UNIVERSITI PUTRA MALAYSIA

PERCEPTIONS OF LOCAL COMMUNITY AND VISITORS AND THEIR WILLINGNESS TO PAY FOR FIREFLY CONSERVATION IN KUALA SELANGOR, MALAYSIA

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IPTPH 2021 5

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By

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

March 2021

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

PERCEPTIONS OF LOCAL COMMUNITY AND VISITORS AND THEIR WILLINGNESS TO PAY FOR FIREFLY CONSERVATION IN KUALA SELANGOR, MALAYSIA

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March 2021

Chair : Associate Professor Zaiton Samdin, PhD
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Fireflies are a type of insect from the family Lampyridae and order Coleoptera. It has the unique feature of producing light from its lower abdomen. Fireflies are an ecotourism icon for the Kuala Selangor district and firefly watching activities have been operating since 1980 in Kampung Kuantan Firefly Park (KKFP). The presence of fireflies in KKFP has given many benefits to the local communities in terms of economic, social, and cultural benefits. However, the population of fireflies has decreased by 42% since 2007 and this can be seen from the current number of fireflies of 400 compared to 600 individuals previously on each Berembang tree. This event occurred as a result of various factors, including habitat destruction, artificial light, use of pesticides, and conversion of land use to oil palm plantations and shrimp ponds. Various efforts to conserve fireflies and their habitats have been done and this study also would contribute to the conservation efforts of fireflies from the aspect of economic valuation. This study aimed to identify the awareness, perception, and attitude of respondents towards the conservation of fireflies. Respondents would express their views by choosing one of the five interval scales for the given statement. In addition, this study also identified factors that influence the Willingness to Pay (WTP) for the conservation of fireflies in Kuala Selangor by using the Contingent Valuation Method (CVM). The Double Bounded Dichotomous Choice (DBDC) format is a method that offers the starting bid value to the respondents. A total of 730 (330 visitors and 400 locals) were selected using convenience and stratified random sampling techniques. The results revealed that the level of awareness of the respondents was moderate and had a positive perception and attitude towards the conservation of fireflies in Kuala Selangor. The study also found that the factors that influenced the WTP for visitors include bid value, age, household's number,

monthly income, awareness, attitude, and perception. The WTP for locals is influenced by bid value, gender, awareness, and attitude. The study found that the means WTP for visitors of RM12.93 was higher than local community and RM12.43 per individual per year for firefly conservation. The total economic value for the conservation of fireflies and their habitat in Kuala Selangor was estimated at RM741, 768.24 visitors, lower compared to the local community at RM2, 338, 083. The findings on the economic value of this study is useful because it serves as a guideline for policymakers and the Kuala Selangor District Council to develop a sustainable conservation plan for the protection of these natural resources in the long run.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains

PERSEPSI PENDUDUK TEMPATAN DAN PELAWAT DAN KESANGGUPAN MEREKA MEMBAYAR UNTUK PEMULIHARAAN KELIP-KELIP DI KUALA SELANGOR, MALAYSIA

