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ECONOMIC VALUATION OF WETLAND ECOSYSTEMS IN PAYA INDAH WETLANDS, SELANGOR, MALAYSIA

SIEW MEI KUANG

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ECONOMIC VALUATION OF WETLAND ECOSYSTEMS IN PAYA INDAH WETLANDS, SELANGOR, MALAYSIA

By

SIEW MEI KUANG

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ECONOMIC VALUATION OF WETLAND ECOSYSTEMS IN PAYA INDAH WETLANDS, SELANGOR, MALAYSIA

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SIEW MEI KUANG

July 2014

Chair : Mohd Rusli Yacob, PhD
Faculty : Economics and Management

Wetlands provide numerous ecosystem goods and services that are important to development and survival of humanities. They provide food and clean drinking water, offer a unique habitat for many different species and provide hydrologic functions as well as support in industries such as tourism and recreation. The public good characteristics and open access nature of wetlands often result in wetlands being undervalued in decision about their use. Many policies and decisions do not take into account the many goods and services that wetlands provide and thus leading to the rapid degradation and wetlands loss. Economic valuation of wetland ecosystem goods and services aims to investigate public preferences and to quantify these goods and services in monetary term. Paya Indah Wetlands is a human-made wetland, which was formerly a mining site. Economic valuation of Paya Indah Wetlands can play an important role in determining appropriate trade-off between wetland conservation and profitable development projects that result in biodiversity loss. The objective of this study is to estimate the economic value of wetland goods and services provided by Paya Indah Wetlands. In this study, the total economic value was captured which was the sum of all direct and indirect use value plus non-use values of the wetland ecosystem services. Contingent valuation method was employed to estimate the willingness to pay of domestic visitors to Paya Indah Wetlands. The data were collected through face-to-face interview. Findings of the study have revealed that Paya Indah Wetlands contributes an estimated annual value of RM 349, 604. In addition, the domestic visitors to Paya Indah Wetlands were willing to pay RM 7.39 as entrance fee per person. The price of entrance fee and respondent income were the significant determinants and influenced visitors' willingness to pay. Results of this study provide evidence of the importance of sustaining and enhancing those resources and the ecosystems that provide them. This suggests that the policy and decision makers should incorporate the full economic value of wetlands into decision about whether to conserve or converse the wetland ecosystems for achieving sustainable use and management of wetlands. Results of this study also facilitate in establishing an efficient and realistic pricing policy for Paya Indah Wetlands, which would help in reducing the overcrowding and excessive exploitation of the wetland use.

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

PENILAIAN EKONOMI EKOSISTEM TANAH LEMBAP DI PAYA INDAH WETLANDS, SELANGOR, MALAYSIA

Oleh

SIEW MEI KUANG

July 2014

Pengerusi : Mohd Rusli Yacob, PhD
Fakulti : Ekonomi dan Pengurusan

Tanah lembap memberi pelbagai barang-barang dan perkhidmatan ekosistem yang penting untuk pembangunan dan kehidupan manusia. Ia digunakan sebagai sumber makanan dan bekalan air, merupakan habitat bagi species tumbuh-tumbuhan dan haiwan dan mengekalkan kitaran hidrologi serta menggalakkan industri rekreasi dan pelancongan. Namun begitu, ciri-ciri tanah lembap sebagai barang awam dan tiada pengecualian dalam penggunaannya mengakibatkan nilai tanah lembap sentiasa diabaikan dalam keputusan mengenai kegunaannya. Terdapat banyak polisi-polisi tidak mengambil kira kepentingan tanah lembap dan ini menyebabkan degradasi dan kehilangan tanah lembap berlaku dengan pesat. Penilaian ekonomi terhadap barang-barang dan perkhidmatan ekosistem tanah lembap adalah bertujuan untuk mengenalpasti pilihan masyarakat dan menghitung nilai barang-barang dan perkhidmatan tersebut dalam bentuk kewangan. Paya Indah Wetlands merupakan tanah lembap buatan manusia yang terhasil akibat aktiviti perlombongan bijih timah. Penilaian ekonomi terhadap Paya Indah Wetlands memainkan peranan penting dalam menuntut satu “trade off” antara pemuliharaan tanah lembap dan projek-projek pembangunan yang mendatangkan keuntungan tetapi akan menjejaskan sumber biodiversiti di kawasan sekitarnya. Kajian ini bertujuan untuk membuat anggaran nilai ekonomi barang-barang dan perkhidmatan tanah lembap di Paya Indah Wetlands. Dalam kajian ini, jumlah nilai ekonomi yang terdiri daripada perjumlahan nilai guna langsung dan tidak langsung campur dengan nilai bukan guna telah diperhitungkan. Kaedah Penilaian Kontingen digunakan bagi mengenalpasti kesanggupan membayar oleh pengunjung-pengunjung tempatan terhadap Paya Indah Wetlands. Data diperoleh melalui kaedah temubual. Hasil kajian mendapati bahawa Paya Indah Wetlands dianggarkan menyumbangkan nilai tahunan sebanyak RM 349, 604. Tambahan, pengunjung-pengunjung tempatan sanggup membayar bayaran masuk sebanyak RM 7.39 seorang. Kadar bayaran masuk dan pendapatan responden merupakan faktor-faktor yang signifikan mempengaruhi nilai kesanggupan membayar pengunjung. Keputusan kajian ini memberi bukti kepada masyarakat tentang kepentingan pengekalan dan peningkatan kualiti sumber tanah lembap dan ekosistem. Pihak yang terbabit dalam pembentukan polisi

