UNIVERSITI PUTRA MALAYSIA

ECONOMIC EVALUATION AND USER PERSPECTIVE OF URBAN FOREST BENEFITS IN KUALA LUMPUR AND PUTRAJAYA, MALAYSIA

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FRSB 2019 7

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By

IZZA SHAZLEEN ABDUL AZIZ

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

November 2018

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

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November 2016

Chairman : Marek Kozlowski, PhD
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The infill of the residential areas around Kuala Lumpur and Putrajaya have the potential to cause changes in the quantity and quality of urban forest for dwellers need and limited numbers of studies had been done to identify the changes effect on users who reside within these areas. Development projects to fulfill the need of condensing dwellers usually causing loss of amenity values of the urban forest, which can affect the users or surround.

Nowadays, urban dwellers are less attracted to visits and socializing at the urban forest areas provided by the local authority and developers because of the unattractiveness or the similarity of the area to human-made others urban forest. This may cause fewer users in the area, thus might have given a chance to developers or officials to use some part of the area for other more beneficial development.

Urban forests are important in creating recreational opportunities to maintain a high-quality urban environment. Besides being seen as a place for recreational opportunities, it also has wide benefits from economic to environmental aspect. By evaluating the economic value of existing natural urban forest from the user's perspective, the percentage of the urban forest spaces been threatened by the development might be lowered, and authorities or other private sectors will think twice before using the urban forest area for other development and projects.

This study discusses the willingness to pay of users in evaluating urban forest benefits and presents the main results of an empirical study conducted in two study sites, each respectively in Kuala Lumpur and Putrajaya, Malaysia. This study used face to face surveys of 500 urban respondents, 250 respondents for each study sites who are aged 15 and older. Respondents then were asked to answers the questionnaire related to their willingness to pay for the benefits of urban green spaces.

The results suggest that most visitors were willing to pay for the use of well-maintained and planned recreation areas. Furthermore, approximately half of the respondents were prepared to pay for the entrance fees suggested for each study sites. The results can be used to assess the probability of the management of urban forests. Also, the results are useful in determining the value of green space benefits in different land use options.

Abstrak thesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Sarjana Master Sains

PENILAIAN EKONOMI DAN PERSPEKTIF PENGGUNA TERHADAP FAEDAH HUTAN BANDAR DI KUALA LUMPUR DAN PUTRAJAYA, MALAYSIA

Oleh

IZZA SHAZLEEN ABDUL AZIZ

November 2016

Pengerusi : Marek Kozlowski, PhD
Fakulti : Rekabentuk dan Senibina

Penambahan penduduk di kawasan perumahan sekitar Kuala Lumpur dan Putrajaya mempunyai potensi untuk mengubah kuantiti dan kualiti keperluan pengguna hutan bandar dan hanya terdapat sebilangan kajian dijalankan untuk mengenalpasti kesan yang diterima penduduk sekitar kawasan tersebut. Projek pembangunan yang dijalankan bagi memenuhi keperluan penduduk yang semakin tinggi selalunya menyebabkan kehilangan nilai dan kegunaan hutan bandar dan akan memberi kesan kepada pengguna atau persekitaran.

Pada masa sekarang, kebanyakan penduduk bandar kurang tertarik untuk melawat dan menggunakan kawasan hutan bandar yang disediakan oleh pihak berkuasa tempatan dan pihak pemaju kerana keadaan kawasan yang tidak menarik dan rekabentuk yang sama dengan kawasan hutan bandar buatan manusia yang lain. Keadaan ini mungkin akan menyebabkan berkurangnya pengguna di kawasan hutan bandar lantas mungkin memberi peluang kepada pemaju atau pihak berkuasa untuk menggunakan sebahagian kawasan hutan bandar untuk pembangunan yang lebih memberi faedah.

Hutan bandar memainkan peranan penting didalam membentuk peluang untuk berekreasi bagi mengekalkan persekitaran bandar yang berkualiti. Selain daripada menjadi kawasan yang memberi peluang rekreasi, hutan bandar juga mempunyai faedah yang meluas merangkumi aspek ekonomi hingga ke alam sekitar. Dengan menilai faedah ekonomi hutan bandar

melalui perspektif pengguna, peratusan kawasan hutan bandar yang kemungkinan diancam oleh pembangunan dapat dikurangkan. Dengan memberi nilai kawasan hutan bandar, pihak berkuasa dan pemaju akan menilai semula keputusan mereka untuk menggunakan kawasan tersebut bagi pembangunan.