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Kelip-kelip merupakan sejenis serangga yang berasal dari famili Lampyridae dan order Coleoptera. Ianya mempunyai keistimewaan yang unik iaitu menghasilkan cahaya dari bahagian bawah abdomennya. Kelip-kelip merupakan ikon ekopelancongan bagi daerah Kuala Selangor dan aktiviti melihat kelip-kelip beroperasi semenjak tahun 1980 di 'Kampung Kuantan Firefly Park' (KKFP). Kehadiran kelip-kelip di Kampung Kuantan telah memberi banyak manfaat kepada penduduk tempatan iaitu dari segi ekonomi, sosial dan budaya. Walau bagaimanapun, populasi kelip-kelip telah berkurangan sebanyak 42% sejak 2007 dan ini dapat dilihat dari bilangan kelip-kelip pada masa ini iaitu terdapat 400 ekor kelip-kelip berbanding 600 ekor sebelumnya di setiap pokok Berembang. Peristiwa ini terjadi akibat daripada pelbagai faktor, antaranya pemusnahan habitat, cahaya buatan, penggunaan racun perosak dan penukaran penggunaan tanah kepada ladang kelapa sawit serta kolam udang. Pelbagai usaha pemuliharaan kelip-kelip dan habitatnya telah dilakukan dan kajian ini turut menyumbang kepada usaha pemuliharaan kelip-kelip tetapi dari aspek penilaian ekonomi. Kajian ini bertujuan untuk mengenalpasti kesedaran, persepsi dan sikap responden terhadap pemuliharaan kelip-kelip. Responden perlu menyatakan pandangan mereka dengan memilih salah satu daripada lima skala interval bagi penyataan yang diberikan. Disamping itu, kajian ini juga mengenalpasti faktor yang mempengaruhi kesanggupan membayar bagi pemuliharaan kelip-kelip di Kuala Selangor dengan menggunakan Kaedah Penilaian Kontinjen (Contingent Valuation Method). Format Double Bounded Dichotomous Choice (DBDC) merupakan kaedah yang menawarkan nilai bid permulaan kepada responden. Kaedah ini digunakan untuk menganggar perbezaan nilai kesanggupan membayar dalam kalangan responden terhadap pemuliharaan kelip-kelip. Seramai 730 (330 pelawat KKFP dan 400 penduduk tempatan) telah dipilih menggunakan teknik persampelan kemudahan dan berstrata. Hasil kajian menunjukkan tahap kesedaran responden adalah sederhana, serta mempunyai persepsi dan sikap

yang positif terhadap pemuliharaan kelip-kelip di Kuala Selangor. Kajian juga mendapati bahawa faktor yang mempengaruhi kesanggupan membayar bagi pelawat termasuk nilai bid, umur, bilangan isi rumah, pendapatan bulanan, kesedaran, sikap dan persepsi. Manakala, kesanggupan membayar bagi penduduk tempatan pula dipengaruhi oleh nilai bid, jantina, kesedaran dan sikap. Penemuan ini menunjukkan bahawa purata WTP bagi pelawat; RM12.93 lebih tinggi daripada penduduk tempatan, dan RM12.43 bagi setiap individu per tahun terhadap pemuliharaan kelip-kelip. Nilai ekonomi keseluruhan untuk pemuliharaan kelip-kelip serta habitatnya di Kuala Selangor dianggarkan sebanyak RM741, 768.24 bagi pelawat, dimana adalah lebih rendah berbanding dengan penduduk tempatan RM2, 338, 083. Penemuan mengenai nilai ekonomi kajian ini berguna kerana ianya berfungsi sebagai garis panduan kepada penggubal dasar dan Majlis Daerah Kuala Selangor untuk membuat perancangan pemuliharaan secara lestari untuk melindungi sumber semulajadi dalam jangka masa yang panjang.

ACKNOWLEDGEMENTS

Thanks to Allah Almighty, for granting the opportunity to further study into the Master level at the Institute of Tropical Forestry and Forest Products, Universiti Putra Malaysia. I would like to express my deepest appreciation to the study supervisor, Associate Professor Dr. Zaiton Samdin and co-supervisor, Dr. Wan Norhidayah W Mohamad who were immensely helpful, and their guidance and support throughout this study. I am deeply indebted to Masbudi Malek, Hassan Ambiah, Mohd Rizan Haron and the locals for their invaluable help during the survey in Kuala Selangor. I deeply appreciated the warm hospitality during the meeting with the locals. I would like to express my special thanks to my family, especially my parents, Rosli Zakaria and Sharul Bariah Ismail; my husband Amirul Izam Fauzi; all lecturers, especially Dr. Mohamad Roslan Mohamad Kasim, Dr. Puan Chong Leong and also friends for their passionate encouragement and support towards the completion of this study well. I would also like to thank the Ministry of Higher Education for the grant FRGS/1/2018/WAB13/UPM/02/3 in providing the financial support.