dan dasar patut menitikberat jumlah nilai ekonomi tanah lembap dalam keputusan samada melindungi atau menebus guna tanah supaya memantapkan usaha penggunaan sumber dan pengelolaan tanah lembap secara mampan. Keputusan ini juga boleh dijadikan panduan kepada pihak yang terbabit dalam mencipta polisi harga yang lebih efisien dan realistik bagi mengelakkan kesesakan dan penggunaan sumber-sumber dalam tanah lembap secara berlebihan.

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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:

Mohd Rusli Yacob, PhD
Associate Professor
Faculty of Environmental Studies
Universiti Putra Malaysia
(Chairman)

Alias Radam, PhD
Associate Professor
Faculty of Economics and Management
Universiti Putra Malaysia
(Member)

_____
BUJANG KIM HUAT, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

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Signature: _____
Name of Chairman of Supervisory Committee: Associate Professor Dr Mohd Rusli Yacob

Signature: _____
Name of Member of Supervisory Committee: Associate Professor Dr Alias Radam

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LIST OF ABBREVIATIONS

CM	Choice Modelling
CV	Contingent Valuation
CVM	Contingent Valuation Method
DC	Dichotomous Choice
DWNP	Department of Wildlife and National Parks
FRIM	Forest Research Institute Malaysia
HPM	Hedonic Price Method
NGOs	Non-governmental Organizations
NOAA	National Oceanic Atmospheric Administration
PIW	Paya Indah Wetlands
RM	Ringgit Malaysia (Unit of current money in Malaysia)
RP	Revealed Preference
SP	Stated Preference
TCM	Travel Cost Method
TEV	Total Economic Value
UNWTO	World Tourism Organization
USD	United States Dollar (Unit of current money in United States)
WTA	Willingness to accept
WTP	Willingness to pay
WWF	World Wildlife Fund

CHAPTER 1

INTRODUCTION

1.1 Background of Study

According to Malaysia Wetland Directory, wetlands cover approximately 10% or 32,975,800 hectares of total Malaysia land surface. They are categorized into ten major wetland types, namely mangroves, mudflats, nipa swamp, freshwater swamp forest, peat swamp forest, lakes, oxbow lakes, river systems, marshes and rice paddy fields. Specifically, peat swamp forests cover the largest area: it is over 2 million hectares in Malaysia and mangroves are the second large, covering an area of 0.6 million hectares (Wetlands International, 2010).

Wetlands are the most productive ecosystem in the world. They provide numerous ecosystem goods and services to the ecological, economic, and social wellbeing of the society such as fish and wildlife habitats, flood control, shoreline erosion protection, water quality improvement, natural products, aesthetic services and scientific and educational information (de Groot, 1992). Moreover, the natural beauty of the area and its natural resources bring new economic opportunity through ecotourism and recreation. Bird and wildlife watching, hunting, fishing, canoeing, hiking and photography are some of the famous recreational activities in wetlands. Wetland goods and services are difficult to provide artificially. Therefore, conservation of wetland ecosystems is essential in order to maintain these services and enhance the economic prosperity and quality of life.

However, many goods and services provided by wetlands are considered as public goods that are not traded in the markets. The “missing market” fails to assign the market price for these goods and services, and thereby the economic value of wetlands is frequently not fully aware of when it comes to making decisions about their use. It consequently carries a risk of environmental degradation by overutilization of resources, conversion threats from agricultural, industrial and residential development, and pollutions. In order to preserve wetlands from further degradation, the benefits of wetlands should be defined and their value quantified.