Laporan penyelidikan ini membincangkan mengenai kesediaan pengguna untuk membayar untuk menggunakan faedah yang diperoleh daripada kawasan hutan bandar, dan turut membentangkan keputusan kajian empirikal yang dijalankan di dua tapak kajian yang berbeza, setiap masing-masingnya di Kuala Lumpur dan Putrajaya, Malaysia. Kajian ini menggunakan kaji selidik secara bersemuka pada 500 penduduk bandar yang menggunakan kawasan hutan bandar, seramai 250 responden yang berumur 15 dan keatas menjawap kaji selidik bagi setiap tapak kajian. Responden kemudian diminta untuk menjawap soal selidik yang berkaitan dengan kesediaan mereka untuk membayar apabila menggunakan kawasan hutan bandar.

Keputusan kajian menunjukkan bahawa kebanyakan pelawat sanggup membayar bagi penggunaan kawasan rekreasi yang diselenggarakan dengan baik dan terancang. Hampir separuh daripada responden sanggup membayar untuk bayaran masuk yang disyorkan bagi setiap kawasan kajian. Keputusan boleh digunakan untuk menilai kebarangkalian pengurusan hutan bandar. Di samping itu, keputusan juga berguna dalam menilai nilai faedah kawasan hijau dalam pilihan penggunaan tanah yang berbeza.

ACKNOWLEDGEMENTS

In the name of Allah s.w.t., I dedicate this work to:

For those who love and appreciate the hard work in creating better living environment. And those who have put interest in this study and are going to use its findings.

Those who hold a special place in my heart,
Beloved mother, *Hasimah Ab Kadir*,
brothers and sisters that bond by blood
and those who were bond by heart.

In ever loving memories,
Beloved father, *Almarhum Abdul Aziz Mohamed*
And
Mak Tok, *Almarhum Hjh Zainab Abdul Hamid.*

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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LIST OF ABBREVIATIONS

CVM	Contingent Valuation Method
WTP	Willingness to Pay
USD$	United States of America Dollar
RM	Ringgit Malaysia
W.P Putrajaya	Wilayah Persekutuan Putrajaya
W.P Kuala Lumpur	Wilayah Persekutuan Kuala Lumpur
BNFR	Bukit Nanas Forest Reserve
PBG	Putrajaya Botanical Garden
SPSS	Statistical Package for Social Science

CHAPTER 1

INTRODUCTION

A proper and functioning of any city and the wellbeing of inhabitants is based on the provision of its urban forests.

The urban forest term that are agreed by ecologist, economist, researchers and planners are any directly or indirectly known as everything public or privately owned green area inside a city area that are covered with vegetation (Tuzin *et. al.,* 2002). Spaces or zones with moderately high numbers of individuals and non-natural surfaces are the basic connotes of the term “urban”. Nowak et al., (2001) include from all everything openly or privately owned trees inside a city area, which includes planted trees alongside streets and in courtyards, as well as stands of explored part of forest area are considered as urban forest and in sustaining urban development and urban ecology they hold significant roles. Any wooded green areas located close or within the town limits (2 to 6 kilometre) are also considered as urban forest (Nowak *et. al*, 2001).

Any established area with vegetation and open spaces that available for any activities regarding sociology or psychology health of the residents are considered urban forest. Urban forests usually are in moderate size and located inside residency area or within reach of the residents of the housing area and provide aesthetic as well as recreational benefits for the dwellers.

Many developing countries are more focusing on economic and physical development rather than the environment. Less maintained and being concerned by the authority not only effecting the surrounding environment but also effecting the social and economic costs of the dwellers everyday life as the growing of traffic congestion and urban heat, especially in the major town and cities. Many previous studies are focusing on the air and water quality economic value of the urban areas. However, there only a few numbers of studies that been done on valuing the urban forest.

To evaluate the value of an urban forest, visual evaluations are needed. The problem of visual landscape evaluation is that it cannot be solved by considering only the environment without taking the society into account (Kamicaityte, J. *et. al.,* 2004). Kristensen *et. al.,* (2001) stated that the feasibility of landscape policies will also depend on the support from the surrounding public. This is because, the evaluation on the users and visitors are associated with preference and satisfaction through the experience at

the specific place and finally it will develop the willingness to pay for the area.

Rapid and expanding in population are happening worldwide in urban areas. Referring to Figure 1, urban population in developing countries tend to growth in a great number, by obtaining 3.82% yearly in Southeast Asia alone (UN-HABITAT 2006). Due to the overwhelming city development, more urban forest area is destructed and degraded as the cities around it became bigger and denser. (Turner *et. al.,* 2004; Faul 2008).