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LIST OF ABBREVIATIONS

AEA	Averting Expenditure Approach
ATP	Adenosine Triphosphate
CBET	Community-Based Ecotourism
CM	Choice Modelling
CS	Consumer Surplus
CV	Compensating Variation
CVM	Contingent Valuation Method
DBDC	Double Bounded Dichotomous Choice
DOSM	Department of Statistic Malaysia
EFA	Exploratory Factor Analysis
EV	Equivalent Variation
FAO	Food and Agricultural Organization
FRIM	Forest Research Institute Malaysia
HP	Hedonic Pricing
IUCN	International Union for the Conservation of Nature
KKFP	Kampung Kuantan Firefly Park
KSDC	Kuala Selangor District Council
MLE	Maximum Likehood Estimator
MP	Market Pricing
NEP	National Ecotourism Plan
NUV	Non-Use Value
RP	Revealed Preference
SBDC	Single Bounded Dichotomous Choice
SP	Stated Preference

TCM	Travel Cost Method
TEV	Total Economic Value
TPB	Theory Planned Behavior
TVC	Total Value Curve
UV	Use-Value
WTA	Willingness to Accept
WTP	Willingness to Pay
EV	Equivalent Variation
FAO	Food and Agricultural Organization
FRIM	Forest Research Institute Malaysia

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Malaysia is a developing country located on the equator and recognised as mega diverse country rich in endemic species (Ministry of Natural Resource and Environment, 2006). Due to the vast natural assets available in this country, the resources have been utilised to generate income for national economy. Thus, Malaysia's reliance on its natural resources to fuel industrialization has resulted in increasing pressure on environmental resources. As such, attempts to incorporate sustainable development into governmental policies in Malaysia have been made in order to curb environmental issues, preventing further loss of flora and fauna (Hezri & Nordin Hasan, 2006).

Referring Mohd Shahwahid et al. (2016), Malaysia is a country with high biodiversity in the rainforests, but Malaysia is at risk of losing its natural resources when its economic development is not in line with the conservation and protection of ecosystems. In Malaysia, firefly has become an attraction in tourism since 1980 (Syed et al., 2001). Firefly is a tourism icon for Kuala Selangor where there are many local and foreign tourists coming to see the uniqueness and beauty of fireflies. Kampung Kuantan is renowned for its firefly watching activities compared to other areas in Malaysia (Nada, 2015). There are three species of firefly that are present in Kampung Kuantan. *Pteroptyx tener* is the most dominant species followed by *Pteroptyx valida* and *Pteroptyx malaccae* (Syazlina et al., 2016). The firefly from the genus *Pteroptyx* is able to perform bioluminescent courtship and lives in large numbers along the riverbanks in mangrove area (Wan Jusoh et al., 2010). The synchronous flashing pattern can only be found on the firefly species in Southern Asia and the western Pacific, from East India through Thailand, Malaysia and Indonesia to the Philippines and Papua New Guinea (Hogarth, 1999; Saib et al., 2016). There were reported 15 species of genus *Pteroptyx* in South Asia, from which Ballantyne (2001) recorded 11 species and Ballantyne et al. (2015) recorded another four species.

The presence of fireflies creates an ecotourism element, which has a positive impact on socio-economic, environmental, and cultural benefits to local and national communities (Brandon, 1996). Ecotourism offers provide three benefits, which are to: a) enhance the trade and development prospect of the country; b) become a source of income for the management and maintenance of natural and cultural sites; and c) become an impetus for local economic expansion. The International Ecotourism Society (1990) defines ecotourism as

a dependable journey to common regions that conserve nature and maintain the welfare of the local community. The tourism was undertaken in a protected area in order to appreciate nature, which encourages nature conservation and low tourist impacts as well as provides socio-economic involvement with the locals (International Union for the Conservation of Nature (IUCN), 2016).

