

The Willingness to Pay for Conservation Fee of Urban Green Space: A Case Study of Kota Damansara Forest Reserve, Malaysia

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Abstract

In recent years, Malaysia's total forest area has decreased due to rapid urban growth. Urban green spaces (UGS) act as forested land in a township. We assess the importance of UGS by estimating the visitors' willingness to pay (WTP) for a hypothetical conservation fee for Kota Damansara Forest Reserve (KDFR) in Kuala Lumpur, Malaysia. This study applied the Contingent Valuation Method (CVM), where the Double-bounded dichotomous choice (DBDC) format was adopted. Primary data were obtained from 400 recreationists within KDFR. Trained enumerators conducted interview sessions at main trailheads and recreational spots in KDFR. SPSS Statistical Software version 22 was employed for descriptive analysis of the respondents' socioeconomic characteristics. STATA 14 was used for multiple regression analysis and to estimate the willingness to pay. The findings show that recreationists in KDFR are willing to pay a conservation fee of RM 5.22 per person/visit. By multiplying the WTP with the population, the conservation value for 2020 is estimated at RM 243,907.80. The results of this study would specifically assist other government authorities in administering their land use when it involves recreational and conservation consumption in urban areas through financial information.

Keywords: Conservation fee, urban forest, double bounded dichotomous choice, urban green space, willingness to pay

Introduction

The Importance of Urban Green Spaces (USG)

Greenery in urban areas is essential since over half of the world's population lives in urban areas (Kondo *et al.*, 2018). This proportion is estimated to increase by around 60% by 2030 (United Nations, 2016). Urbanisation is primarily planned in developed countries (Rafiq *et al.*, 2016); cities also continue to expand in more advanced and industrialised companies

(Dallimer *et al.*, 2011). However, rapid urban growth has put urban environments under pressure from habitat degradation, loss of biodiversity, and pollution (Tian *et al.*, 2020). Cities depend upon urban ecosystems and their parts to provide long-term support for life, safety, protection, social capital, and other aspects of people's welfare (Costanza *et al.*, 2006; Tzoulas *et al.*, 2007).

Malaysia's rapid urbanisation and economic expansion have an impact on urban green spaces (UGS) for growth and urbanising degradation and deforestation (Azman *et al.*, 2017). UGS must, however, be conserved because, by 2020, it is estimated that 75 percent of Malaysia's population will live in urban areas (United Nations, 2016). While most urban greeneries are for their aesthetical and recreational functions, conservation plays a significant role.

Conservation is nature restoration and protection, thus facilitating ecologically sustainable use of urban greeneries (Australian Capital Territory, 2013). This function should involve preserving natural life support and ensuring that the benefits of use to present generations do not decrease the ability to meet future generations' needs and aspirations (Queensland, 2015). Conserving efforts also contribute to minimising land loss, conserving carbon and nutrients, biodiversity, and monitoring the global and national environment in urban green spaces (Nilon *et al.*, 2017).

The Case of Malaysia

In Malaysia, governmental agencies have made efforts to conserve UGS. In the Eleventh Malaysia Plan (EMP) 2016-2020, the Malaysian government stressed the importance of conservation. Conservation was highlighted in one of the six strategic thrusts of the national plan. The plan emphasises conserving and protecting the precious environment and natural endowment by reinforcing commitment to green growth for the present and future generations (Eleventh Malaysia Plan, 2015). Conservation efforts in the EMP are relevant to the Sustainable Development Goals (SDG). Listed under Goal 11, one of the SDG objectives is to have sustainable cities and communities by making cities and human settlements inclusive, safe, resilient, and sustainable.

However, economic assistance and grants, private donations, or government funding will be used to help protect wildlife and native biodiversity. The protected areas are subject to minimal financial incentives to improve protection (Lal *et al.*, 2017), and the economic situation is worse for unregulated forests. Entry fees, taxes, and levies on tourism or targeted donation programs may be the source of funds (Iranah *et al.*, 2018). Table 1 shows some previous studies on conservation fees in Malaysia.

Table 1:

A previous study on conservation fees in Malaysia

Author and Year	Study Site	Value estimation
Zharif (2018)	Giant Panda Conservation Centre, Zoo Negara Malaysia	RM24.88/person
Thalany <i>et al.</i> (2017)	Santubong National Park, Sarawak	RM8.41/person
Siew <i>et al.</i> (2015)	Paya Indah Wetland, Selangor	RM7.12/person
Kaffashi <i>et al.</i> (2015)	National Elephant Conservation Center, Malaysia	RM5.15/person
F Musa <i>et al.</i> (2021)	Kinabalu Park	RM5/person

The Issues of the USG in Malaysia

In Malaysia, conservation in the UGS area can be evidenced by establishing parks and forest preservation in metropolitan areas. Kuala Lumpur and Selangor, being Malaysia's capital, have urban green spaces in their perimeter, where Kota Damansara Forest Reserve (KDFR) is one of the largest. While governmental agencies manage most recreational forests in Malaysia, KDFR is jointly managed by the community living around the area and the managing authority, the Selangor Department of Forestry. This partnership is due to the significant participation in recreational activities and the establishment of recreational facilities in KDFR. Since the opening of the forest park in 2010, visitors have never been charged any fee for the usage of the park.

KDFR is surrounded by massive development, and this had its impact on this forested area. This UGS is susceptible to land loss for development due to the insistence of growth for the past few decades. The forest area has been reduced from 16,285 acres in 1898 to 7,175 acres in 1972 (Department of Forestry Selangor, 2012). In 2022, the total area of KDFR was only 794.94 acres, according to the Department of Forestry Selangor.