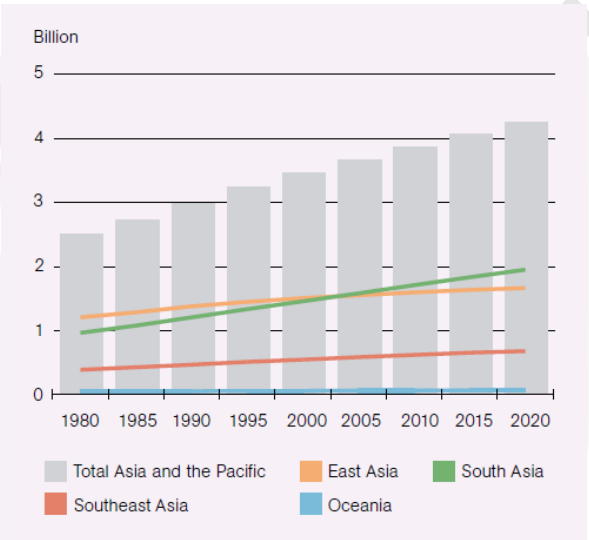


Figure 1: Population of Asia and the Pacific
(Source: UN, 2008)

In the past decades, demand for a much better living quality, education, wages, housing, public transportation and health care have experienced rapid increasing in demand due to the Asia-Pacific urbanization and increasing of populations (UNPD 2008). As a country developed, most of dwellers from the rural areas start to migrant to the bigger cities and this are causing more concentrated surrounding and more development are happenings, thus it also causes of losing of urban forest around the cities, though that urbanization is beneficial toward the country (Jim, 2004). Table 1 shows the changes of forest area from 1990 to 2005 of world and the sub regions. South East Asia forest area has been decreased over the years from 245605 ha in 1990 to 203887 ha in 2005. The role of users and dwellers of surrounding urban forest or city parks are more recognized nowadays although at first thought it appear to be small (Wolf 2005; Davison & Ridder 2006).

Table 1: Forest Area Extent and Changes 1990-2005

Sub-region	Area (1000 ha)			Annual Change (1000 ha)		Annual Change Rate (%)	
	1990	2000	2005	1990-2000	2000-2005	1990-2000	2000-2005
East Asia	208155	225633	244862	1751	3840	0.81	1.65
Oceania	212514	208034	206254	-448	-356	-0.21	-0.17
South Asia	77551	79678	79239	213	-88	0.27	-0.11
S.E Asia	245605	217702	203887	-2790	-2763	-1.20	-1.30
Total	743825	731077	734243	-1275	633	-0.17	0.09
World	4077291	3988610	3952025	-8868	-7317	-0.22	-0.18

(Source: FAO, 2006)

The zones that available between structures of building in the town are usually placed in two different groups, either the grey spaces or green spaces. This is a basic understanding for urban planners. Hard surfaces that cover the city like stone, concrete or asphalt, walking path and car parks are called “grey spaces”. Meanwhile, part of the city that were consists primarily by organic and absorbent surfaces such as soil, grass, shrubs and trees are defined as green spaces (Dunnett *et al.,* 2002), from parks, shades area for seating, trees by the road and other green areas build for recreational activities or naturally are considered as urban forest. It includes those openly or privately managed trees, the term is still used depends on the criteria.

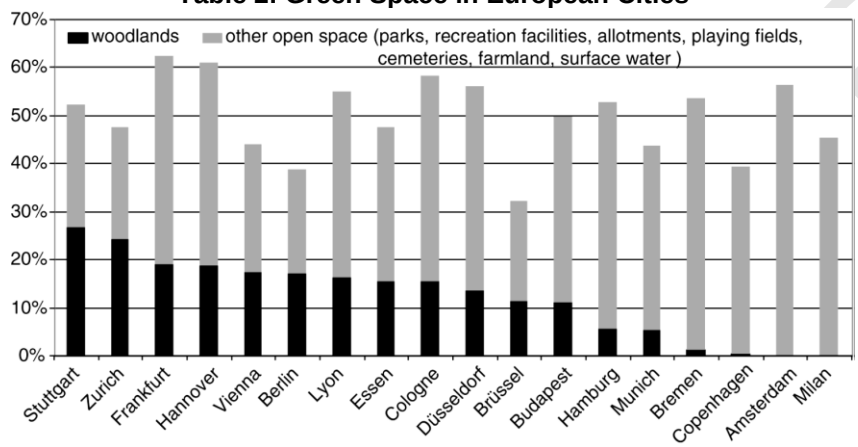
Figure 2: South East Asia Forest Resources
(Source: FAO, 2009)