The congregating synchronous glimmering firefly (*Pteroptyx olivier*) has a good impact on economic benefits in the Southeast nations as an ecotourism symbol (Sartsanga et al., 2018). Sustainable tourism in wetlands is essential forthe preservation and conservation of ecological services. Natural resources in protected areas have non-market values and cannot be traded, where the natural resources have no price in the market Thus, the way to protect this area is to balance tourism activities, and the impact on the environment. The fees imposed on visitors are one option to make the management of the protected area more efficient and sustainable (Laarman & Gregersen, 1996).

Firefly and its habitat are categorised under non-market value, and the market value of an ecosystem service is difficult to estimate. According to Demir (2015), the economic valuation used to provide market value to biodiversity can be divided into indirect use-value and direct use value. Indirect value is applicable to ecosystem services such as carbon sequestration and wildlife habitat. Direct use, is related to utilized products provided by the ecosystem such as food resources, medicine, and aesthetic value. The economic value of non-market goods or services can be estimated by Contingent Valuation Method (CVM) (Mitchell & Carson, 1989), and it incorporates the concept of Willingness to Pay (WTP), to identify the value that a visitor affords to pay. WTP is the maximum value that individuals are willing to pay for enjoying the natural beauty and improving the environmental quality. The presence of fireflies in wetlands has had a good impact on socioeconomics such as being a major source of income for the locals. However, visitors, locals and organizations must be aware that the interdependence between ecosystems and human requires conservation for the sustainability of resources in the future.

In the ecotourism sector, the emphasis on the factors of conserving the well-being of the ecosystem as well as the factors pertaining to awareness, perception and attitude are essential that need to be taken into account for preservation of nature. Notwithstanding, according to Ruhana et al. (2017), the awareness and knowledge of conservation are still at the infancy level. The environmental education activities such as audio-visual and printed materials are important in raising public awareness. In addition, the preservation of flora and fauna in their natural habitats should be publicly disclosed, so the public can know the challenges and threats faced by the wildlife in their native habitat. It helps in educating the public on preserving and conserving natural ecosystems (Toronto Zoo, 2012). To completely accomplish the preservation targets, it is essential to create the natured-based type of the tourism industry, especially ecotourism, which conserves the nature ecosystem (Grilli et al., 2014).

In terms of perception and attitude, the emphasis is given on individual behaviour towards conservation activities. It is important to know public understanding of something because every human being has different preference and background, especially when it comes to nature. Brechin et al. (2002) conclude that individuals' perspectives are influenced by their patterns of thought and conflict, and thus, affect conservation efforts. This perspective is important, especially in conservation, where it improves government's policy on nature conservation and it contributes to the supply of information and analysis of priorities to the needs of the community as well as the social and political elements of the system. On the other hand, attitude is closely related to perception, which is influenced by the individual's belief and desire towards the action. It is also tied to the emotional element (Low & Altman, 1992) that affects positive behaviour or vice versa. The behaviour of an individual is also included in the pursuit of conservation efforts and can be valued based on people's awareness, perception, and attitude toward conservation.

1.2 Importance of Economic Valuation

Economic valuation is the attempt to assess something, like ecosystem services, that turn out to be of no particular market value and it depends on an individual's WTP for the service based on the benefits and resources that have been provided, when in fact, we do not have to pay anything (Barbier & Knowler, 1997). In this study, the economic value for the conservation of fireflies had been measured by CVM and WTP.

According to Pagiola et al. (2004), this valuation aims to obtain monetary valuation that can be used to maintain, develop and assist in sustainable conservation. It also uncovers the relevant value as a part of the aspect of management and also to understand the contribution of the ecosystem towards local community in economical aspect. It also plays an important role in biodiversity conservation in developing countries (Naidoo, 2008). According to Matthew et al. (2011), the economic assessment can be used to determine the benefits obtained by a community as well as to educate the community on the importance of conservation of natural resources with the concept of WTP so as to ensure resources are used at a sustainable level.