Many environmental issues are triggered partly by unreasonable decisions surrounding the trade in natural resources to the development sector. Deforestation, intensification of cultivation, wetland drainage, construction, and pollution destroy flora and fauna and their habitat at a critical pace. While most human activity costs something, many precious natural resources tend to be neglected in their conservation values (Trousedale & Gregory, 2004; Mukrimah *et al.*, 2015). Prices do not indicate interest. There is also an overestimation of the advantages of growth. Despite various factors, sometimes referred to as market failures, natural resource benefits are underestimated (Leong *et al.*, 2005; Matthew *et al.*, 2019). In monetary terms, the profound advantage of natural resources, such as ecological processes and biodiversity preservation, is hard to describe. Unlike the typical items sold on the market, most natural resources are often considered common property. That means they are treated like they do not belong to anyone, although they can belong to everyone. Consequently, the community cannot adopt protection measures promoted by ownership, as there are only a few protected areas privately owned and managed by individuals or organisations.

The conservational value of KDFR is a non-market value; thus, it places importance on estimating the conservational value in the monetary unit. Suitable valuation technique choices for non-market value provide more details of the natural resources. Hence, the effects

of market failure can be minimised. The Contingent Valuation Method (CVM) has often been the practical option in non-market valuation studies. Concerning the non-market characteristics, we apply a CVM technique to assess the conservational value of KDFR from the perspective of its users.

The values estimated will help the local communities and the government in terms of the management and conservation of the KDFR. If there is no action from any parties by today, we may lose our valuable forest. Therefore, this study will help reduce the literature gap about the importance of the UGS through economic valuation methods.

Materials And Methods

Study Area

KDFR is located in the city centre of Damansara. KDFR is a part of Sungai Buloh Forest, which covers an area of 794.94 acres (refer to Figure 1). KDFR has been a permanent forest reserve since it was gazetted in 2010. As many as 178 species from 45 timber family groups are recorded in KDFR, home to some protected faunas. Eight bird species that are almost extinct according to the IUCN Redlist, namely Reddish Scops-owl (*Otus rufescens*), Fluffy-backed Tit-Babbler (*Macronous ptilosus*), Black Hornbill (*Anthracoceros malayanus*), Black magpie (*Platysmurus leucopterus*), Yellow-crowned Barbet (*Megalaima henricii*), Buff-necked Woodpecker (*Meiglyptes tukki*), Black-and-yellow Broadbill (*Eurylaimus ochromalus*) and the Short-tailed Babbler (*Malacocincla malaccensis*) can be found in this permanent forest reserve.

We selected KDFR as our study site due to its strategic location. Located in the city's heart, this forest reserve contributes indirectly to environmental services, which benefit a community of over 22,000 residents within a 5km radius of the Reserve (Politika, 2022). Thus, KDFR is a perfect UGS for the public in the vicinity. It provides ecological functions and serves as a recreational park for the communities. Some of the popular recreational activities are mountain biking and hiking. Although KDFR is gazetted as a forest reserve, the forest is open to the public. This UGS serves as a venue for a nature-based outdoor recreational activities site for Kuala Lumpur. The eight mountain biking routes, creating 14 km length trail networks, are up to the International Mountain Biking Association standards. Meanwhile, another 3.5km hiking trail is dedicated to foot trekking.

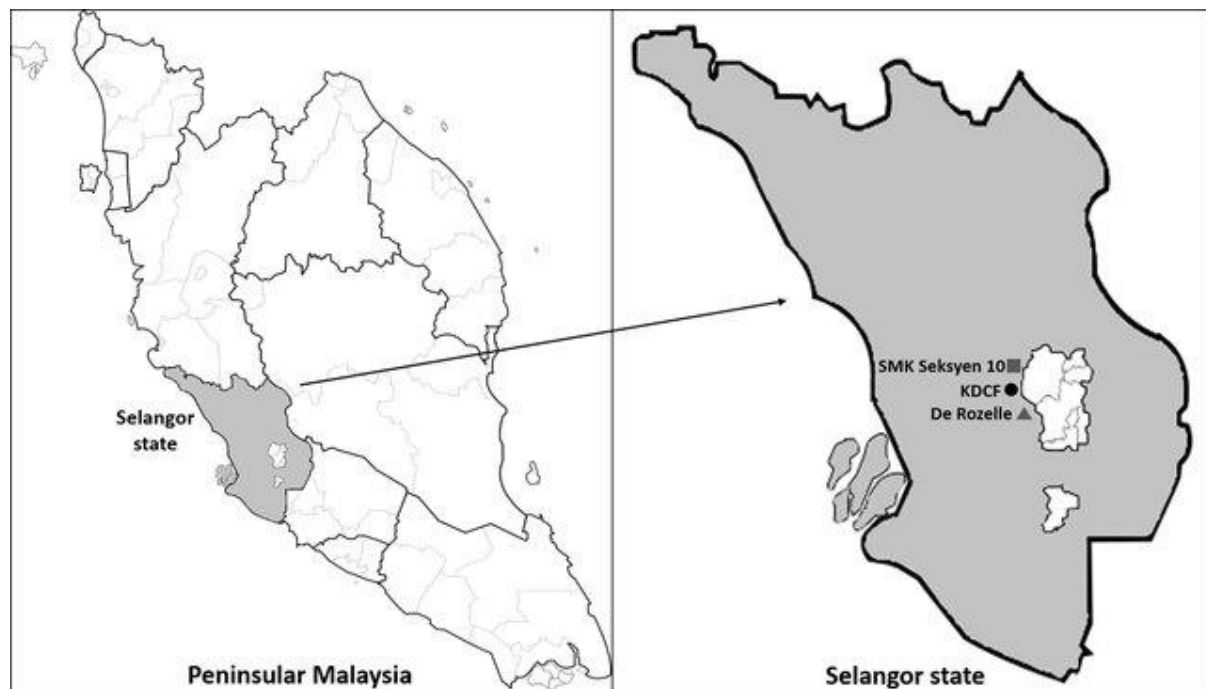


Figure 1: Location of KDFR in Selangor, Malaysia

Source: Lee et al. (2020)