Economic valuation is a process to estimate the economic value of ecosystem goods and services. In other words, it attempts to put the price on those goods and services (Bateman *et al.*, 2002). The economic value of wetland goods and services describes the benefits generated from using those goods and services and also the benefits they provide for society. Integrating this information into

decision-making enables the planners and policy makers to decide an optimal management strategy in order to allocate resources efficiently. Various valuation techniques are developed for measuring the economic value of ecosystem goods and services, and Contingent Valuation Methods (CVM) is used in this study.

1.2 Paya Indah Wetlands (PIW)

Paya Indah Wetlands (PIW) is a wetland-based recreational park situated in Kuala Langat District in the province of Selangor, Malaysia. It is approximately 50km from Kuala Lumpur, 15km from Kuala Lumpur International Airport (KLIA) and 4km from Dengkil (Figure 1.1). The strategic location of the area indicates its easy accessibility to visitors. PIW is a human-made wetland converted from mining area. It covers an area of 3,100 hectares including fourteen degraded mining lakes, a peat swamp forest, a logged forest area and some cleared hills. The dominant soil types in PIW are alluvial sediments of peat, clays and silts.

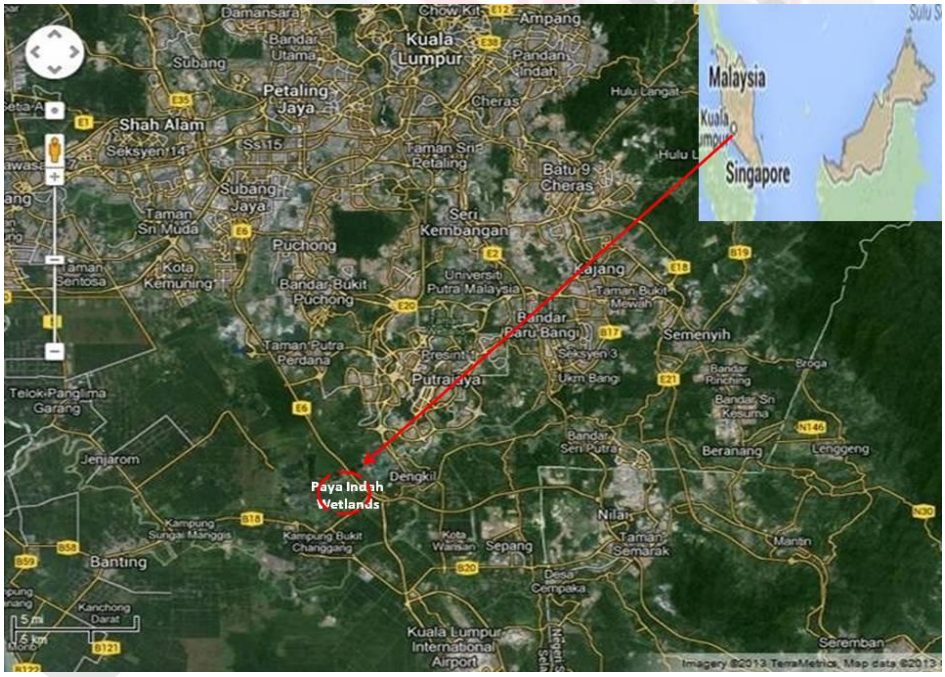

Figure 1.1: Paya Indah Wetlands Map
Source: Google Map

PIW is a part of water catchment area of the Langat river basin. The water from several streams such as Cyberjaya Canal, North Canal_N1, North Canal_S1 and North-Inlet-Canal converges on this area and then flows out into the Langat River. This flow slows down the momentum of rushing water in a

Langat river downstream. Aquifers are found in gravel, sand, silt and clay. There are shallow and deep aquifers. The groundwater contained in aquifers provides the water resources to maintain the water level in flat lowlands.

PIW was created in 1998 and has been used as recreational park for public since 2001. It was given name "Paya Indah", in its translation meaning beautiful swamp. This park has beautiful scenery and is a habitat for a wide variety of flora and fauna. According to Department of Wildlife and National Parks (2011), 229 species of both resident and migratory bird population, more than 63 species of mammals, 20 species of reptiles, 10 species of amphibians and 14 species of fish depend on PIW for food, water and shelter.

Zakaria, Rajpar and Sajap (2009) identified that PIW is famous for bird sanctuary. The highest bird density in this area includes Purple Swamphen, Lesser Whistling Duck, White-breasted Waterhen, Yellow Bittern and Cotton Pygmy Goose (Rajpar & Zakaria, 2010). PIW also provides a favourable habitat that allows migratory birds to stop over en route of East Asia during the bird migratory season. In addition, the rehabilitated mining lakes are now home to saltwater crocodiles and aquatic fauna such as Black Tilapia, Catfishes, Climbing Perch and Snakehead. Monkeys and agoutis are encountered at this area too. Red Giant Flying Squirrel (*Petaurista petaurisia*), one of the endangered species in Malaysia, has been spotted roosting in the pest swamp forest.

