APPLICATION OF THE TRAVEL COST METHOD TO URBAN FORESTS IN JOHOR BAHRU

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To my beloved father, mother and sister

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ABSTRACT

Urban forest features so many values. Forest and tree resources have so many benefits and values from a wide range of socio-cultural, economics and environmental values. Travel Cost Method (TCM) was developed to estimate the economic value of environmental goods such as urban forest areas. In this study, the economic value of urban forest has been estimated by using TCM with the case studies of MPJBT Urban Forest and MBJB Urban Forest. 100 sets of questionnaire have been distributed to each site. The number of annual visits made by visitors was used as dependent variable, while travel expenditure to the urban forest, total distance (two-way) from the residential area to the urban forest, and age of the visitor were selected as the independent variables in the demand model. A linear form was used to estimate the consumer surplus of the urban forest visitors. The linear regression equation gives the demand function for the visitor to the site, and the area below demand curve gives the consumer surplus. The results showed that consumer surplus per trip are RM 41.75 for the visitor of MPJBT Urban Forest and RM 30.34 for the visitor of MBJB Urban Forest. These findings would provide some useful information that might be needed for those involved in planning and management for the development of urban forest sites especially in Johor Bahru for the benefits of local communities.

ABSTRAK

Hutan Bandar menawarkan pelbagai ciri yang bernilai. Hutan dan sumber pokok mempunyai pelbagai keistimewaan dan nilai daripada pelbagai nilai sosio-budaya, ekonomi dan persekitaran. Kaedah Kos Perjalanan (TCM) telah dibangunkan untuk menganggar nilai ekonomi sesuatu persekitaran seperti kawasan hutan bandar. Di dalam kajian ini, penggunaan nilai hutan bandar telah dianggarkan menggunakan TCM dengan kajian kes di Hutan Bandar MPJBT dan Hutan Bandar MBJB. 100 helai borang soal selidik telah diedarkan pada setiap kawasan. Jumlah kunjungan tahunan yang telah dibuat oleh pengunjung digunakan sebagai pembolehubah bersandar, manakala perbelanjaan perjalanan ke hutan bandar, jumlah jarak (dua hala) daripada kawasan perumahan ke hutan bandar, dan umur pengunjung telah dipilih sebagai pemboleh ubah tidak bersandar pada model permintaan. Bentuk linear telah gunakan untuk menganggar lebihan pengguna daripada pengunjung hutan bandar. Persamaan regresi linear memberikan fungsi permintaan kepada pengunjung ke kawasan itu, dan kawasan yang berada di bawah lengkok permintaan memberikan lebihan pengguna. Keputusan kajian menunjukkan bahawa lebihan pengguna pada satu lawatan untuk pengunjung Hutan Bandar MPJBT ialah RM 41.75 dan RM 30.34 untuk pengunjung Hutan Bandar MBJB. Penemuan ini akan memberikan beberapa maklumat berguna yang mungkin diperlukan bagi mereka yang terlibat di dalam perancangan dan pengurusan untuk pembangunan kawasan hutan Bandar terutamanya di Johor Bahru untuk kepentingan masyarakat setempat.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Nowadays, urbanisation process brings with it a lot of challenges and problems that we have to deal with. From the demand of land increases, and the energy, resource, water, to the waste disposal needs of urban populations need to be met. So, one of the main challenges of our time is to provide good living conditions to urban populations. Challenges related to urbanisation are very significant.

Policymakers are facing tremendous pressures to develop city management strategies that strive for sustainable cities where all inhabitants can enjoy at least a fair quality of life and a reasonable healthy environment. Urban green spaces with trees as a major component play an important role in order to make the city liveable, sustainable and healthy. The contribution of forests, trees and other green urban areas to the quality of urban life and the environment can be significant.

The term urban forest attempts to provide a new more relevant description that reflects the more natural, lower maintenance less tailored or cared for, self sustaining vegetation and treed areas that are characteristic of the forest (Justice, 1986). According to Miller (1997), an urban forest may be defined as the sum of all woody and associated vegetation in and around dense human settlements, ranging from small communities in rural settings to metropolitan regions.