Survey Design

This study interviewed visitors in KDFR as the respondents and identified their WTP for conservation. For the most effective approach in CVM trials, we have used the face-to-face interview suggested by Guo *et al.* (2014). CVM will likely establish anchoring and other forms of discrimination (Bateman *et al.*, 2008). Before the actual data collection, we carried out a pilot study to minimise the risk of incorporating informal discrimination in our research. A random sample of 30 respondents was chosen for the pilot survey. The interview sessions were conducted by trained enumerators who understand the projects. The total population of Kota Damansara is about 163,674, and only 118,827 of them are 18 years old or above (Politika, 2022). To perform the sample size calculation, we define the error ε , or the maximum distance by which the sample value deviates from the actual value. To do this, use the confidence interval of 95% and solve the resulting equation for a sample size n . The formula for calculating the sample size is as follows.

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2} \quad [1]$$

Based on the sample size formula above, the sample size that needs to be collected is 383. The actual survey was conducted, and 400 respondents were surveyed. To address questions from the questionnaire, the respondents had to be at least 18 years old. Random sampling was used as the sampling method with systematic sampling. In systematic sampling, every 5th member is selected for inclusion in this case study.

Every visitor coming out from three exits of KDFR (i.e. Jalan Merbuk 11/1, Seksyen 10 and Jalan Rimba Riang 9/1 at Kota Damansara) was interviewed. If the selected respondent refused to be interviewed, the enumerator chose the following visitor. Each interview session took approximately 20-30 minutes per respondent. Before the interview session began, the respondents were briefed on the purpose and objectives of the interview.

A total of 5 different starting bids were applied in this study. The five different starting bid price is RM3, RM5, RM10, RM15, and RM20. The respondents were asked if they would pay for the starting bid based on the set randomly selected for each visit. If they are willing to pay for the starting bid given, then the bid price will be increased by RM2 for the case bid RM3 and RM5 for the instances of bid RM5, RM10, RM15 and RM20. The bid price will be reduced if the respondent is unwilling to pay for the stated bid at the increment rate above for each bid.

Pilot Survey

The pilot survey is very critical for the validity of the types of questions, and the reliability and problems in the design of the questionnaire were also tested. The pilot survey for the study included 30 questionnaire respondents. The pilot test was completed within two weeks and used face-to-face interviews. Among the pilot's objectives, the survey is to ensure that the questions in the questionnaire can be understood and quickly answered by respondents. In addition, time is also taken during each question and answer session. It determines the average time a respondent requires to answer the questionnaire.

As a result of this pilot survey, it requires an experienced interviewer on CVM questions to explain clearly to each respondent. In addition, respondents will also be more sensitive if asked money questions, requiring an interviewer who is good at controlling the situation. The word entrance fee has been changed to conservation fee, which is seen more as a non-coercive payment than the word entrance fee.

Questionnaire Design

The questionnaire consisted of four sections. The first section was about visits and travel characteristics. The section captures the information describing the travel patterns and recreational activities engaged among visitors in KDFR.

The second section focused on the visitors' satisfaction and perception of the importance of the events and facilities provided by KDFR. Satisfaction and importance levels were measured based on a five-point Likert scale with scores of Very dissatisfied (1), Dissatisfied (2), Neutral (3), Satisfied (4), and Very satisfied (5).

The third section was comprised of WTP questions. Before answering the questions, respondents were posed with a hypothetical scenario. The hypothetical scenario developed as below:

Kota Damansara Community Forest Reserve (KDCFR), or Community Forest, is a part of Sungai Buloh Forest Reserve. KDCFR was gazetted in 2010 as a Permanent Forest Reserve. Besides that, KDCFR was opened to the public as a recreation area. The uniqueness of KDCFR is that it is one of the forest areas located amidst the developing area. Various natural resources, including flora and fauna species, are a significant factor in why this area has been chosen among public visitors. It is intended to provide opportunities for public visitors to connect with nature. Various recreational activities can be performed by public visitors who visit KDCFR. Since this park was opened, visitors have never been charged the entrance fee. The diversity of biodiversity is essential for the stability of the natural ecosystem. Conservation efforts are necessary to ensure the sustainability of biodiversity. To ensure that conservation efforts are sustainable, financial factors are crucial.

The scenario described a hypothetical situation where a conservation fee is imposed upon entrance to KDFR. It also explained the purpose of the proposed conservation fee. A double-bounded technique was employed, where respondents indicated their WTP at two levels of price (Hanemann, 1984). The bids applied in this study were set through the pilot survey that has been carried out. During the pilot survey, respondents were asked how much they would pay per visit. Through the maximum amount stated, we developed five bids that the respondents mainly said during the pilot survey.

