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Residents Willingness to Pay for Conservation of Green Spaces and Amenities at Urban Forest Bukit Nanas, Kuala Lumpur

Kesanggupan Penduduk Untuk Membayar terhadap Pemuliharaan Kawasan Hijau dan Kemudahan Ameniti di Hutan Simpanan Bukit Nanas, Kuala Lumpur

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ABSTRACT

Greenery plays a key role in urban ecosystems could generate a wide range of services and amenities. They provide residents with outdoor recreational opportunities and contacts with nature to nurture a harmonious people–environment relationship healthy living environment. Cities of Kuala Lumpur have a growing demand for green spaces, due to growth in populations, improved quality of life, increased leisure time, and rising environmental awareness and expectation. Unfortunately, the recent rapid pace of urban expansion and redevelopment have eradicated or degraded some existing urban green spaces and failed to preserve natural pockets and corridors in large-scale sprawling into green fields. The main aim of this study is to determine the willingness to pay (WTP) and the residents' value of urban green space in Kuala Lumpur city. The results show that 60% of the residents are willing to pay between RM 2 to RM 5 per year for the conservation of the urban green space. The results also indicated that most of the respondents feel responsible towards the existing urban green space and concern towards amenity in Bukit Nanas Forest Reserve.

Keywords: WTP; conservation; green spaces; urban forest Bukit Nanas

ABSTRAK

Kawasan hijau dalam ekosistem bandar boleh memainkan peranan penting menyediakan pelbagai perkhidmatan dan ameniti. Perkhidmatan dan ameniti ini termasuklah menyediakan peluang rekreasi luar kepada penduduk untuk berhubung dengan alam semula jadi serta memupuk hubungan harmoni persekitaran hidup rakyat dan alam sekitar. Permintaan terhadap kawasan hijau di dalam Bandaraya Kuala Lumpur dijangkakan semakin meningkat disebabkan pertumbuhan dalam populasi, peningkatan kualiti hidup, peningkatan masa lapang dan peningkatan kesedaran terhadap alam sekitar. Malangnya kepesatan perkembangan dan pembangunan semula bandar baru-baru ini telah menghapuskan dan gagal melindungi beberapa kelompok dan koridor kawasan hijau yang berskala besar. Tujuan utama kajian ini adalah untuk menentukan kesanggupan membayar (WTP) dan mendapatkan penilaian penduduk terhadap kawasan hijau di Bandaraya Kuala Lumpur. Hasil kajian menunjukkan bahawa 70% daripada penduduk sanggup membayar antara RM 2 hingga RM 5 setahun bagi tujuan pemuliharaan kawasan hijau bandar. Keputusan juga menunjukkan bahawa kesemua responden berasa bertanggungjawab terhadap kawasan hijau bandar yang sedia ada terutamanya di Hutan Simpanan Bukti Nanas.

Kata kunci: WTP; pemuliharaan; kawasan hijau; hutan bandar Bukit Nanas

INTRODUCTION

The rapid urbanisation and redevelopment have eradicated or degraded some existing urban green spaces and failed to preserve natural pockets and corridors in large-scale sprawling into green fields. Unfortunately, less scientific and political-attention is being paid, to conserve that type of nature close to where people live and work, to small-scale green areas in cities, and to their benefits to urban dwellers. All most urbanisation of cities, regeneration strategies mainly focus on man-made and built components of the urban environment. In many municipalities have not specified their urban forest policies and many forested areas are considered as left over areas waiting for more intensive use (Lofstrom 1998). Less or low appreciation to the natural components and the green spaces of the urban structure development also reflected in the maintenance of budget of many towns (Tyrväinen & Väänänen 1998).

Today, preserve the natural environment and urban forest in the urban are mainly concerned either with large, bio-diverse and relatively untouched

ecosystems or with individual animal or vegetal species, endangered or threatened with extinction (Chiesura 2004). Urban forest and greenery function are both as a major factors in attracting tourists and as a complement of other urban tourism magnets of the cities. Urban forests have the ability to significantly add to the beauty of urban areas and improve the experience of urban tourists (Deng, Arano, Pierskalla, & McNeel 2010).