Figure 2 shows the land covers of South East Asia region, although Malaysia seems to be mostly covered by forest and other wooded land, it still facing the decreasing of green areas percentage over the years. Malaysia endowed as one of the twelfth richest biodiversity in the world (Malaysia Nature Society, 2006). However, due to the development phase which the country currently in, floras and faunas of Malaysia are facing serious threats and have already depleting. Tropical virgin forest in Malaysia mainly recognized as income source, important component of timber and forest products, maintaining pollution rate, home for aboriginal people and eco-tourism or recreational activities provider.

In 1989, the total area of natural forests in Malaysia was estimated 20,890,000 hectares, which covers 63.6% of the total land area as been stated by Chuen *et al.,* (2010). From 1983 to 2003, reductions of approximately 4.9 million hectare of forest cover in Malaysia or an average of 250,000 hectare of forest being lost annually (UN-REDD, 2012). As at the end of 2008, Selangor have a total of 241,568.3 ha of permanent reserve forest which form 30.5% of total state area (Selangor Forestry Department, 2009). Most of developed cities have at least 16 square metres of green space per person, for example city of Vancouver is having 22 square metres of green space per person. In comparison to developed cities, Kuala Lumpur are falls far behind with only 12 square metres per person. Kuala Lumpur's percentage not only far low from Vancouver but it also below the WHO

standards of at least 16 square metres per person. However, with the current rate of population growth and economic development of Malaysia, the amount of green space per person will decreased to 8 square metres per person by 2020 (Ministry of Federal Territory).

Table 2: Green Space in European Cities



(Source: Pauliet S., et al., 2005)

Department of Statistic Malaysia has stated in their Population Distribution and Basic Demographic Characteristic Report in 2010 that Selangor was the most populous state with 5.46 million, followed by Johor and Sabah. While the least populated states were W. P. Putrajaya (72,413) and W.P. Labuan. Despite the fact that Selangor have higher population rate, it placed third in Malaysia's state level of urbanisation after W.P. Putrajaya and W.P. Kuala Lumpur which both have 100% urbanisation rate (Department of Statistic, 2010). Due to the increasing of population and development, the deforestation is un-avoidable.

This research aims to evaluate the value of urban forests. It argues that as a result of rapid urbanization and the public needs, established urban forests are considered less attractive and there exists the willingness to pay for a better facility. It will study the rate for two types of urban forests in urban area: natural and man-made. It will also explore the green space planning and management that might affect the visitor's decision in their willingness to pay.

Therefore, this research approaches the issue by employing cognitive and economic approaches. The significance of this study is that the study on comparing willingness to pay on two types of urban forest could offers an understanding on people preferences and improve planning and

management policies based on the visitor's evaluation. Within this framework, the research focuses on visitor's evaluation on planning and management of the selected sites, in examining the cognitive aspect of preferred types of urban forest and its linkage with economic aspect. This research seeks to provide a better understanding of visitor's responses to different kinds of urban forest and to understand the effectiveness of the current urban forest areas planning and management.

1.1 Background

From all the population of African and Asian, the number that would live in urban area are 50% by 2025 as estimated by the World Resources Institute (2001), urbanization is a worldwide phenomenon. With an urbanization level of 33%, although it is well known that high percentage of Asia's population are majorly from China, but only more than half (63%) population of Western Asia lives in urban residency (FAO, 2011). Powered by the changes of lifestyle of rural areas, the increasing number of birth, the decreasing numbers of death and rapid migration to urban areas, in two or three decades most of rural areas in developing countries had turn into urban cities. This pattern had been increasing fast and often doubling in size every fifteen years (Gilbert and Gugler, 1992).

For example, Kuala Lumpur, the capital of Malaysia, had transformed from a small residency area in 1870s into a developed town and afterward into the capital of Malaysia. From there it started to developed into a mega city and accepting all the changes of development cities with rapid, mostly unintentional physical growth. Kuala Lumpurs' population are increasing from 977,102 in 1980 to 1,887,674 in 2007 (UNPD Malaysia 2008). However, the number are expected to projected towards nearly 2.1 million by 2020 (Kuala Lumpur City Plan, 2009) has been mentioned. However, the number probably not including the metropolitan area which most likely reach up to 6.5 million residents by year 2020. Urbanization are beneficial toward the country, this means the urban forests often face considerable development pressure by the growing populations concentrated in cities (Jim, 2004). Less contact of city dwellers and natural environment might occur when loss of urban forest are increasing (Peschardt *et al.,* 2012), which can cause the decreasing of health and quality of city dwellers life.