Respondents then answered the questions by stating if they were willing to pay for a certain proposed amount of conservation fee. Respondents then answered a follow-up willingness to pay question at a higher or lower bid. Based on Fig. 4, firstly, the respondents were asked for two rounds of repetitive bids, which are RM5, RM10, RM15 and RM20. This question determined whether the respondent was willing to pay a pre-chosen amount, which was randomly selected. If yes, the respondent will be asked another pre-chosen question, where the bid is higher than the first bid by RM2 based on the response collected from the pilot survey. On the other hand, if the answer is no, the respondent still needs to answer the WTP question, but this time, the pre-chosen bid is lower than the first one. After the two separate questions, an open-ended question on the maximum WTP is asked.

The final section recorded socio-demographic information such as gender, age, income, level of education, and occupation.

F1. By considering your income and expenses, are you willing to pay (RMX) for conservation in KDFR?			
<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No
F2. If yes, are you willing to pay RMY?			
<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No
F3. If no for question F2, are you willing to pay RMZ?			
<input type="checkbox"/>	1. Yes	<input type="checkbox"/>	2. No
F4. Thus, what is your maximum amount you would be willing to pay for conservation fee at KDFR?			
RM _____ per person/visit			

Figure 4: The dichotomous choice and open-ended questions for WTP

Model Specification

This study's dependent variable, willingness to pay (WTP), is dichotomous. The model comprises the socio-demographic of respondents, type of activities and participation frequency (Table 3), which was adopted and modified from the models by Azman et al. (2017) and Musa et al. (2021). Azman et al. (2017) and Musa et al. (2021) mentioned that the WTP of a person depends on their socio-demographics like income level, education level, how frequently they visit the site and gender.

The functionality of the WTP study is as follows:

$$WTP = \beta_1ANS1 + \beta_2BID1 + \beta_3ANS2 + \beta_4BID2 + \beta_5INC + \beta_6NOVISIT + \beta_7MB + \beta_8EDU + \beta_9MALE$$

[2]

Where:

WTP	= Willingness to Pay (RM/visit)
ANS1	= Initial bid willingness to pay (1= Yes, 0 = No)
BID1	= Initial bid price (Five set of bids; RM5, RM10, RM15, RM20, RM25)
ANS2	= Second bid willingness to pay (1 = Yes, 0 = No)
BID2	= Second bid price, follow-up bid assigned (Higher bid: RM10, RM15, RM20, RM25, RM30) (Lower bid: RM3, RM5, RM10, RM15, RM20)
INC	= Monthly income (RM/month)
NOVISIT	= Number of visits (times)
MB	= Involved in mountain biking activities (Yes = 1, No = 0)
EDU	= Education of the respondents (Degree = 1, Others = 0)
MALE	= Gender of the respondents (Male = 1, Female = 0)

In Equation [1], the dependent variable, willingness to pay, is dichotomous. Respondents only answered "Yes", coded as 1 and "No", coded as 0. This model has five independent variables. Four variables, namely EDU (Education level), MALE (male respondent), and MB (involvement in mountain biking activities), take the form of a dummy variable. The estimation for WTP was calculated using STATA 14, and the value estimated is in Ringgit Malaysia (RM). The mean willingness to pay from the bivariate Probit model can be calculated as proposed by Belay et al. (2020) below:

$$WTP = -\frac{\alpha}{\beta} \quad [3]$$

where

α = constant; and

β = coefficient offered bids to the respondents.

Results and Discussion

Respondents' Profile

The descriptive analysis of the socio-demographic characteristics of respondents is presented in Table 2. The result showed a balanced distribution of male (43.2%) and female (56.80%) respondents. Most respondents (49%) were between 25 and 34 years old. More than half of the respondents (63%) were single. Most of the respondents (80%) had obtained a university degree. Over half of the respondent's (75.8%) monthly income was between RM5,000 and below. Regarding employment, most (24.3%) were professionals and specialists in their sector.

Table 2:
Socio-demographic profile of respondents

Variables	Frequency	
	Number	(%)
Gender		
Male	173	43.2
Female	227	56.8
Age		
18 – 24 years old	69	17.3
25 – 34 years old	196	49.0
35 – 44 years old	83	20.8
45– 54 years old	44	11.0
More than 55 years old	8	2.0
Marital status		
Single	252	63.0
Married	147	36.8
Divorce	1	0.2
Level Education		
Secondary/High School	80	20.0
Associate Degree/Diploma/Degree	294	73.5
Postgraduates	26	6.5
Monthly Income		
RM2,999 and below	187	46.8
RM3,000 to RM4,999	116	29.0
RM5,000 to RM6,999	53	13.3
RM7,000 to RM8,999	15	3.8
RM9,000 and above	29	7.1
Occupation		
Professional, Specialist	97	24.3
Administrative, Executive, management	88	22.0
Wholesales, Retailer	36	9.0
Self-employed	42	10.5
Marketing, Sales, Financial field	22	5.5
Clerical, Service work	38	9.5
Housewife	11	2.8
Retiree	5	1.3
Student	57	14.1
Others	4	1.0

Bivariate Probit Model Analysis

WTP represents the dependent variable, while independent variables were represented by five variables, which were gender, monthly income, education, number of visits, and mountain bike activity.

Out of five, three explanatory variables were found significant at a 95% confidence level (refer to Table 3). Income is substantial in determining the visitors' level of WTP. Income was found to have a positive relationship with WTP. The positive effects of income are shown in previous studies (Tonin, 2019; Sabyrbekov *et al.*, 2020). The result suggests that high-

income visitors are more likely to pay conservation fees than low-income visitors. People with higher incomes would have more disposable income where the extra cash can be allocated to other expenditures, such as recreational equipment and donations, rather than necessities such as food, clothes, and electricity (Nurshazwani *et al.*, 2017).