Among 200 species of plants at PIW, Acacia mangium trees, grasses, marshes, perch and shrubs grow everywhere. Terap and orchard trees are used for landscaping purposes. Aquatic flora species such as Lotus, Tube Sedge, Fimbristylis miliacea and Eleocharis variegate rely on this area for primary habitat.

PIW offers recreational activities including bird watching, recreational fishing, photography and nature study. However, it was closed in February 2005 due to the financial constraint to the Management of Paya Indah Wetlands. After 30 months, its administration was transferred to Department of Wildlife and National Parks (DWNP) and PIW was re-opened for everyone to enjoy on 20th October 2008. Table 1.1 lists the detail of recreational activities which currently available in this area.

Table 1.1: The Recreational Activities in Paya Indah Wetlands

Activities	Detail of Activities
Bird Watching	229 species of birds, such as Purple Swamp Hen, White Breasted Water Hen, Olive Backed Sunbird, Brown Shrike, Red Wattled, Lapwing, Swinhoe's Snipe, Yellow Vented Bulbul and Peacock Best bird watching time is in early morning of the months of September to March
Jungle Trekking	Typha Trial is a great place for trekking Visitors can hike in a woodland rather than lush jungle
Crocodiles Feeding	Crocodile feeding time is only on every weekend morning The park employee feed the crocodiles by throwing chickens into the pond
Fish Feeding	The marine life kept in ecology pond Visitors can closer looked of different type of marine life
Sightseeing	Provided the nature view along the trip Such as the lotus-covered lake, peat swamp forest, wildlife observations and also marine ecosystem
Recreational Fishing	Visitors are only allowed to angle at Typha Lake Marble Goby and Giant Snakehead are typical of the type of fish which inhabit this pool
Cycling	The park is large and bicycle is the good way of covering the distance
Kayaking	Sendayan Lake is a great place for kayak Prior reservation is needed
Biodiversity Education Programme	It is a 3 days 2 nights programme Visitors can learn about the importance of wetlands conservation and rehabilitation and the beneficial functions of the wetlands Visitors can closely looked of the animal life, such as bird and fish

Source: Paya Indah Wetlands, 2011

Moreover, DWNP has organized biodiversity educational programme especially for schools and local universities in order to improve the public awareness of the valuable role of wetland ecosystems in human lives. Many schools, governmental and non-governmental organizations have participated in this programme. In addition, the management has upgraded the facilities such as lookout tower, jetty, chalet, restaurant, information center, seminar hall, car park and public toilets. As a result, more than 9000 visitor arrivals were recorded by DWNP within three months after the reopening of PIW. It was followed by an excellent growth in 2009 when the visitor arrivals grew by 154% and 130% in 2011 (please refer to Table 1.2).

Table 1.2 : Total Arrivals in PIW, 2008-2012

Year	Number arrivals in PIW	% Growth
2008 (Oct-Dec)	9,645	
2009	24,527	154%
2010	23,692	-3%
2011	54,603	130%
2012	88,591	62%

Source: DWNP, 2011

1.3 Problem Statement

Wetlands provide numerous ecosystem goods and services that are important to development and survival of humanities. Maintaining the wetlands is not only protecting biodiversity, but also requires the sustainable use and management of all natural resources. The current lack of information about the wetlands functions and economic values often leads to ill-informed decision on wetlands management and development. This can result in functional degradation and the loss of wetlands. In an effort to ensure the sustainable development of wetlands, a mechanism for determining the wetlands values in monetary unit is essential to convey the importance of wetland goods and services to decision makers.

Paya Indah Wetlands possesses a variety of attributes of values. It makes important contributions to the hydrologic function, habitat quality, and education and research of the ecosystems. The diversity of vegetation, bird species and other wildlife, and the beauty of landscape found within the wetland provide human with tourism and recreational opportunities. PIW is thus established as a recreational park and has a protected status that prevents it from encroachment. However, the ecosystem goods and services provided by PIW are assumed to be public goods that are entirely free of charge. In other words, individuals are able to consume them by paying nothing towards the cost, subsequently resulting in free-rider problem. The open access nature of wetland goods and services leads to the unsustainable tourism development and as a result, there is an excessive depletion of wetland goods and services due to the pressure from visitors' congestion. For example, illegal fishing and vandalism are found in PIW, which cause the decline in species and wetlands' degradation (DWNP, 2007).