For example, the protected areas have staff, such as rangers and guards, to monitor the preservation of flora and fauna. This protected area has its own certain amount of cost allocated by the government for conserving nature. In addition, agricultural and fishery products have market values that can generate revenue for traders. The application of the concept has been attempted on ecosystem services, where such services should have values that can be used to improve human welfare and manage ecosystems sustainably (Barbier et al., 1997).

The total economic value (TEV) is divided into use-value (UV) and non-use value (NUV) (Pearce & Warford, 1993). The UV is further divided into two groups, notably direct use (e.g. fisheries, fuelwood, and wildlife resources) and indirect use value (e.g. recreation and nutrient retention). The indirect use is ecological functions and services of an ecosystem that have no market value and is difficult to quantify. Thus, this research is designated as a reference and guideline for the valuation of firefly conservation.

Specifically, this research focused on WTP among local communities and visitors for firefly's conservation. Meanwhile, this research will also provide information on understanding and awareness of firefly conservation. Kuala Selangor District Council (KSDC) stated that the entrance fee is RM50 per boat (maximum four individuals), which is the value that has been set since 1980 and it was determined without considering any factor. This review is an input of decision making for KSDC to re-determine and re-evaluate the fees to assist the financial and maintenance for the conservation of firefly habitat. It also shows the significance of conservation as an effort towards the local, especially in socio-economic, cultural, and ecological aspects.

The valuation of firefly conservation can be related to the research in Korea, where Hwang et al. (2020) determined the economic values of firefly by distributing 200 questionnaires in Muju, South Korea. The estimated WTP per head was USD16.58 per year for the conservation of fireflies in Korea. WTP is often applied in non-use economic values, as Freeman (2003) suggested that the diversity of NUV can be produced by biodiversity conservation, which depends on the mentalities and ethical motivation of respondents towards the conservation of those species. Individuals are willing to pay for the conservation of the species because it provides many benefits to them and future generations, especially in the socio-economic aspects (Langford et al., 2001).

1.3 Problem Statement

In the state of Selangor, Kampung Kuantan Firefly Park (KKFP) is popular among local and international tourists for firefly watching activity (Kirton et al., 2006). There is also the privately owned Bukit Belimbing firefly resort located, approximately 16km from the KKFP. However, the resort also facing the problem of declining firefly populations because of habitat destruction, poorriver water quality and eroded river banks. The riverbanks have been largely converted to agricultural areas to generate income for the locals. Kampung Kuantan Firefly Park was chosen as the study area because this park is the most popular with firefly watching activities in Malaysia, has been operating for over 40 years and is a source of income for many locals. According to the KSDC (2016), the presence of fireflies gives the potential for commercialization as a tourism attraction of Kampung Kuantan. A firefly has the ability to emit bioluminescence or light from its lower abdomen, thereby offering as an ecotourism icon for Kuala Selangor. As of now, the area has been developed

as an information centre that aims to raise awareness on fireflies and at the same time, create an opportunity for employment to the locals (Adlan, 2012). Although KKFP provides benefits to the locals and tourists, the area is not completely free from issues.

According to the Forest Research Institute Malaysia (FRIM), fireflies' populations have been decreasing in Kampung Kuantan for about 42% over 10 years since 2007. There used to be over 600 fireflies on each Berembang tree in the past, but it has now reduced to 400 fireflies only (Mohd Hafizi, 2018). Lewis et al. (2020) mentioned that the main threats to the firefly populations in the world are habitat destruction, artificial light and the use of pesticide. Currently, fireflies and their mangroves are becoming increasingly threatened by human activities (Ohba & Wong, 2004; Wong, 2008; Wan Faridah et al., 2010) such as land clearing and agricultural activities. Conservation is one of the mechanisms in protecting fireflies and their habitats to ensure the sustainability of their lives. With respect to global conservation efforts, firefly has been neglected compared to other types of invertebrates (Lewis et al., 2020).