Mountain biking was found to have a significant positive impact on WTP at a 95% level. The result suggests that mountain bikers had higher WTP than other visitor recreational activities in KDFR. It indicates that mountain bikers knew the implications of mountain biking activities in a forested area. Mountain biking is usually performed in the wilderness and is intensely influenced by the natural setting (Ewert & Hollenhorst, 1997; Syuhada *et al.*, 2013). Li *et al.* (2005) reported that mountain bikers were willing to pay more than other visitors because they believed it would help sustain the forest reserve to continue enjoying their activity. Another possible explanation is the effect of monthly income. We found that mountain bikers have a slightly higher mean income (RM5,000) compared to the national mean monthly household income (RM4,000) (Ibrahim *et al.*, 2019). As discussed earlier, higher income contributes to higher WTP values.

The visitation rate to KDFR showed a significant positive impact on WTP at a 95% level. That means frequent visitors to KDFR would have higher WTP because they frequently enjoyed the services from the environment in KDFR. Repeated natural site visitors were mainly associated with push and pull factors (Hikmah *et al.*, 2013). Push factors are internal motives or forces in a visitor's mind that cause them to search for activities to fulfil their needs. Pull factors are external forces attracting visitors to the destination (Gnoth, 1997). In KDFR, the push factors were the motivations to get fit and to release tension, whereas the pull factors were the naturalness and green area in an urban setting. 45% of respondents who visited KDFR were motivated by the naturalness of the environment (Table 4). A similar pull factor was also reported by Nurshazwani *et al.* (2018) in a study in a mangrove forest. Nevertheless, according to Reynisdottir *et al.* (2008), the number of visits has a negative impact on WTP, which may mean a feeling of control of the site that is owned by fees from frequent users.

Table 3:
Result of the Bivariate Probit Model regression

Variables	Coef.
Constant	3.1005** (5.6157)
Education	0.7684 (1.3739)
Male	0.3295 (1.4075)
Income	0.0004** (0.0002)
No.visit	0.6775*** (0.2225)
Mountain bike activities	5.1493** (2.5071)
Mean WTP	5.22
Pseudo R ²	0.172

Log Likelihood	-454.332
Number of observations (<i>n</i>)	400

Note: The corresponding standard error is given in (...). *, ** and *** indicate significance at 10% level, 5% level and 1% level respectively.

To estimate the economic value of the conservation fee at KDFR, the economic benefit is calculated using the formula whereby WTP towards conservation is multiplied by the number of visits per year. The number of visits per year varies in 2020, with a value of 46,800¹ visitors. The estimated cost of the conservation fee of KDFR was RM 243,907.80.

Willingness To Pay

Employing DBDC, the WTP values for conservation fees in KDFR were assessed at RM5.22 per person/visit. Our estimate is slightly lower than other related local studies (Table 1). Thalany et al. (2017) and Zharif (2018) estimates are somewhat higher due to the entrance fee at the study site. Based on the interview, there are a few main reasons that visitors visit KDFR (Table 4). Based on the collected reasons, the main factor attracting visitors to KDFR is the natural environment or UGS (45% out of total respondents), which is highly limited in a city like Selangor today.

Table 4:

Types of Factors Affecting Visitors Visit KDFR

Factor Affecting Visitors	Percent (%)
Natural environment	45.0
Travel distance	29.5
Recreational activities	13.8
Facilities	6.2
Less crowded	5.5
Total	100.0

The challenge of having an entrance fee is that the entrance fee could influence the starting bidding price. In some cases, this might lead to a higher starting price, hence higher WTP estimates (Suter & Hardesty, 2005; Liang, 2014). In contrast, lower estimates were found without an entrance fee. This study estimates the WTP value (RM5.22) without an entrance fee. Similar to Siew et al. (2015) and Kaffashi *et al.* (2015), our WTP value (RM5.22) falls between the price range of Siew *et al.* (RM5.15) and Kaffashi (RM7.12).

The WTP rate of our results was close to that in previous studies on urban conservation, such as Xu *et al.* (2020), which found that 55.90% of their respondents were willing to pay, and Shi *et al.* (2014) found 57.3% in Sushansi National Forest Park in Wuhan City. However, the WTP rate in this study was lower than other similar studies, such as Adamu *et al.* (2015) reported 77.9% in Yankari Game Reserve, Bauchi, Nigeria; Armira Isha *et al.* (2015) said 68.66% in Puncak Lawang Park, Indonesia and Liu *et al.* (2019) reported 80.8% of their respondents were willing to pay for conservation.

However, half of the respondents (50.25%) were not willing to pay the conservation fee compared with those who were willing to pay (49.75%) (Table 5). Based on the

¹ Source by Department of Forestry Selangor, 2020. All the visitors need to be register before they can be entering to the KDFR.

hypothetical scenario developed during the survey, the importance of the UGS for the communities surrounding it was greatly expanded. The fees collected will be essential to the conservation of the KDFR. However, due to the KDFR as a public good that anyone can consume without any payment and a low level of awareness of the importance of the UGS, it has become the main reason that the majority are not willing to pay for the conservation fees.

Table 5: The proportion of respondents' responses towards WTP

Answer	Percent (%)
Yes	49.8
No	50.2
Total	100.0

As shown in Table 6, 67.7% of respondents mentioned that the government should pay for the conservation fees. As mentioned above, KDFR is a public good that we cannot stop or prevent anyone from paying or not using. There are also 14.4% of the respondents who mentioned that they are willing to take care of the conservation of the KDFR area but will not contribute in monetary terms.