In Malaysia, Kuala Lumpur being the first city that adopted the Urban Forest Landscape concept because it is becoming increasingly more expensive to develop, manages and maintains the traditional gardens and landscape. According to Justice, (1986), the urban forest concept for Kuala Lumpur is one which can provide all the elements of a quality outdoor environment; cool, colourful, fragrant, fresh, clean and green, visually attractive and enhancing the urban environment that makes urban living a pleasant and enjoyable way of life. There is already a natural regenerating ecology that occurs in Kuala Lumpur that is well on its way to meeting this urban forest concept.

An urban forest is a forest or a collection of trees that grow within a city, town or suburb. In a wider sense it may include any kind of woody plant vegetation growing in and around human settlements. Urban forest and trees play a very important role in keeping our towns and cities comfortable environment to live. As we know, they provide high-quality and working environments, recreation opportunities with nearby settlements and also cleaner air and water. As cities struggle to comply with air quality standards, the ways that trees can help to clean the air should not be overlooked. With effective planning and management, urban trees and forests will provide a wide range of important benefits to urbanites (Dwyer *et al.*, 1992).

In recent years, the urbanisation of many cities advance the need for green space in the community to serve people in multiple objectives of environmental protection, recreation, and to meet people's ability to incorporate physical activity into their daily routines (Iamtrakul *et al.*, 2005). Urban forests are becoming significant and increasingly valuable component of the urban environment nowadays. Unfortunately,

because of the rapid development and urbanisation today, urban forest resources now are declining day by day in many cities especially in the developing countries. Thus, there must be some efforts to protect and preserve trees for the benefits today and in the future.

According to Tyrväinen and Miettinen (2000), the cost of supplying urban forests can be calculated in a relatively straightforward way, but the benefits are more difficult to estimate. Most urban forest benefits do no have a market price. Many economists and environmentalists have debated the issue of placing monetary values on environmental goods. The most popular classification for the methods of the pricing and valuation of environmental goods and services include Demand Curve approaches and Non-Demand Curve approaches (pricing through market priced goods) (Jabarin and Damhoureyeh, 2006).

Several methods of valuing environmental goods and services have evolved in recent years (Shammin, 1999). According to Ortaçeşme *et al.* (2002), some methods were developed for estimating the economic value of non-market environmental goods such as parks and recreation areas in the last 40 years. Travel Cost Method (TCM) and Contingent Valuation Method (CVM) are the most widely used methodologies in the determination of recreational use value of forests around the world (Pak and Türker, 2006). TCM is the common indirect method used to estimate the recreational value of natural areas. The basic premise of the TCM is that the time and travel cost expenses which users incur to visit a site represent the "price" or access to the particular site.

1.2 Issues

Today, forest resources are declining rapidly and the resulting of these are only fraction of what they could be. No one can deny about the importance and benefits of forest resources especially open green spaces in the major cities such as mitigate many impacts of urban development. Thus, local communities now realized the benefits of urban forest and significantly becoming valuable component of the environment especially in many cities around Malaysia.

Urban forest can be classified as one of environmental assets. Many of the environmental assets are also public goods. No one can put or assume a certain amount of value onto those benefits that they can get from urban forest. The recreational use of urban forest is one kind of benefit obtained from urban forest. Thus, the economic value of these benefits can be estimated by using a preferable method which is TCM.

In the district of Johor Bahru, there are two urban forests which are located in Johor Bahru and near Skudai. These sites do not require any entry fees or charges except for a certain activities and have received visitors all year around to do their recreational activities there. So, it is very difficult for us or local authorities to evaluate the economic value of urban forests in Johor Bahru.

This study assesses the economic value of urban forests that visitors derived by estimating a TCM demand function. TCM is based on revealed preferences and real markets of urban forests are observed. By estimating the demand curve for the visitors visiting the urban forests in Johor Bahru, it is also possible to estimate the consumer surplus of the visitors.