By covering 63.6 % of the total land area, total forested area in Malaysia is 20,890,000 hectares. However, in the recent years, due to multiple human activities including the expansion of urban areas, the total area had been downsizing annually with 0.7% rate from 2000 to 2005 (Chuen *et al.,* 2010). If left unchecked, the number of loss forested area may cause the loss of one of the world oldest natural tropical forest. Exaggerated by many urbanization activities, the number of reforestation projects might not able

to overcome the rapidness thus the deforestation rate will be increasing. The pressures that urban population centres area are increasing each year because of this issue.

Fortunately, due to recreation needs and growing environmental awareness in the recent years, there is an increasing demand for urban forests and amenity spaces in urban centres. Nature experiences also helps in strengthen the environmental awareness and encourage environmentally responsible behaviour to the users or visitors as been stated by Brennan & Dodd (2009) and Thompson *et al.,* (2008).

As stated above, trees in developed cities present vast variety of belief and benefits. Properly placed trees plus design can help in reducing electricity cost of a building (Akbari *et al.,* 1986; Akbari, 2002) as the urban forest provides shading to buildings from direct sunlight. It also works as a location provider for outdoor recreation (Jim *et al.*, 2006), providing a warm feeling, stress free environment and aesthetical beauty (Tyrväinen *et al.,* 2003), enhancing real estate values (Tyrväinen & Miettinen, 2000) and potentially reducing crime (Kuo & Sullivan, 2001). Trees that planted in the urban landscape areas helps in improve air and water quality by filtered, trapped and processed the pollutants (Lovett *et al.,* 2000; Fowler, 2002). Miller (1988) had categorize two types of climatic change that effecting human quality of life, direct effects on user's comfort and effect on users' economic aspects such as building heating.

Besides reducing the budget, it also works as air pollution control, noise reduction, improvement of microclimatological conditions and provision of recreational opportunities and have a physical and psychological effect on others aspect of human health. (Tyrväinen & Miettinen, 2000). Urban residency with landscaped area and greenery view giving better impact on preference and can be a positive influencer for dwellers psychological wellbeing in comparison to areas with lack of vegetation and views with greenery (Ulrich, 1990). These trees also remove carbon dioxide (CO2) from the air when developing its foods while the roots helps in neutralize and revitalize polluted soil (Nowak & Crane, 2002).

By stand between the rainfall and soil surface, trees canopy helps straining the harsh rainfall into smaller particle before its fall and infiltrates the soil, these will be lessening the risk of soil runoff into pipes and sewer (Bolund & Hunhammar, 1999; Nowak & Dwyer, 2007). These valuable services provide by trees in the urban landscape will help decreases the cases of flooding and sewage overflow in urban areas that usually faced in heavy rains season.

The urban forest also helps in protecting the coastal cities from natural catastrophic damage with their roots used as stream banks stabilizer and help to prevent erosions. This had been proved with the lessened of storm surge in coastal regions that has coastal forests, peat swamp and mangrove swamp (Gedan *et al.,* 2011; Loder *et al.,* 2009). On the other hand, trees leaves and branches help in reducing the amount of sunlight penetration towards the area under their canopy shades. The percentage of sunlight that able to penetrate are varies on species.

Specifically, urban forest is important for city dweller's being. Chang and Chen (2005) had approved that number of times visited and spent in natural surrounding and settings are linked to reducing stress, (Kaplan, 2001) and to increase and positively effecting physical health (Peters, 2010). The stress of living in urban cities that were faced by mostly urban dwellers are the targeted users for this area as they will need a space or area to emotionally and physically relax after the long day (Howley, 2009). Brennan & Dodd (2009) and Thompson et al., (2008) stated that the urban forest can also be used as an instrument for strengthening the environmental awareness thus giving optimistic influences on personal well-being and lifestyle (DeGraaf & Jordan, 2003). The under estimation of these benefits of urban forest will slow down the distribution efficiency of resources in order to attain sustainable living in urban areas.

Urban forests in cities are important in order to secure a healthy leaving and productive dwellers. As urbanization taking over open spaces in the cities, more and more urban forests turned into industrial and settlement areas. To overcome this shortage, the dwellers often seek refuge in the urban forests area that has already provided by the local authorities. Due to development pressure, the economic benefit of developing urban forest may surpass the intangible social benefit the forest can offer. This research focuses on the park visitor willingness to pay to visit urban forests as mean to put economic value on urban forests. Fees collected from visitors not only helps in funding activities and as a form of revenue but also as part of the management and restoration funding by the management team (Manning, 2011).