Urban greening such as tree planting or the creation of parks, tree planting along streets, and green roofs has been proposed as one approach to mitigate the human health consequences of increased temperatures resulting from climate change (Givoni 1991). Many studies founded that the air temperature within parks and beneath trees and are broadly supportive that green sites can be cooler than non-green sites. Trees canopies absorb the heat from the surrounding environment and prevents warming (through shading) and cools the building and pavement surfaces (through transpiration and evaporative cooling) (Millward & Sabir 2011). Urban trees can potentially mitigate environmental degradation accompanying rapid urbanisation via a range of tree benefits and services.

Green space and urban forest has significant ecosystem services which are directly or indirectly the benefits human population that contributing to the quality of urban life (Costanza et al. 1997). Urban forests, composed of trees and other vegetation, are integral parts of urban ecosystems that constituent greenery which provides a broad range of benefits, including opportunities for residents to have daily contact with nature, and to enjoy attractive landscapes and recreational activities (Chen & Jim 2008). Urban green spaces and urban forest could generate a wide spectrum of recreational opportunities and amenities are most appreciated by urban residents. However, most of the values attached to green spaces and urban forests such as a pleasant landscape, peace and quiet and potential recreation opportunities are non-priced environmental benefits.

The primary aim of this study was to assess recreational opportunities and amenities provided by green spaces in a Kuala Lumpur city, to calculate the monetary value of such human-use services using contingent valuation method (CVM). In addition, residents' knowledge and recognition of ecosystem services generated by urban green spaces, their expectation of green spaces, and their recreation activities and influencing factors would be explored.

STUDY AREA AND METHODS

STUDY AREA

The study area that has been chosen in this research is Urban Forest Bukit Nanas Forest Reserve. This park is also known as 'Green Lung' for Kuala Lumpur and it is one of the networks of Malaysian Green Heritage that existed in Kuala Lumpur. It's located at between Jalan Ampang and Jalan Raja Chulan with the area of about 9.27 hectares, as Urban Forest in Kuala Lumpur. The park has been established since 1870 with the name as Bukit Weld Permanent Forest Reserve. In 1903 the park was gazetted under Forestry Departments of Peninsular Malaysia, and then in 1934, the park also has been established as wildlife and bird protection area. Subsequently to this, the Forestry Departments of Peninsular Malaysia has established this park as Virgin Jungle Reserve for the purpose of research and forestry science. This urban forest has its own history, which started around the year 1870's during the era of early Malay Sultans'. A total of 151,623 visitors have been visiting the park from 2006 to 2011 (Table 1).

TABLE 1. Number of Visitors from 2006-2011

Year	Total Local	International	Total
2006	14,831	3,459	18,290
2007	22,721	6,279	29,000
2008	20,940	3,265	24,205
2009	23,561	396	23,957
2010	26,527	4,918	31,445
2011	17,613	7,113	24,726
Total Visitors	126,193	25,430	151,623

Source: Forestry Information Centre, Kuala Lumpur, 2012

QUESTIONNAIRE DESIGN

The data used in this study were from a survey of residents' urban forest Bukit Nanas Forest Reserve, Kuala Lumpur conducted in between May and June 2012. The questionnaire used in the survey was designed to extract information on visitors' perceptions of environmental attribute regarding urban forest's benefit, their interest towards urban forest and their willingness to pay for environmental service that offered by the urban forest.

In order to achieve the objectives of the study, the first part of the questionnaire is designed to gather information relating to the visitors' perceptions on the environmental attribute towards the urban forest's benefit, their interest towards urban forest and their willingness to pay for environmental service that offered by the urban forest. While in part two, the questions will concentrate on the evaluation by visitors on existing ecosystem services. The contingent valuation (CV) method was being applied by asking what they are willing to pay (WTP) towards the preservation or an improvement of an environmental asset. Most of urban forest benefits represent non-consumptive use values, which include benefits derived from pleasant landscape, clean air, peace and quiet and screening, as well as recreational activities. One of the methods to measure is using contingent valuation.