There is a lack of research on the awareness, perception, and attitude of firefly conservation among visitors and local community in Kuala Selangor. Emphasis on community awareness should be enhanced so that local community would value nature and recognise that nature and humanity are mutually interdependent. Community awareness contributes to the sustainability of natural resources, such as when people are aware of the ecological functions of mangrove forests, it has a good impact on reducing activities that cause degradation of mangrove (Food and Agricultural Organization, 2007). Referring to Faridah-Hanum et al. (2012), the Malaysian Forestry Department highlights the importance of public awareness of mangroves. It also mitigates the threats to biodiversity (Uddin, 2017) including fireflies.

An individual's views, opinions, beliefs, desires, and understanding are the elements of perception and they could influence one's attitude towards conservation of nature. The perception of conservation is important in improving the government's policy on the environment as well as maintaining the welfare of the people and the political system (Durand & Lazos, 2008). Nevertheless, the perception and attitude of society actually influence their actions whether they support the conservation of firefly or otherwise. Based on previous studies, Ahmad et al. (2012) claimed that the intention of individual support in this aspect of conservation is due to the positive attitude towards conservation.

Individuals, who have a positive attitude and perception, usually support conservation efforts because they are concerned about the increasing loss biodiversity resources (Anderson et al., 2003; Afiq & Shazali, 2016). Thus, this study contributes to the understanding of views and ideas among the

community on conservation as well as assisting in the management, planning and evaluation and of firefly conservation efforts in Kampung Kuantan.

The ecosystem services provided by fireflies and their habitats can be categorized as no-market value, as the market value of such ecosystem services is difficult to be estimated. Economic valuation provides a tool for sustainable development by showing how dependent the economy is on an ecosystem and what would be lost if the ecosystem is not protected. The management and local community in Kampung Kuantan depend on the existence of fireflies as a source of income through ecotourism (Khoo et al., 2012). The visitors, in turn, pay to gain experience and satisfaction from witnessing the beauty of the ecosystem and service provided.

There are few studies on economic valuation conducted on fireflies in Kuala Selangor, Malaysia. For example, Jamal (2000) studied economic benefits of wetlands-based recreation at Kuala Selangor fireflies and Nature Park by using the Travel Cost Method. Chuen (2010) conducted a research on the preliminary assessment of the socio-economic importance of Selangor's mangrove forests. Most recently, Hwang et al. (2020) assessed the value of fireflies as a tourist attraction using CVM involving the New Environmental Paradigm (NEP) in South Korea. The researcherstated that the WTP value of firefly was USD16.58 and it was influenced by gender, bid and income of the respondents. Therefore, research on estimating the difference on WTP and its influencing factors among the local community and visitors for firefly conservation using CVM is still limited. Due to the limited information recorded or documented on firefly's conservation, this study is needed to obtain the value of the WTP of the firefly and support conservation efforts from an economic aspect.

Considering the declining population of the firefly, many researchers are concerned about it and have conducted studies on fireflies to ensure their survival. However, most research has only focused on the topic related to firefly distribution and abundance (see Nallakumar, 2002; Nada et al., 2008; Wan Faridah et. al., 2010; Foo & Mahadimenakbar, 2015). Therefore, this study will help in the conservation of the fireflies by placing economic value on the fireflies. Furthermore, the information on the distribution and abundance of the firefly is less detailed and undocumented (Izfa & Sharifah, 2017). Syazlina et al. (2016) argued that reliable and detailed information on tourism management for firefly is still lacking. The latest information on the distribution and abundance of fireflies is crucial in this study because it can provide accurate facts about the current declining firefly status and convey the right messages to various stakeholders.

Ultimately, KSDC, local community and tourists need to cooperate in order to ensure the conservation of the firefly habitat. Thus, proper plans are needed to facilitate governance for conservation and tourism. Williamson (1996) has indeed highlight that a proper governance requires mutual understanding from

parties which must present trade-offs among parties to achieve the desired goal.