Table 6:

Reason does not pay for WTP

Reasons	Percent (%)
The government should bear the cost of conservation	63.7
Willing to pay but in other ways, not in terms of monetary	14.4
Willing to pay but not the sum of the above	12.1
Cannot afford to pay	9.8
Total	100.0

On the other hand, as mentioned above, KDFR was under the manager of the local communities, but at the same time, some visitors visit KDFR, which may not be a local community. They will feel that they are not directly receiving the benefit from KDFR. Therefore, they are not willing to pay the conservation fees. They also think they are not responsible for conserving the KDFR as they will not benefit directly. It was the main reason that most respondents were unwilling to pay for the conservation fees of KDFR.

Considering that many recreationists were unwilling to pay, this study probed further into why (Table 6). 63.7% of the respondents indicated that the government should finance the cost of conservation because KDFR is in the public domain. Several other reasons were that 14.4% would pay it differently, 12.1% willingly do not pay with the amount specified, and 9.8% cannot afford to pay. In a related study by Fatimah et al. (2020), 27.6% of their respondent thinks that the government should bear the carbon tax. This finding implies that the public believes the conservation budget is the government's responsibility. Additionally, Xu et al. (2020) find that 56.15 % claim the government will compensate for conserving the environment and urban ecosystems owing to their taxes. The study recommended that the

government receive environmental education to increase public understanding of their responsibilities.

Conclusions

The estimated conservational value shows the significance of KDFR as an UGS in Selangor. While public goods usually experience market failure, the study addresses this by assessing the option value². The WTP value estimated was based on the current environmental condition of KDFR, which will not be the same in the future. Therefore, the current natural environment of KDFR is imperative to maintain the visitors' satisfaction, as revealed by WTP. The positive relationship between the two visit characteristics signals the need to promote more visitation for higher WTP, particularly to the mountain biker segment. Mountain bike facilities and services to enrich the cycling experience could be the pull factors of KDFR.

This study also showed that the willingness to pay for the conservation value in KDFR is RM5.22 per person/visit. Visitors believe that the conservation of KDFR is a shared responsibility, and most know that UGS brings positive benefits to them and the people around it. As such, they have decided to donate and are willing to pay the conservation fee at KDFR. However, many visitors were unwilling to pay the proposed conservation fee and believed conservation should be a governmental expenditure.

Efforts to encourage public engagement in conservation are crucial for sustainable nature-based recreation. Maintaining public recreational facilities in the forested area is generally expensive and labour-intensive. Public support could lessen the agency burden, perhaps not necessarily monetary, but in other undertakings like management, maintenance, campaign, and awareness programmes.

The results of this study would specifically assist all the local government authorities in administering their land use when it involves recreational and conservation consumption in urban areas through monetary information. In implementing Thrust 3, an inclusive and quality living environment in the 3rd National Physical Plan and achieving Objective 11 in the Sustainable Development Goal, the government can use the value of this WTP as a reference for its implementation. This value indicates or represents the consumer voice in stating how vital KDFR is to them. By referring to WTP's value, the visitors would be aware of the goals of effectively preserving UGS through engaging in those programs. It will provide long-term support for visitors, the KDFR community and future generations.

The study emphasizes the significance of KDFR as a crucial urban green space in Selangor. Visitors' willingness to pay RM5.22 per person/visit for conservation efforts underscores the importance of KDFR for the community. The study suggests that mountain bike facilities and services can attract more visitors, increase willingness to pay, and enhance visitors' experience. It is essential to encourage public engagement in conservation efforts to ensure sustainable nature-based recreation and preserve green spaces like KDFR. The study's findings can serve as a reference for local government authorities in administering recreational and conservation land use in urban areas. It is recommended that the government take note of the WTP value as a parameter for implementing Thrust 3 and achieving Objective 11 in the Sustainable Development Goal. The authorities should take responsibility for preserving KDFR and providing long-term support for visitors, the KDFR community, and future generations.

² Option value refers to the valuation of an individual's willingness to acquire or retain a public good or service with little or no chance of actually using the public good or service.