Contingent Valuation Method (CVM) is used to measure visitors' willingness-to-pay (WTP) to conserve for ecosystem. The design of the questions to measure the WTP, the respondents were asked to use an open-ended technique in which the respondents state their maximum WTP with no value being suggested to them. The respondents will be informed clearly the purpose of the survey and the benefits that could be derived from the study. They are told to be as realistic as possible and to base their responses on established patterns of behaviour and legal institutions.

SAMPLING METHOD AND DATA ANALYSIS

On-site surveys were conducted at urban forest Bukit Nanas Forest Reserve. Face-to-face on-site self-administered survey was and conducted at the end of their visits. Questionnaires were regarding on visitor's demographic characteristics, visitor perception and, visitors' willingness to-pay (WTP) to conserve the existing ecosystem services. A pilot test was conducted with 30 individual with a different background from the study area. Overall, most of the respondents could answer the questionnaire in less than 5 minutes. The data were analyzed using the SPSS software. An average WTP was calculated for the Bukit Nanas Forest Reserve in Kuala Lumpur City.

RESULTS AND DISCUSSION

A total of 150 questionnaires were completed through face-to face interview at the study area. For socioeconomic profile of the respondents (Table 2), 52% were female respondents, while 47.8% are male respondents. The results show that 26.3% of the respondents which is their age between 30 – 39 years old were the most frequent visitation to Bukit Nanas Forest Reserve. The finding from the analysis on the education level of the respondents indicates that 72.7% of the respondents have tertiary education background while 27.3% of the respondents have secondary education background. The result shows that the private sectors employees were the frequent visits to the park.

TABLE 2. Profile of the Respondents

Gender (N=150)					
Male				Female	
72 47.8%				78 52.2%	
Age (years old)					
<19	20 – 29	30 – 39	40 – 49	50 – 59	>60
27 18.0%	35 23.7%	40 26.3%	21 14.0%	27 18.0%	- -

Education Background	
Secondary Education	Tertiary Education
39 27.3%	105 72.7%

Employment Status					
Government	Private	Self-employed	Student	Retiree	Unemployed
14 9.5%	75 52.4%	14 9.5%	34 23.8%	7 4.8%	- -

Out of 150 respondents, (Table 3) more 60% of the respondents indicate their agreement to contribute to conservation are willing to pay, whereas 39% of the respondents are not willing to pay to contribute for the preservation of urban forest Bukit Nanas Forest Reserve. The higher percentage of respondents that are willing to pay indicates the increasing awareness among the respondents on the importance and significance of urban forest as green lungs that contribute to their wellbeing. They also indicate their willingness to contribute some money for the park maintenance as to ensure the urban park is always in desirable condition.

TABLE 3. Respondents Willingness to Pay

Are the respondents willing to pay to preserve the urban forest?		**Total (N)**
Yes	**No**	
91 60.9%	59 39.1%	100 100%

The results show (Figure 1) that the 36% of the respondents' are willingness to pay was at RM5.00. On the other hand only 9% of the respondent was willingness to pay at the highest amount at RM20.00 and almost 30% of the respondents indicate the willingness to pay at RM2.00. Only 10% of the respondents are willing to pay at RM3.00 and almost 20% of the respondents are willing to at RM10.00.