1.4 Objectives

The general objective of this study was to estimate the willingness to pay for firefly conservation. The specific objectives of this study were:

a. To determine the awareness, perception and attitude of local community and visitors towards firefly conservation in Kuala Selangor;
b. To identify factors that affects the willingness to pay for firefly conservation; and
c. To investigate the differences in the WTP value of firefly conservation among the local community and visitors.

1.5 Significance of the Study

Firefly is a beetle that plays a role in the ecosystem and is also an ecotourism attraction in Kuala Selangor. It is a pollinator agent and can be an indicator for environmental health. The presence of the fireflies indicates that the environment (mangrove) and water quality in the area are still in good condition (Mahadimenakhbar et al., 2018). While its role in ecotourism is also significant as it is a major source of income for the population and contributes to the economic growth of Malaysia. Therefore, this study was designed to provide useful information in describing visitors and local's WTP and awareness, perception and attitude in conservation of firefly**.**

1.5.1 Local Community

The local community is the group closest to the firefly habitat and they depend on the natural resources from the mangrove forest. Therefore, this study will reveal the level of awareness, perception, and attitude of the community towards firefly conservation. This study also identifies the importance and dependence of the local community on fireflies or vice versa. The community's sensitivity to the declining status of the population is also determined, whether or not they are willing to pay for firefly conservation, andthe factors that influence them to pay for the conservation of the fireflies and their habitat. Assessing the willingness to pay of locals to ensure the sustainability of the fireflies provides an idea about their willingness to allocate higher expenses in order to sustain firefly populations in the future.

1.5.2 Visitor

The visitors as defined in this study were individuals who visited the KKFP only to see the fireflies. This study aimed to provide views and opinions of visitors on the conservation and firefly. Hence, the investigation into visitor's knowledge of fireflies. This includes the life cycle of firefly, background, population status, causes of population decline, and the related conservation measures. The study also explores the purpose of the visit and the factors influencing their willingness to pay for firefly conservation at the KKFP.

1.5.3 Kuala Selangor District Council (KSDC)

KSDC is responsible for managing and maintaining the KKFP. According to an explanation from the KSDC, they want to increase the entrance fee to KKFP to cover the high maintenance costs and the current fee is RM 50 per boat (that can fit four adults). However, they cannot simply raise the price without justification and solid evidence to back the need. This study used the concept to measure the economic value of firefly conservation.

Therefore, the WTP value as a benchmark for the fee rises. Most importantly, this study suggested to KSDC that the increase in fees should be channelled to conservation. The conservation fund will be used to carry out activities that support conservation efforts, such as awareness programmes, tree planting and clearing the rivers from waste. Specifically, findings from this study could be used to convince the KSDC to emphasize on conservation and encouraging them to prioritize adequate preservation of natural resources.

1.6 Organization of Thesis

This thesis is organized into five chapters. Chapter 1 describes a general background of the study that explains the related topics on firefly, conservation, ecotourism, awareness, perception and respondent's attitude towards conservation activities. It also explains the problem statement that arises and needs to be solved through this study. The importance of research on several parties, such as locals, visitors, Kuala Selangor district council and academicians, was also elaborated.

Chapter 2 provides literature reviews from various related topics with an in-depth discussion provided with the support of previous studies. Among the main topics described include the life cycle of a firefly, ecotourism, ecosystem resource valuation, TEV, CVM, related bias, WTP and its influence factors as

well as the previous study of economic valuation on the environment. Each topic is specifically related to each other to support the aim of this study.

Chapter 3 describes the research methodology, the determinants used in the experimental design, elaboration on data analysis, sample design, sample size (the number of respondents was determined by using Krejcie and Morgan's (1970), questionnaire design for visitor and local community, analysis of dichotomous choice of CVM, pre-test, pilot test and formula of WTP estimation.

The results from data collection are presented in Chapter 4. It also discusses the respondent's background, attitude and awareness, perception and attitude toward conservation and estimated of WTP value based on different sample. The final chapter (Chapter 5) explains the summary and concluding remarks based on the results. The limitations and recommendations derived from this study are presented to ensure that each limitation can be successfully addressed in future studies.

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