References

- Australian Capital Territory (2013). *ACT Nature Conservation Strategy 2013-23*. ACT Government Environment and Sustainable Development Directorate. Retrieved February 20, 2020 from <https://nla.gov.au/nla.obj-1923675194/view>.
- Armira Isha, Mohd Rusli, Y., Ibrahim, K., & Alias, R. (2015). Estimating economic value for potential ecotourism resources in Puncak Lawang Park, Agam District, West Sumatera, Indonesia. *Procedia Environmental Sciences*, 30, 326-331.
- Azman, A. R., Faten, N. T. H., & Shaharuddin, M. I. (2017). Residents willingness to pay for conservation of green spaces and amenities at urban forest Bukit Nanas, Kuala Lumpur. *International Journal of the Malay World and Civilisation*, 5, 81-86.
- Bateman, I. J., Burgess, D., Hutchinson, W. G., & Matthews, D. I. (2008). Learning design contingent valuation (LDCV): NOAA guidelines, preference learning and coherent arbitrariness. *Journal of Environmental Economic Management*, 55, 127-141.
- Belay, G., Ketema, M., & Hasen, M. (2020). Households' willingness to pay for soil conservation on communal lands: application of the contingent valuation method in north eastern Ethiopia. *Journal of Environmental Planning and Management*, 63(12), 2227-2245.
- Chen, W. Y. (2015). Public willingness to pay for conserving urban heritage trees in Guangzhou, south China. *Urban Forestry and Urban Greening*, 14, 796-805.
- Costanza, R., Mitsch, W. J., & Day Jr. J. W. (2006). A new vision for New Orleans and the Mississippi delta: applying ecological economics and ecological engineering. *Frontiers in Ecology and the Environment*, 4, 465-472.
- Dallimer, M., Tang, Z., Bibby, P. R., Brindley, P., Gaston, K. J., & Davies, Z. G. (2011). Temporal changes in greenspace in a highly urbanised region. *Biology Letters*, 7(5), 7663-7666.
- Department of Forestry Selangor (2012). *Kota Damansara Forest Reserve Management Planning Report*. Selangor: Malaysia.
- Department of Statistic Malaysia (2016). *Report on Household Expenditure Survey 2016*. Retrieved January 11, 2020, from <https://www.dosm.gov.my>.
- EEA (2011). Green Infrastructure and Territorial Cohesion, the Concept of Green Infrastructure and its Integration into Policies using Monitoring Systems. *EEA Technical Report No 18/2011*.
- Eleventh Malaysia Plan (2015). Retrieved February 4, 2019, from https://www.pmo.gov.my/dokumenattached/speech/files/RMK11_Speech.pdf.
- Ewert, A.W., & Hollenhorst, S. J. (1997). Testing the adventure model: Empirical support for a model of risk recreation participation. *Journal of Leisure Research*, 21(2), 124-139.
- Ibrahim, N. S. C., Afandi, S. H. M., & Samdin, Z. (2019). Factors Affecting the Demand for Mountain Biking at Putrajaya Challenge Park, Putrajaya. *Journal of Business and Social Review in Emerging Economies*, 5(1), 149-154.
- Kaffashi, S., Radam, A., Shamsudin, M. N., Yacob, M. R., & Nordin, N. H. (2015). Ecological conservation, ecotourism, and sustainable management: The case of Penang National Park. *Forests*, 6(7), 2345-2370.
- Fatihah, N. S., Rahim, A. A. S. & Syamsul, H. M. A. (2020). Are Malaysian airline passengers willing to pay to offset carbon emissions?. *Environmental Science and Pollution Research*, 27, 24242-24252.
- Gnoth, J. (1997). Tourism motivation and expectation formation. *Annals of Tourism Research*, 24(2): 283-304.

- Guo, X., Liu, H., Mao, X., Jin, J., Chen, D., Cheng, S. (2014). Willingness to pay for renewable electricity: a contingent valuation study in Beijing, China. *Energy Policy*, 68, 340-347.
- Hanemann, M. (1984). Welfare evaluations in contingent valuation experiments with discrete responses. *American Journal of Agricultural Economics*, 66(3), 332-341.
- Hikmah, N. Z., Syamsul, H. M. A., Zaiton, S., & Ahmad, S. (2013). Push and pull factors influencing domestic visitors to Kilim Karst Geoforest Park, Langkawi. *Malaysian Forester*, 76(2), 109-116.
- Iranah, P., Lal, P., Wolde, B. T., & Burli, P. (2018). Valuing visitor access to forested areas and exploring willingness to pay for forest conservation and restoration finance: The case of small island developing state of Mauritius. *Journal of Environmental Management*, 223, 868-877.
- Kaffashi, S., Rusli, M. Y., Clark, M. S., Alias, R., & Farid, M. M. (2015). Exploring visitors' willingness to pay to generate revenues for managing the National Elephant Conservation Center in Malaysia. *Forest Policy and Economics*, 56, 9-19.
- KDCF Society (May 10, 2020). Retrieved from <http://kotadamansaraforest.org/about-the-forest/trail-network/>
- Kondo, M. C., Fluehr, J. M., McKeon, T., & Branas, C. C. (2018). Urban green space and its impact on human health. *International Journal of Environmental Research and Public Health*, 15, 445.
- Latinopoulos, D., Mallios, Z., & Latinopoulos, P. (2016). Valuing the benefits of an urban park project: A contingent valuation study in Thessaloniki, Greece. *Land Use Policy*, 55, 130-141.
- Lal, P., Wolde, B., Masozera, M., Burli, P., Alaavalapati, J., Ranjan, A., & Mugabo, R. (2017). Valuing visitor services and access to protected areas: the case of Nyungwe National Park in Rwanda. *Tourism Management*, 61, 141-151.
- Lee, N. S., Clements, G. R., Ting, A. S., Wong, Z. H., & Yek, S. H. (2020). Persistent mosquito fogging can be detrimental to non-target invertebrates in an urban tropical forest. *PeerJ*, 8, e10033.
- Leong, P. C., Zakaria, M., Awang, N. A. G., & Abdullah, M. (2005). Contingent Valuation of a Malaysian Highland Forest: Non-market Benefits Accrued to Local Residents. *Journal of Applied Sciences*, 5, 916-919.
- Li, W., Ge, X., & Liu, C. (2005). Hiking trails and tourism impact assessment in protected area: Jiuzhaigou Biosphere Reserve, China. *Environmental Monitoring and Assessment*, 108(1-3), 279-293.
- Liang, A. R. D. (2014). Exploring consumers' bidding results based on starting price, number of bidders and promotion programs. *International Journal of Hospitality Management*, 37, 80-90.
- Liu, J., Liu, N., Zhang, Y., Qu, Z., & Yu, J. (2019). Evaluation of the non-use value of beach tourism resources: A case study of Qingdao coastal scenic area, China. *Ocean & Coastal Management*, 168, 63-71.
- Matthew, N. K., Ahmad, S., Ramachandran, S., & Syamsul, H. M. A. (2019). Total economic value of ecosystem services in Malaysia: A review. *Journal of Sustainability Science and Management*, 14(5), 148-163.
- Mukrimah, A., Parid, M. M., Rusli, M. Y., Alias, R., & Fui, L. H. (2015). Estimate the conservation value of biodiversity in national heritage site: A case of Forest Research Institute Malaysia. *Procedia Environmental Sciences*, 30, 180-185.