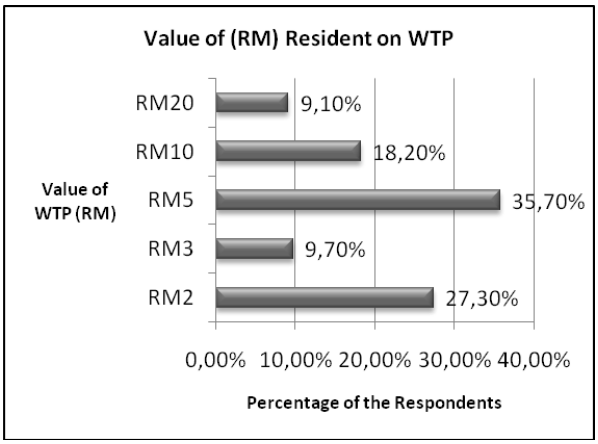

FIGURE 1. Value of (RM) Resident on WTP

The results show (Figure 2) most of the respondents (52%) choose to pay through the entrance fee due to the reason that the payment will go directly to the management of the urban forest. Almost 20% of the respondents prefer to pay on the special fund and 12% of the respondents prefer to pay through buying the merchandise that sell by the management. The results show that 10% of the respondents prefer others way mechanisms of payment for the environmental service such as they suggested through the funding from big companies and volunteering works. The results show that 7% of the respondents were preferred to pay through the deduction from their income tax payment.

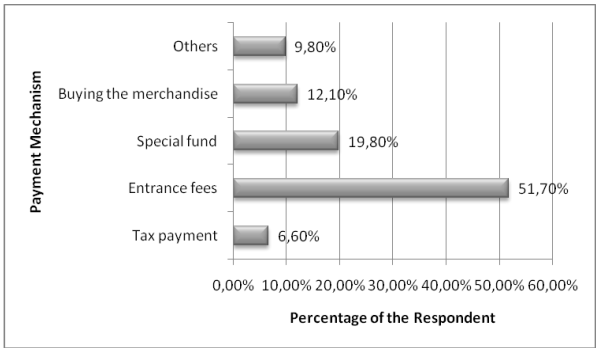

FIGURE 2. Payment Mechanism

The results show (Table 4) that 85% of the respondents show their interest in the conservation of the urban forest with the mean value at 4.39. 85% of the respondents feel that the urban forest is a good place for recreation, education and research with the mean value at 4.61. On the other hand, 64% of the respondents feel unsafe as they perceive that they can threaten by the wildlife and the crime. The results show that the respondent feeling on the safety of park at the mean at 2.3. However, almost 30% of the respondents agree that they feel safe on the existing trail that being provided by the Forestry Department.92% of the respondents agree that it is important to preserve the urban forest will allow future generation to benefit from greenery urban environment. The results show the respondent on the preservation of the urban forest at the mean value is 4.65. 95% of the respondents agreed on the significance and importance of urban forest as conservation area and they as a society felt that they should have given the priority to manage and protecting the urban forest. The results show that priorities for managing and protecting the urban forest as national assets at the mean value at 4.70. On the other hand, 99% of the respondents agree on the replanting program should become a priority as to ensure the sustainability growth of the tree and the greening of the urban park. 64% of the respondent indicates their disagreement logging activities that could distraction the health and the greenery of the environment of the urban forest. Most of respondent think it is better to preserve the urban forest and not to cut trees for logging that could reduce the forest cover in the urban area. The low mean value at 1.96 shows that the respondents are strongly protecting the urban forest. On the hand the results show, 80% of the respondent agrees that the urban forest can become an important conservation area for wildlife habitat. The high mean value at 4.48 indicate that their concern toward protecting the urban forest.26% of the respondents indicate that the urban forest could gain an income to the park through the entrance fee and contribution for conservation from the visitors and the public. The fund from the contribution could support the maintenance of the park and the preservation program. However, 33% of the respondents indicate their disagreement that the park should not to over develop and commercialise as to gain profit. Some of the respondents suggest that it is better to be balance between preserving and developing.