Moreover, the goods and services provided by PIW are not priced in the market and their value is not immediately obvious. Absence of clearly defined the value of wetlands often results in wetlands being overlooked and undervalued in decision about their use. The authorities fail to realize the potential revenue opportunities associated with the wetlands and are always attracted to the profits on other land uses. This has made it possible to trade off the wetlands

for other profitable development projects. Consequently, ecosystem degradation and the loss of biodiversity continue to be significant and thus threaten the ability of wetlands to provide ecosystem services for society.

By measuring the importance of wetlands, economic valuation can be a powerful tool to express the value of wetland goods and services in monetary unit. This information can help the authorities to incorporate the full economic value of wetlands into decision about whether to conserve or converse the wetland ecosystems. Importantly, the authorities can use this information to redress the policy failures in order to improve wise use and management of wetland goods and services. In wetland-based tourism site, the management always faces the dilemma of choosing the appropriate policy option to be implemented and possible source of revenue for prudent management of the wetland goods and services. Many park managements adopt the pricing policy by charging entrance fee to visitors. The implementation entrance fee helps to reduce the overutilization of resources and increases the revenue of recreational park. To better justify the pricing policy, the economic value of wetlands has been also used to set the fee charged to visitors to recreational park.

Therefore, this study attempts to estimate the economic value of ecosystem goods and services provided by Paya Indah Wetlands. Contingent valuation method is utilized in this study. This method directly asks an individual, through a questionnaire survey about their willingness to pay for PIW (Hodkinson, 2004). In general, people respond to wetland value differently, depending on different factors. Understanding of public attitudes towards wetland ecosytem services is a method defining the factors responsible for influencing public responses.

1.4 Objective of Study

The general objective of this study is to estimate the economic value of wetland ecosystems provided by Paya Indah Wetlands. The specific objectives are as follows:

1. To identify the socio-economic characteristics of visitors in PIW.
2. To identify the factors influencing the willingness to pay among visitors.
3. To estimate the willingness to pay (WTP) of the visitors to PIW.

1.5 Significance of Study

Valuation of wetland conservation benefits from non-users' perspective in Paya Indah Wetlands has been done by Jamal and Shahariah in 2003. However, no known study currently exists in Malaysia incorporating the monetary estimates total values of PIW, including both use and non-use values, from users' perspective. This study will be a significant endeavor in estimating the economic value associated with wetland ecosystems from visitors' perspective in PIW. Therefore, this study provides the sufficient quantitative data in addressing the gap in understanding related to the value of wetland ecosystems. The contributions of this study will be of interest to scholars in environmental economics as well as practicing managers, particularly in conservation practices.

The economic value of wetland ecosystems is measured by the value that people place on the functions and services provided by wetland. The findings of this study help stakeholders, including individuals, resource managers, corporations and decision makers, to identify the real value of wetland and understand the functions and alternative uses of PIW. This will be beneficial to stakeholders in strategic decision related to the use of effective ecosystem services management. By understanding the value of retaining intact ecosystems, resource managers and decision makers are able to factor in the long-term costs of degraded wetlands so as to implement the optimal wetland management.

This study also identifies the preferences of people for the changes in quality of wetland ecosystems. This information helps stakeholders to determine the status of wetland ecosystems and the potential flow of benefits to human wellbeing, so that effective resources allocation can be made. Stakeholders can identify the trade-off between the benefits and costs of protecting the wetland ecosystems. Moreover, this study reveals the willingness to pay of visitors for PIW and explores the factors influencing their willingness to pay. These findings are the useful insights in the pricing decision policy.

From the perspective on knowledge sharing, the results of this study will significantly contribute to the existing limited literature for Malaysia in this area of environmental economics. It will increase the knowledge of value of wetland ecosystems and serve as a future reference. It also contributes to public education projects in order to enhance the public awareness of the importance role of wetland and to sustain the resources for future generations.

1.6 Organization of Thesis

This study is organized into five chapters. Chapter one is about introduction presenting the background of study, information of study area, problem statement and research objectives. Chapter two provides the theoritical background of environmental valuation and reviews of previous studies particularly related to the method of contingent valuation method. Chapter three presents the methodological framework of contingent valuation method, data collection, survey design and willingness to pay estimation framework. The empirical results of respondents' profile, respondents' attitudes toward wetland ecosystems and estimated willingness-to-pay values are presented in Chapter four. Finally, the summary and conclusion are summarized in Chapter five.

REFERENCES

Adaman, F., Karali, N., Kumbaroglu, G., Or, I., Ozkaynak, B., & Zenginobuz, U. (2011). What Determines Urban Household's Willingness to Pay for CO_2 Emission Reductions in Turkey: A Contingent Valuation Survey . *Energy Policy 39* , 689-698.