- Musa, N. S. Ahmad Nasir, O. Jaunis & D.D. Mohd Hamdan (2021). Exploring Tourists' Knowledge, Perceptions and Willingness To Pay On Biodiversity Conservation: Insights from Kinabalu Park, Borneo. In *IOP Conference Series: Earth and Environmental Science* (Vol. 736, No. 1, p. 012045). IOP Publishing.
- Nielsen, A. B., Van den Bosch, M., Sreetheran, M., & Van de Bosch, C. K. K. (2014). Species richness in urban parks and its drivers: a review of empirical evidence. *Urban Ecosystem*, 17, 305-327.
- Nilon, C. H., Aronson, M. F. J., Cilliers, S. S., Dobbs, C., Frazee, J. L., Goddard, M. A., ... & Yocom, K. P. (2017). Planning for the future of urban biodiversity: A global review of city-scale initiatives. *Bioscience*, 67, 332-342.
- Nurshazwani, A. R., Syamsul, H. M. A., Ahmad, S., & Ramachandran, S. (2017). Estimating the conservation value of Giant Panda Conservation Centre in Zoo Negara, Malaysia using Contingent Valuation Method. *World Applied Sciences Journal*, 35, 16-19.
- Nurshazwani, A. R., Syamsul, H. M. A., Ahmad, S., & Awang, N. A. G. (2018). Visitors Travelling Time Cost for Ecotourism at Matang Mangrove Forest Reserve. *International Journal of Business and Society*, 19(S1), 117-127.
- Politika (2022). *Population*. Retrieved March 30, 2022, from <https://politika.my/state/selangor/kota-damansara>.
- Queensland (2015). *Nature Conservation Act 1992*. Retrieved January 22, 2020, from <https://www.legislation.qld.gov.au/view/pdf/2017-07-03/act-1992-020>.
- Reynisdottir, M., Song, H., & Agrusa, J. (2008). Willingness to pay entrance fees to natural attractions: An Icelandic case study. *Tourism Management*, 29, 1076-1083.
- Sabyrbekov, R., Dallimer, M., & Navrud, S. (2020). Nature affinity and willingness to pay for urban green spaces in a developing country. *Landscape and Urban Planning*, 194.
- Siew, M. K., Rusli, M. Y., Alias, R., Adamu, A., & Emmy, F. A. (2015). Estimating willingness to pay for wetland conservation: A contingent valuation study of Paya Indah Wetland, Selangor, Malaysia. *Procedia Environmental Sciences*, 30, 268-272.
- Suter, T. A., & Hardesty, D. M. (2005). Maximising earnings and price fairness perceptions in online consumer-to-consumer auctions. *Journal of Retailing*, 81(4), 307-317.
- Syuhada, N. C. I., Syamsul Herman, M. A., & Zaiton, S. (2013). Attributes motivating participation in extreme recreation at Putrajaya Challenge Park, Malaysia. *Malaysian Forester*, 76(1), 91– 100.
- Thalany, K. (2013). Willingness to pay for conservation of natural resources in the Gunung Gading National Park, Sarawak. *Procedia-Social and Behavioral Sciences*, 101, 506-515.
- Thalany, K., Jati, K. A., & Nurul, F.A. H. (2017). Willingness to pay for conservation of natural resources in Santubong National Park. *Jurnal Manajemen dan Kewirausahaan*, 19, 16-21.
- Tian, Y., Wu, H., Zhang, G., Wang, K., Zheng, D., & Li, S. (2020). Perceptions of ecosystem services, disservices and willingness to pay for urban green space conservation. *Journal of Environmental Management*, 260.
- Tonin, S. (2019). Estimating the benefits of restoration and preservation scenarios of marine biodiversity: An application of the contingent valuation method. *Environmental Science and Policy*, 100, 172-182.
- Trousdale, W., & Gregory, R. (2004). Property evaluation and biodiversity conservation decision support for making hard choices. *Ecological Economics*, 48, 279-291.

- Tzoulas, K., Korpela, K., Venn, S., Yli-Pelkonen, V., Kazmierczak, A., Niemela, J., & James, P. (2007). Promoting ecosystems and human health in urban areas using Green Infrastructure: a literature review. *Landscape and Urban Planning*, *81*, 167-178.
- United Nations (2016). *The World's Cities in 2016 – Data Booklet (ST/ESA/ SER.A/392)*. Retrieved December 20, 2019, from www.unpopulation.org.
- Xu, F., Wang, Y., Xiang, N., Tian, J., & Chen, L. (2020). Uncovering the willingness to pay for urban green space conservation: A survey of the capital area in China. *Resources, Conservation & Recycling*, *162*.
- Zharif, L. H. M. (2018). *Willingness to pay of visitors for conservation of Giant Panda at Zoo Negara, Malaysia*. Unpublished Master thesis: Universiti Putra Malaysia. Selangor