According to Klenosky *et al.* (2007), the mix of natural features and manmade elements in the urban environment and areas presents unique challenge for the planners, developers and managers. Even though some elements of the urban landscape in the city

such as forested areas and parks may attract or encourage visitation, others such as industrial activities, odours, and noises may hide the positive elements, thus repelling visitation. This study also will identify what are the factors affecting the choice of site by visitors to urban forests. Besides that, this study identifies the factors that affecting annual visits to urban forests by the visitors because there are many factors affect the number of visits to a site

1.3 Research Questions

Based on the current issues above, a study or research must be conducted to answer those issues and also research questions as below:

(i) How much visitors are spending as their travel expenditure for visiting urban forest to do their recreational activities?

(ii) What are the attractions or factors for the visitors make repeated visits to do their recreational activities in urban forest?

(iii) What is the economic value for the recreational services and activities in the urban forest?

1.4 Objectives of the Study

There are three main objectives in this study that will be conducted based on the research questions above:

(i) To assess the economic value of urban forest.

(ii) To determine the travel expenditure of visitors for visiting urban forest.

(iii) To identify the factors affecting the numbers of annual visits of visitors to urban forest.

1.5 Significance of the Study

As a conclusion, the results of this study will find out the monetary value of urban forest based on the assumption of TCM which is reflected in how much visitors are spending just to get there and do their recreational activities.

There are very few of public parks and urban forests used for recreation purposes in Johor Bahru. The economic value and benefits provided from these areas need to be known for their future protection, planning and management

1.6 Chapter Outline

There are five chapters will be included in this study to discuss stages by stages in each of the research progress. In Chapter 1, the researcher focuses to the research questions, the main objectives to be achieved, and the significance of this study. Those elements are very important in determining the direction and progress of this study.

Chapter 2 describes the literature review about definition of recreation and leisure, the benefits and costs of the urban forest, factors affecting visitation to urban forest and the method of valuing the environment which is Travel Cost Method (TCM).

Chapter 3 explains more detail about the methodology of this study. This will be included background of the study, case study areas which are MPJBT Urban Forest and MBJB Urban Forest in Johor, survey design and its implementation, and finally how the data will be analyzed in the study based on the chosen model.

Chapter 4 deals with the empirical findings. The researcher presents the results that obtained from the multiple linear regression analysis, and the calculation of the consumer surplus of visitor to the urban forest sites. Also, there are a lot of figures and tables to help and explain more about the data analyses.

Chapter 5 concludes the conclusions of the study; summary of findings, suggestions and recommendations to the local authorities and limitations of the study.

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APPENDIX A

PART A: GROUP TRIP PATTERN

This part of question is referring to the 2-way trip from your residence to the urban forest site

Please tick (/) only one answer to indicate your response:

Age: ___ years old **Sex:** ( )Male ( )Female

1. How did you travel on this trip?

( ) Walking ( ) Own vehicle ( ) Bicycle ( ) Public transport
( ) Others: _____

2. Your residency area: _____

3. Estimation of total distance (2-way) to this trip: ___ km

4. When you are usually visiting this site?

( ) Morning ( ) Afternoon ( ) Evening **On the…**
( ) Weekdays ( ) Weekends: Saturday & Sunday

5. With whom do you always go to this site?

( ) Family ( ) Friends ( ) Colleagues ( ) Alone
( ) Others: _____

6. Time spent in this site?

( ) < 15 min ( ) 15-30 min ( ) 30 min-1 hr ( ) 1 ½-2 hrs
( ) > 2 hrs

7. How many times you visit this site within a year: _____

8. Why did you choose to go this site?

_____
_____

9. Where would you go if did not make this trip?

( ) Another urban forest site: _____
( ) Another recreational site: _____
( ) Another place: _____
( ) Stay at home
( ) Others: _____

10. How much do you spent on each of the following expenditures in this trip? State the best amount:

Meals: food court, restaurant RM ___
Shopping: foods RM ___