Adjaye, J. A., & Tapsuwan, S. (2008). A Contingent Valuation Study of Scuba Diving Benefits: Case Study in Mu Ko Similan Marine National Park,Thailand. *Tourism Management 29*, 1122-1130.

Alias, R., & Shazali, A. M. (2005). Use of Dichotomous Choice Contingent Valuation Method to Value the Manukan Island, Sabah. *Pertanika Journal Social, Science & Human 13(1)*, 1-8.

Alias, R., Shazali, A. M., Abas, S., & Afizah, M. (2002). Willingness of Local Tourists to pay for Conservation of Tourism Sports in the Damai District Sarawak. *ASEAN Journal on Hospitality and Tourism 1*, 53-63.

Amigues, J.-P., Boulatoff, C., Desaigues, B., Gauthier, C., & Keith, J. E. (2002). The Benefits and Costs of Riparian Analysis Habitat Preservation: A Willingness to Accept/Willingness to pay Contingent Valuation Approach . *Ecological Economics 43*, 17-31.

Amirnejad, H., Khalilian, S., Assareh, M. H., & Ahmadian, M. (2006). Estimating the Existence value of North Forests of Iran by using a Contingent Valuation Method . *Ecological Economics 58* , 665-675.

Anderson, G., & Bishop, R. (1986). The Valuation Problem. *Natural Resources Economics, Policy and Contemporary Analysis, Kluwer Nijhoff Publishing, USA*, 89-138.

Barbier, E. B. (1993). Sustainable use of wetlands valuing tropical wetland benefits: economic methodologies and applications. *The Geographical Journal, Vol. 159 No 1*, 22-32.

Barbier, E. B. (1994). Valuing Environmental Functions:Tropical Wetlands . *Land Economics, Vol 70, No 2* , 155-173.

Barbier, E. B., Acreman, M., & Knowler, D. (1997). Economic valuation of wetlands: A guide for policy and planners. *Ramsar Convention Bureau, Gland, Switzerland.*

Bateman, I.J., Carson, R.T., Day, B., Hanemann, M., Hanley, N., Hett, T., Jones-Lee, M., Loomes, G., Mourato, S., Ozdemiroglu, E., W.P, David, Sugden, R., & Swanson, J. (2002). *Economic Valuation with Stated*

Preference Techniques. Edward Elgar, Cheltenham, UK. Northampton, MA, USA.

Bennett, J., & Blamey, R. (2001). *The Choice Modelling Approach to Environmental Valuation.* Edward Elgar, Cheltenham, UK. Northampton, MA, USA.

Bergstrom, J. (1990). Concepts and Measures of the Economic Value of Environmental Quality: a Review. *Journal of Environmental Management 31*, 215-228.

Bergstrom, J. C., Stoll, J. R., & Randall, A. (1989). Information Effects in Contingent Markets. *American Journal of Agricultural Economics, Vol. 73, No 3*, 685-691.

Bishop, R. C., & Heberlein, T. A. (1979). Measuring Values of Extramarket Goods: Are Indirect Measures Biased? *American Journal of Agricultural Economics, Vol 61, No 5, Proceeding Issue*, 926-930.

Bowker, J., & Stroll, J. (1998). Use of Dichotomous Choice Non-market Methods to Value the Whooping Crane Resource. *American Journal of Agricultural Economics 70* , 372-381.

Boyle, K. J., Bishop, R. C., & Welsh, M. P. (1985). Starting Point Bias in Contingent Valuation Bidding Games. *Land Economics, Vol. 61, No 2*, 188-194.

Brander, L. M., Florax, R. J., & Vermaat, J. E. (2006). The empirics of wetland valuation: a comprehensive summary and a meta-analysis of the literature. *Environmental & Resource Economics 33*, 223-250.

Brown, T. C., Champ, P. A., Bishop, R. C., & McCollum, D. W. (1996). Which response format reveals the truth about donations to a public good? *Land Economics*, 72:152-66.

Calia, P., & Strazzera, E. (1998). Bias and Efficiency of Single vs Double Bounded Models for Contingent Valuation Studies: A Monte Carlo Anaysis. *Working Paper*, http://theses.gla.ac.uk/728/01/2009ahmandphd.pdf.

Cameron, T. A. (1988). A New Paradigm for Valuing Non-market Goods using Referendum Data: Maximum Likelihood Estimation by Censored Logistic Regression. *Journal of Environmental Economics and Management 15(1)*, 355-379.

Cameron, T. A., & James, M. D. (1987). Efficient Estimation Methods for "Closed-Ended" Contingent Valuation Surveys. *The Review of Economics and Statistics, Vol 69*, pp 269-276.