In assessing the fees impact on potential of charges and fees on users, two main aspects of human behavior need to be explored. First is on the willingness to pay, which is a personal intention of the users toward the fees suggested. Secondly is on the public attitudes, involving a social psychological response of the users to fees and usually are more to evaluation of situation, issues, likeness and sense of belonging tendency (Barro *et al.,* 1996).

In assessing the human behavior of willingness to pay on economics field, contingent valuation method is one of most common used method (Loomis, 2004). Other valuation techniques used for monetary benefit assessment including the measuring the non-market valuation preferences for green landscapes, hedonic pricing method and employing revealed preference methods which including the travel cost method. Contingent valuation method is stated preference (Bowman *et al*. 2009; Caula *et al.* 2009) and choice modelling (Whitten and Bennett 2001) also can be elicited for a hypothetical green spaces basis. The contingent valuation method is a widely accepted and well-established method, despite of some known response biases, since it offers certain advantages, for example, the ability to capture "non-use" values (Pearce & Turner, 1990; Diamond & Hausman, 1993; Shavell, 1993; Coller & Harrison, 1995; Bateman & Willis, 1996).

Hypothetically, the CVM measures the total value of urban forest benefits. By established a hypothetical loss of public goods or service that needs the minimum compensation for the particular benefit, information regarding public's evaluations and their willingness to pay for the compensation are collected by survey (Carson, 1991; Mitchell and Carson, 1995). Despite the fact that it is widely use in evaluating the non-market value, it also bare problems. The problems of this type of survey had been discussed by other researchers before (e.g. Carson, 1991; Mitchell and Carson, 1993; Arrow *et al*., 1993). The highest number of payment that the user is willing to pay from their income to avoid something undesirable happens on the goods or service that they related to also define the willingness to pay. The price of the product, goods or service is an agreeable price between sellers' willingness to accept and the buyers' willingness to pay for it.

However, in social psychology field of study, the willingness is a notion to state a behavior that considered as an attitude partially influenced by behavioral intention (Ajzen & Driver, 1992). To predict the behaviors of users on the management systems it is important to assess their attitudes because it helps in prediction of future behaviors, their level of acceptance and potential impact on the fees policy. Respondents' personal experiences on the site and their acceptance of the benefits they gained are basically generate the sense of willingness to pay and the more benefits they gained the higher amount of payment are.

Before answering their willingness to pay, respondents are explained and reminded of the vast benefits of urban forest they can consider before making their decision on willingness to pay in a comprehensive survey of landscape design (Walsh *et al.,* 1984). In attention to trigger the behavioural intention to pay, or appropriately defined as the capability of estimating the economic models of willingness to and may improve the descriptive and predictive on measuring attitude (Ajzen & Driver, 1992; Pouta & Rekola,

2001; Spash *et al.,* 2009), even if only with small margin (Bernath & Roschewitz, 2008).

Enhancing the model behavior of willingness to pay for specific environmental products and services, integration of attitude theory, contingent valuation and having the advantage on both economic and socio-psychology decisions model are (Barro *et al.,* 1996, Ajzen & Driver, 1992, Meyerhoff, 2006; Bernath & Roschewitz, 2008; Spash *et al.*, 2009, McFadden, 2001).

However, most of the studies on willingness to pay are on one site of study or multiple sites but with same type of urban forest. Therefore, this study is aimed on evaluate the willingness to pay on two different type of urban forest and compare to which the type of urban forest is preferred by the users or visitors as shown in case study.

1.2 Problem Statement

According to Malaysia Department of Statistic (2011), W.P. Putrajaya recorded the second highest migration rate at 3.8 per cent for the period 2010–2011. Majority of the migrants in W.P. Putrajaya were inter-state migrants with 3.5 per cent and international migrants at 0.3 per cent while W.P. Kuala Lumpur placed 15th with more than half of the migration are inters-state migrants. The infill of the residential areas around Kuala Lumpur and Putrajaya have the potential to cause changes in the quantity and quality of urban forest for dwellers need and limited numbers of studies had been done to identify the changes effect on users who reside within these areas. The sustainable development in urban environment has been seen as a condensing of the town structure such as the infill of residential area while creating a positive image of a town with a better environmental quality has been seen as the key factors nowadays.

