below 20 years old	68	27.2
	21 - 30 years old	97	38.8
	31 - 40 years old	57	22.8
	41 - 50 years old	16	6.4
	51 - 60 years old	12	4.8
	More than 61 years old	0	0
Educational level	Primary	8	3.2
	Secondary	64	25.6
	Undergraduate	139	55.6
	Postgraduate	39	15.6
Working status	Employed	137	54.8
	Unemployed	85	34.0
	Retired	3	1.2
	Other	25	10.0
Monthly Income	< MYR 3000 (Low)	8	3.2
	MYR 3000 – 5000 (medium)	38	15.2
	MYR 5001 – 9000 (high)	99	39.6
	> MYR 9001 (very high)	15	6.0
Nationality	Domestic (Malaysian)	223	89.2
	International (Foreigner)	27	10.8

The respondents' employment status is a significant variable as it is very much likely associated with both respondents' income and education level. The top percentage that covers 54.8% of visitors was recorded to be employed. Only a minor population of the sample is categorized as unemployed (either not working/working part-time/retired). This is a result of trained enumerators who has been unmistakably reminded to not distribute their questionnaires to students and individuals below the age of 18 years old as they were likely not working and thus, reveal no income.

In terms of the total monthly income, the ranges were classified into four sets of income groups that comprise of; (i) total monthly income less than MYR3,000 (low); (ii) total monthly income between MYR3,000 to MYR5,000 (medium); (iii) total monthly income between MYR5,001 to MYR9,000 (high); and (iv) total monthly income more than MYR9,001 (very high). Most of the interviewed visitors placed within the medium or high-income group (15.2% and 39.6%, respectively). More than doubled portion difference in these two income clusters might be due to the presence of

foreign visitors whose salary were comparatively higher due to the currency exchange rate as compared to the Malaysian Ringgit (MYR).

4.2 Willingness to Pay

While 38.75% of the local visitors are not willing to pay for entrance fees, only 33.53% of the international visitors are unwilling to pay, a statistically insignificant difference. Of the respondents who expressed unwillingness to pay, 63% said that public park is local government responsible and prices for the park activities are already too expensive. Stated values that are higher than existing fee indicate that the park manager has underestimated the value of the service to those users.

The factors that predict willingness to pay for local and international visitors are not all the same. Even within a given group of the respondent, such as local visitors, the factors that significantly predict willingness to pay for park entrance are different from those that significantly predict willingness to pay extra money for paid recreational services. This suggests that visitors who are willing to pay park entrance fee may not all be the same ones who are willing to pay extra for paid recreational services offered. While the significant variables can be used to identify and target visitors for differential pricing, the visitors willing to pay for one may not be willing to pay for the other.

4.2.1 Willingness to Pay: International Visitor

The outcome variable assesses how much more visitors are willing to pay, given the current amount that they are paying for paid services, International visitors' willingness to pay extra money for recreational services and whether they intend to visit the park again is as significant as predicted. Table 2 lists the factors that are considered in the final regression model. It also shows which variables are statistically significant in predicting international visitors' willingness to pay more for recreational services and which variables are not significant. Accordingly, compared to international visitors who was a first time visitor, those that have visited more than once are willing to pay extra for recreational services. This could be a result of them having better information regarding their options and the features that the park offers. Whereas previous studies have looked at how past visitation experience affects willingness to pay, finding that having visited a site before negatively affects willingness to pay, our study adopted a future-oriented approach and finds that likelihood to visit again in the future has a significant and positive effect on willingness to pay [31,44]. Accordingly, visitors who plan to visit the site again, suggesting that they have had an experience they would like to repeat, are also more willing to pay extra money for recreational services as compared to those that do not intend to visit the sites again. Bhandari and Heshmati [4] also note that socioeconomic attributes and tourism behaviors including payment history, number of visits, and satisfaction can affect willingness to pay.

Table 2
Summary results of international visitors' willingness to pay more for recreational services

Respondents Attribute	Estimate	Std.Err	t	*p*
Intercept	2165.61	1403.21	1.54	0.128
Number of Visit [1 to 3 times vs 0 time (first time)]	3900.24*	1698.22	2.3	0.025
Average cost spent per person MYR 30 to 50 vs < MYR 30	1884.49	1493.08	1.26	0.212
Average cost spent per person MYR 50 to 100 vs MYR 30 to 50	-1324.61	1857.72	-0.71	0.479
Average cost spent per person >MYR 100 vs MYR 50 to 100	663.079	3922.67	0.17	0.866
Visit again (yes vs no)	2711.17*	1347.48	2.01	0.049

- Indicates that the result is statistically significant at the 95% confidence level

The mean predicted value is 1.29 with a 95% confidence interval, showing that on average respondents are willing to pay 29% more than they do currently. The model did not yield variables that significantly predict willingness to pay for park entrance fees by international visitors. This suggests that no one particular attribute statistically stands out in predicting willingness to pay, not that they are unwilling to pay. The predicted mean entrance fee came out to be MYR 3.42 at 95% confidence interval.

4.2.2 Willingness to pay: Local visitor

Local visitors' willingness to pay more for recreational services is significantly predicted by their average monthly income. Table 3 lists the factors that are considered in the final regression model. This table also shows which variables are statistically significant in predicting local visitors' willingness to pay more for paid recreational services and which variables are not significant. In terms of the money spent on provided activities, the willingness to pay more is not unidirectional.