Capps, O., & Kramer, R. A. (1985). Analysis of Food Stamp Participation Using Qualitative Choice Models. *American Journal of Agricultural Economics 67*, 49-59.

Carlsson, F., Frykblom, P., & Liljenstolpe, C. (2003). Valuing Wetland Attributes: An Application of Choice Experiments. *Ecological Economics 47* , 95-103.

Carson, R. T. (1998). Valuation of Tropical Rainforests: Philosophical and Practical Issues in the use of Contingent Valuation. *Ecological Economics 24* , 15-29.

Carson, R. T., Flores, N. E., & Meade, N. F. (2001). Contingent Valuation: Controversies and Evidence. *Environmental and Resource Economics 19* , 173-219.

Ciriacy-Wantrup, S. (1947). Capital returns from soil conservation practices. *Journal of Farm Economics*, 29:1181-96.

Clawson, M. (1959). Methods of Measuring Demand for and Value of Outdoor Recreation Reprint No 10. *Resource for the Future Press, Washingston, DC.*

Cowardin, L. M., Carter, V., Golet, F. C., & LaRoe, E. T. (1979). Classification of Wetlands and Deepwater Habitats of the United States. *U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.*, 131 pp.

Dahl, T. E. (2000). Status and Trends of Wetlands in the Conterminous United States 1986 to 1997 . *U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.* , 82 pp.

Dahl, T. E. (2006). Status and Trends of Wetlands in the Conterminous United States 1998 to 2004 . *U.S. Department of the Interior, Fish and Wildlife Services, Washington, D.C.* , 112 pp.

Davis, R. (1963). The Value of Outdoor Recreation: An Economic Study of the Marine Woods. *Unpublished doctoral dissertation, University of Havard, USA*.

Dayang Affizah, A. M., Alias, R., & Siti Baizura, J. Z. (2007). The Economics of Recreational Park Conservation: A Case Study of Bako National Park. *The ICFAI Journal of Environmental Economics V(1)*, 44-56.

de Groot, R. (1992). *Functions of nature: Evaluation of Nature in Environmental Planning, Management and Decision Making.* Wolters Noordhoff BV, Groningen: The Netherlands.

de Groot, R., Stuip, M., Finlayson, M., & Davidson, N. (2006). *Valuing wetlands: guidance for valuing the benefits derived from wetland ecosystem services.* Ramsar Technical Report No 3/CBD Technical Series No. 27.: Ramsar Convention Secretariat, Gland, Switzerland & Secretariat of the Convention on Biological Diversity, Montreal, Canada. ISBN 2-940073-31-7.

Deparment of Fisheries. (DOF, 2013). *Fisheries Act 1985*. Retrieved from Deparment of Fisheries Malaysia: http://www.dof.gov.my/en/fisheries-act-1985

Department of Environmental Quality. (2013, June 23). *Wetlands Protection*. Retrieved from Michigan.gov: http://www.michigan.gov/deq/0,4561,7-135-3313_3687-10801--,00.html

Department of Wildlife and National Parks. (DWNP, 2007). *2007 Annual Report.* Malaysia: Department of Wildlife and National Parks Peninsular Malaysia.

Department of Wildlife and National Parks. (DWNP, 2011). *Paya Indah Wetlands*. Retrieved February 3, 2012, from Department of Wildlife and National Parks: http://www.wildlife.gov.my/index.php/en/functionsactivities/ecotourism/602

Desvousges, W., Johnson, F., Dunford, R., Boyle, K., Hudson, S., & Wilson, N. (1993). Measuring natural resource damages with contingent valuation: tests of validity and reliability. In: Hausman JA, editor. Contingent valuation: a critical assessment . *Amsterdam: North Holland* , p.91-159.

Dudenhoefer, D. (2002, November 5). *Community Ecotourism in Malaysia's Largest Wetlands*. Retrieved October 11, 2010, from Environment News Service: http://www.ens-newswire.com/ens/nov2002/2002-11-05-02.html

Emerton, L. (1998). Economic tools for valuing wetlands in eastern Africa . *Nairobi: International Union for the Conservation of Nature* .

Foster, V., & Mourato, S. (2002). Testing for Consistency in Contingent Ranking Experiments . *Journal of Environmental Economics and Management 44*, 309-328.

Garrod, G., & Willis, K. (1992). Valuing Goods' Charateristics: an Application of the Hedonic Price Method to Environmental Attributes. *Journal of Environmental Management 34*, 59-76.

Gaur, A. S., & Gaur, S. S. (2006). *Statistical Methods for Practice and Research: Guide to Data Analysis using SPSS.* New Delhi: Response Books.