In developing cities like Kuala Lumpur and Putrajaya, urban forests are important in creating recreational opportunities in order to maintain a high quality urban environment. Besides being seen as a place for recreational opportunities, it also works as part of shading and cooling system and decreasing the urban heat island effects (Takano et al. 2002; Thaiutsa et al. 2008). Urban development projects usually causing loss of amenity values of urban forest, which can affect the users or surrounding. Nowadays, urban dwellers are less attracted to visits and socializing at the urban forest areas provided by the local authority and developers because of the unattractiveness of the area. This may cause less users in the area, thus might have given a chance to developers or authorities to use some part of the area for other more beneficial development.

By evaluating the economic value of existing natural urban forest through the user's perspective, the percentage of the urban forest spaces been threatened by the development might be lowered and authorities or other private sector will think twice before use the urban forest area for other development and projects. Maintaining established urban forest are better than planning and planting new green areas as the original species of flora and fauna are kept and the existing ecosystem are in normal condition without the introduction of alienated species.

A proper planning, design, management, and legislation are important in maintained and developed a functional urban green spaces. To establish a better plan and management design, users and visitors need and opinion are vitals. Thus, better understandings are needed in order to help strengthen the planning and management of selected urban forest.

1.3 Aim

This research aimed to ascertain the users' opinion on the planning, management and economic value of urban forest in Federal Territory of Kuala Lumpur and Putrajaya.

1.4 Research Question and Objectives

The main research question is: Is there a relationship between types of urban forest/ green area, user's satisfactory and economic values for selected study sites?

To answer this question, the following sub-questions are posed:

(i) What are users preferred types of urban forest?
(ii) Are there differences in terms of economic benefits in different types of urban forest?

The objectives of this research were to:

1. To evaluate users' opinion on the planning and management of Bukit Nanas Forest Reserves and Putrajaya Botanical Garden.
2. To evaluate and compare the economic benefits of Bukit Nanas Forest Reserves and Putrajaya Botanical Garden in terms of Willingness to Pay.

1.5 Methodology

The methodology of this research is based upon the formulation of the main aim, main research question and two objectives. In order to answer the main research question, a combination of qualitative and quantitative research methods is used in this research. The qualitative methods will include literature reviews, field survey and questionnaire surveys. The quantitative methods will include Contingent Valuation.

For the qualitatively-oriented data such as literature reviews, this study has majorly based on sources such as professional, governmental, academic, as well as journalistic. Materials from individual homepages, personal companies or blogs also included when there are deemed of sufficient information. Meanwhile, for the quantitatively-oriented survey, this study used face to face surveys of 500 urban respondents, 250 respondents for each study sites who are aged 15 and older. These respondents where then asked to answers the questionnaire which in dual language (English and Bahasa Malaysia) and with the help of surveyor. The survey was conducted with the supervision of a surveyor in order to give assistance if the respondents facing any difficulties in answering the survey.

Total of 250 respondents on both study sites had successfully answered the questionnaires, which consisted of three different sections of Likert-like scale for satisfaction on study sites and willingness to pay. When designing the survey questions, extra attention given in order to make sure the survey is interesting even for first-timer visitor and light-users of urban forests. According to Kaplan and Kaplan (1989), public respondents are people who do not have expertise in a given field. Therefore, the respondents of this study are considered as public respondents.

1.5.1 Methods and Techniques

Table 3: Methods/Techniques Used

Objectives	Methods/ Techniques	Data Source	Expected Outcome

To evaluate users' opinion on the planning and management of Bukit Nanas Forest Reserves and Putrajaya Botanical Garden.	• Case studies • Questionn-aire surveys • Structured interviews • Qualitative and quantitative analysis • Contingent Valuation Method	Primary data sources from questionnaires and structured interviews	Information on user's satisfaction in Putrajaya Botanical garden in compare to Bukit Nanas Forest Reserve.
To evaluate and compare the economic benefits of Bukit Nanas Forest Reserves and Putrajaya Botanical Garden in terms of Willingness to Pay.	• Case studies • Questionn-aire surveys • Structured interviews • Qualitative and quantitative analysis	Primary data sources from questionnaires and structured interviews Secondary data sources from journals and previous studies on Willingness to Pay	Information on users' tendency to pay for the benefits they gained at Bukit Nanas Forest Reserves and Putrajaya Botanical Garden.