TABLE 4. Visitor's Perception towards Urban Forest Conservation

Statement	Strongly Disagree	Disagree	Moderate	Agree	Strongly Agree	Mean
I am very interested in urban forest.	8 5.4%	6 4.4%	8 5.4%	43 28.4%	85 56.4%	4.39
Urban forest is a place for recreation, education and research.	6 4.4%	5 4.3%	10 6.3%	22 14.7%	107 70.3%	4.61
I feel unsafe to be in urban forest as there are threats for animals' attack and crime to happen.	75 50.0%	21 14.0%	12 8.3%	20 13.0%	22 14.7%	2.30
Preserving the urban forest will allow future generation to also enjoy them.	2 1.4%	3 1.8%	7 4.7%	18 11.5%	120 80.1%	4.65
As a society, we need to have priorities for managing and protecting our urban forest as a national asset.	1 0.6%	3 1.8%	4 2.7%	22 14.7%	120 80.1%	4.70

It is important to replant the cut down tree.	-	3	-	31	116	4.74
	-	1.8%	-	20.7%	77.5%	
It is possible to obtain revenue from production of timber from urban forest.	78	18	35	12	5	1.96
	52.0%	11.5%	23.8%	8.3%	4.3%	
Urban forest can be developed for economic benefit.	42	8	26	38	36	3.13
	27.8%	5.4%	%	25.3%	%	
It is important to conserve areas of wildlife.	3	7	22	16	102	4.48
	1.8%	4.7%	14.7%	10.6%	68.2%	

CONCLUSION

Urban forest of Bukit Nanas Forest Reserve provides a significant benefit to the residents and visitors through the scenic view and experiences. Preservation the natural environment and urban forest would directly or indirectly the benefits human population that contributing to the quality of urban life. Replanting program that involve the residents and the public will attract awareness would provide a broader benefits, including opportunities for residents to have daily contact with nature, and to enjoy attractive landscapes and recreational activities. The resident that a have higher awareness on the importance and significance of urban forest as green lungs that contribute to their wellbeing are willing to contribute some money for the park maintenance as to ensure the urban park is always in desirable condition. Furthermore, the concern from the residents on urban forest can become an important conservation area for wildlife; will contribute to the bio-diverse of ecosystems as major factors in attracting tourists and as a complement of other urban tourism magnets of the cities.

REFERENCES

Chen, Wendy Y., & Jim, C. Y. 2008. Assessment and Valuation of the Ecosystem Services Provided by Urban Forests Ecology, Planning, and Management of Urban Forests. In M. M. Carreiro, Y. C. Song & J. Wu (Eds.), (pp. 53-83): Springer New York.

Chiesura, Anna. 2004. The role of urban parks for the sustainable city. *Landscape and Urban Planning,* 68(1): 129-138. doi: http://dx.doi.org/10.1016/j.landurbplan.2003.08.003

Costanza, Robert. , d'Arge, Ralph. , de Groot, Rudolf., Farber, Stephen. , Grasso, Monica. , Hannon, Bruce. , van den Belt, Marjan. 1997. The Value of the World's Ecosystem Services and Natural Capital. *NATURE,* 387: 253-260.

Deng, Jinyang, Arano, Kathryn G., Pierskalla, Chad, & McNeel, Joseph. 2010. Linking urban forests and urban tourism: A case of Savannah, Georgia. *Tourism Analysis,* 15(2): 167-181.

Givoni, B. 1991. Impact of planted areas on urban environmental quality: A review. *Atmospheric Environment. Part B. Urban Atmosphere,* 25(3): 289-299. doi: http://dx.doi.org/10.1016/0957-1272(91)90001-U

Lofstrom, I. 1998. *The principles of urban forestry in Finland 19871995.* Doctoral dissertation.

Millward, Andrew A., & Sabir, Senna. 2011. Benefits of a forested urban park: What is the value of Allan Gardens to the city of Toronto, Canada? *Landscape and Urban Planning,* 100(3): 177-188. doi: http://dx.doi.org/10.1016/j.landurbplan.2010.11.013

Tyrväinen, Liisa, & Väänänen, Hannu. 1998. The economic value of urban forest amenities: an application of the contingent valuation method. *Landscape and Urban Planning,* 43(1–3): 105-118. doi: http://dx.doi.org/10.1016/S0169-2046(98)00103-0

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