Table 3
Summary results of national visitors' willingness to pay more for paid recreational services

Respondents Attribute	Estimate	Std.Err	t	*p*
Intercept	1.21	0.06	20.87	<0.0001
Age <40 vs >40	0.009	0.02	0.42	0.672
Age <30 vs 30 to 40	-0.039	0.023	-1.61	0.110
Education (Secondary & below vs Diploma & above)	-0.07	0.048	-1.44	0.154
Average monthly income <MYR 5000 vs >MYR 5000	0.04*	0.02	1.87	0.065
Amount spent per visit MYR 30-50 vs < MYR 30, > MYR 50	-0.05*	0.02	-2.59	0.011

* Indicates that the result is statistically significant at the 95% confidence level.

The mean willingness to pay value for national visitors was MYR 4.35 with a 95% confidence interval. This amount is comparable to the fee for the guided walk, valued at MYR 5. This suggests that local visitors are willing to spend the same amount of fee yet they forego enjoying an additional recreational service. The predicted mean entrance fee for national visitors is MYR 1.66. Willingness to pay for park entrance is significantly predicted by their level of education, who the tourist is traveling with, average cost, type of trip, and how many times the tourist has visited the site before.

Respondents who came to visit the park with their friends are more willing to pay a park entree fee compared to those who came alone. Travelling in with company has been noted to affect other tourism behaviors, including repeat tourism, the results show that it can also predict a visitor's likelihood to pay park entrance fee [6]. Additionally, visitors who have visited the site before, showing strong satisfaction with the experience the park has to offer, and also more willing to pay park entrance fees compared to those who are first time visitor. Prior visitation experience with a given attraction has been noted to affect the content and the degree of information search a visitor performs [22,8,12,16]. Our results suggest that it can also affect ones' likelihood to be willing to pay entrance fees.

Conflicting results exist about how income affects visitors' response to the price change, some finding that low-income respondent tends to be sensitive to price changes while others show limited such effect [23,26]. Our results show that the effect may be context specific. Whereas income is significant in affecting willingness to pay among local visitors, it is insignificant in affecting willingness to pay among international visitors. Compared to visitors who earn more than MYR 5000 a month, visitors who earn lesser are willing to pay more for recreational services. While this may seem unexpected, a closer look at the park use and spending patterns provides a plausible explanation. Local visitors who have lesser economic means are statistically more likely to report a lower per

capita daily spending, have a low participation rate in paid recreational activities, and they are more likely to be involved in all forms of cost-saving practices.

Compared to visitors with an undergraduate level of education, those with primary or secondary school level of education are more willing to pay park entrance fees, because they also spend less time and money on paid recreational activities. A higher level of education has also been shown to affect willingness to pay, those having higher educational attainment being more aware of environmental degradation concerns, appreciating the importance of conservation and thus being more willing than others to pay to conserve such resources [5,40].

Visitors who have spent more than MYR 100 on average, those well above the average spending level, are also more willing to pay park entrance fees compared to those that have spent less. Like income, the effect of gender on the willingness to pay has been mixed, some reporting significant results while others insignificant results [17,26,31]. Our results do show too, significant results for both local and international visitors, both for increasing existing fees and introducing park entrance fees.

Given that the current fee structure differentiates between local and international visitors, introducing park entrance fees and increasing existing fees on paid services could impact local and international visitor composition. Part of the local visitors who used to pay for recreational services is no longer willing to pay, if fees are increased. The ones who are willing to pay have a relatively lower tendency to participate in recreational services even at current prices, now having even less to spend after the fee hike takes effect. Considering that not all local visitors are willing to pay for park entrance and a hike in fees for recreational services, such change in fee structure could reduce their representation at the park, and impact the existing park usage.

Instead, if local visitors, especially those with lesser means, paid less for the recreational services than they do currently, while continuing not to pay for park entrance, they might spend more time at the park and better explore both paid and non-paid recreational services that are offered at the park.

5. Conclusion

Revenues from ecotourism have the potential to support a growing nature-based tourism industry in Putrajaya, which boasts of a rich combination of existing flora and fauna with man-made natural wonder. An economic tool in the form of a user-fee based framework can allow for better management of Putrajaya's valuable urban forest and wildlife resources and provide a long-term source of sustained livelihoods for individuals benefitting both directly and indirectly from the park. The design of a user-fee based economic model must meet the dual objectives. On the one hand, the fee should be set such that it maximizes possible revenues to support administrative, operational and management costs associated with park maintenance and provision of a memorable experience for tourist visitors. On the other hand, an imposition of user fees must preserve social equity and should not unduly exclude any parts of the local population from enjoying a resource that truly belongs to them.

The results of our analysis show that park managers can use differences between international visitors and local visitors as well as differences among local visitors in order to design a payment mechanism to meet the stated dual objectives. Variations in income and education levels, international visitors having higher park use compared to local visitors and 'elite' local visitors having higher park use compared to the rest of the local visitors are vital pieces of information that could benefit policy makers and park managers to devise frameworks that are in the best interest of the country's nature-based tourism industry. Furthermore, our analysis shows significant differences

including the number and type of paid recreational services visitors participate in and the number of times they have visited the park in the past.

The results show positive willingness to pay values both for park entrance and recreational services fee hikes for local and international visitors alike, international visitors being more willing to pay and having higher mean willingness to pay values. Among others, visitors' willingness to pay is predicted by level of income and education, the number of prior visits, average cost, and intention to visit again. Future studies can explore the policy challenges, as well as administrative viability of implementing changes to the user-fee structure by considering the potential for gradual adjustment and broad-based agreement from all stakeholders likely to be affected by such policy interventions.

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