1.5.2 Case Study Areas

This study uses case study. It refers to collection and presentation of information of a participant group. In this group usually include the subjects. This allows researchers to discover the relationship between the targeted groups, simple through complex interference, organization or communities (Yin, 2003) to support the subsequent and deconstruction of various phenomena. An explanatory, exploratory, or descriptive case study categories as describe by Yin (2003). The data from the case study research are from multiple data sources which in same time also enhance the data credibility itself (Yin, 2003).

Figure 3: Study Sites Location (Bukit Nanas, Kuala Lumpur and Botanical Park, Putrajaya)
(Source: Google)

There are three areas of forest reserves in Kuala Lumpur that bare potentials of became one of ecotourism attractions in the country. They are Bukit Nanas, Sungai Besi and Sungai Seputeh Forest Reserves. However, until now, only Bukit Nanas has been developed for recreational purposes by Forestry Department. Bukit Nanas Forest Reserve (BNFR) is chosen as one of the study sites, because of its natural matured forest standing and also the possible benefits it offers to Kuala Lumpur citizens and visitors. This unique green belts lives around the base of one of Malaysia's tallest buildings, the 421-metre high Kuala Lumpur Tower.

Bukit Nanas Forest Reserve was established as a recreational forest on 29 July 1970, but it was gazetted for public use since as long as 1906. These 5 hectares protected virgin tropical forest is the oldest reserve of urban forest in Malaysia and was also gazetted as a Wildlife Reserve and Bird Sanctuary and in 1950. It is the only virgin tropical rainforest left in the heart of a city, so it is a great benefit to the surround dwellers and is home to a rich range of flora and fauna.

According to Owen (1992), an ecosystem with rich biodiversity often found in older gardens and parks. Urban and local originated plants and animals often making these places as their main habitats. Besides that, green spaces help in creating and improve wildlife ecosystems and can act as "reservoirs" for threatened species (Howenstine 1993). Brennan & Dodd (2009) and Thompson et al., (2008) stated that the urban forest can also be

used as an instrument for strengthening the environmental awareness and encourage environmentally responsible behaviour to the users or visitors.

The second choice for site study is the Putrajaya Botanical Garden. It is located at the north of Precinct 1, Federal District of Putrajaya. Covering an area over 92 hectares, it is known as the biggest botanical garden in Malaysia and serves as human made recreational area for the residents of the surrounding areas. The park is established on a formerly agricultural land and home to Asia Pacific, Africa and South American plants. Divided into four main zones which are the Explorer's Trail, Palm Hill, Floral Gardens and Lakeside, it main purposes is to educate and helping users enjoying their recreational activities and giving a different perspective on outdoor activities.

In building a constant support of public for urban forest related programs, the most critical step is determining the importance and attachments of surrounding publics and dwellers to the urban forest and public's knowledge and perception of it. Therefore, predicting and interpreting users' willingness for charges and stated payment method on green areas based on the data from contingent valuation method are important. The environmental valuation estimation could help in justifying the rehabilitation budgets and identifying decisions through cost-benefit analyses. This will help to provide a tool in the enforcement of appropriate land-use policy (Pearce & Turner, 1990; Kula, 1994).

1.6 Limitations of Study

This study is limited only to Bukit Nanas Forest Reserves, Kuala Lumpur and Putrajaya Botanical Garden, Putrajaya, Malaysia. This study focuses on users and visitor's willingness to pay on established urban forest based on the sites attractions, design and management. This sites are chosen by the different of it types of urban forest, location and possibility of the type of visitors.

1.7 Significance of Study

Finding the right parameter to identify users' willingness to pay can help in evaluate the monetary value of our current environment assets, which are the urban forests. Thus, from this study, users' opinion on the design and management of the urban forest will be evaluated. Secondly, this study, will evaluate the economic benefits for urban forest in Kuala Lumpur and Putrajaya. This study will contribute to the development of more effective design and management of urban forest and provide economic value on the future of our urban forests.

1.8 Organization of Chapters

This dissertation is divided into 5 chapters, which are organized as follows:

Chapter 1 provides an introduction to study, which includes background of study, problem statement, research questions, Aims and limitation of study.

Chapter 2 provides literature reviews on urban forest, urban forest benefits, economic evaluation and economic evaluation on non-marketed goods.

Chapter 3 discusses the research methodology. It explains and justifies the selection of the research methods and techniques for data collection and analysis.

Chapter 4 discusses the results obtained from the study, including satisfaction of area and willingness to pay. Further discussion on the relationship between satisfaction and willingness to pay also presented in this chapter.

Chapter 5 provides the conclusion and recommendations for this dissertation regarding to the consumer's satisfactory level and economic benefits of the selected study sites.

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