Ghani. (2003, June 3). *We'll Save Tanjung Piai .* Retrieved January 9, 2012, from The Star Online : http://www.ecologyasia.com/news-archives/2003/jun-03/thestar_20030603_2.htm

Gujarati, D. N. (2006). *Essentials of Econometrics Third Edition .* New York : McGraw-Hill.

Gurluk, S., & Rehber, E. (2008). A Travel Cost Study to Estimate Recreational Value for a Bird Refuge at Lake Manyas, Turkey. *Journal of Enviornmental Management 88*, 1350-1360.

Hall, J. V., Frayer, W., & Wilen, B. O. (1994). *Status of Alaska Wetlands.* Anchorage, Alaska: U.S. Fish and Wildlife Service Alaska Region.

Hanemann, W. M. (1984). Welfare Evalutions in Contingent Valuation Experiments with Discrete Responses. *American Journal of Agricultural Economics* , 66:332-341.

Hanemann, W. M. (1991). "Willingness to Pay and Willingness to Accept: How Much Can They Differ?". *The American Economic Review, Vol 81, No 3*, pp 635-647.

Hanemann, W. M. (1994). Valuing the Environment Through Contingent Valuation. *Journal of Economic Perspectives 8(4)*, 19-43.

Hanemann, W. M., Loomis, J., & Kanninen, B. (1991). Statistical Efficiency of Double-Bounded Dichotomous Choice Contingent Valuation. *American Journal of Agricultural Economics*, 73: 1255-1263.

Hanley, N., & Barbier, E. (2009). *Pricing Nature: Cost-Benefits Analysis and Environmental Policy.* Edward Elgar, Cheltenham, UK. Northampton, MA, USA.

Hodkinson, R. (2004). Study on the Environmental Impact of Increasing the Supply of Housing in the UK. *Department of Environment Food and Rural Affairs* .

Huo, L., Chen, Z., Zou, Y., Lu, X., Guo, J., & Tang, X. (2013). Effect of Zoige alpine wetland degradation on the density and fractions of soil organic carbon. *Ecological Engineering 51*, 287-295.

IPT-Asian Wetland Bureau . (1993). *Tasek Bera: The Wetland Benefits of the Lake System and Recommendations for Management.* Asian Wetland Bureau Publication no. 98.

Jakobsson, K. M., & Dragun, A. K. (1996). *Contingent Valuation and Endangered Species: Methodological Issues and Applications.* Chelteham: Edward Elgar Publishing.

Jamal, O., & Shahariah, A. (2003). The Economics of Wetlands Conservation: Case of Paya Indah Wetlands, Malaysia. *Paper presented at International Ecotourism Conference* (pp. 15-17). Bangi: Organized by SEAMEO-SEARCA and UPM.

Jones, N., Evangelinos, K., Halvadakis, C., Iosifides, T., & Sophoulis, C. (2010). Social factors influencing perceptions and willingness to pay for a market-based policy aiming on solid waste management. *Resources, Conservation and Recycling 54*, 533-540.

Keddy, P. A. (2000). *Wetland Ecology Principles and Conservation.* United Kingdom: Cambridge University Press.

Kimmage, K., & Adams, W. (1992). Wetland Agricultural Production and River Basin Development in the Hadejia-Jama'are Valley, Nigeria. *The Geographical Journal, Vol158, No 1*, 1-12.

Kramer, R. A., & Mercer, D. (1997). Valuing a Global Environmental Good: U.S. Residents' Willingness to Pay to Protect Tropical Rain Forest. *Land Economics, Vol. 73, No 2* , 196-210.

Krutilla, J. V. (1967). Conservation Reconsidered . *The American Economic Review, Volume 57, Issue 4* , 777-786.

Leauthaud, C., Duvail, S., Hamerlynck, O., Paul, J-L., Cochet, H., Nyunia, J., Albergel, J., & Grunberger, O. (2013). Floods and livelihoods: The impact of changing water resources on wetland agro-ecological production systems in the Tana River Delta, Kenya. *Global Environmental Change 23*, 252-263.

Lee, C.-K., & Han, S.-Y. (2002). Estimating the Use and Preservation Values of National Parks' Tourism Resources Using a Contingent Valuation Method. *Tourism Management 23*, 531-540.

Leong, P. C., Zakaria, M., Ghani, A. N., & Mohd, A. (2005). Contingent Valuation of a Malaysian Highland Forest: Non-market Benefits Accrued to Local Residents. *Journal of Applied Sciences 5 (5)*, 916-919.

Leschine, T. M., Wellman, K. F., & Green, T. H. (1997). *The Economic Value of Wetlands: Wetlands' Role in Flood Protection in Western Washington.* Washington State Department of Ecology, Bellevue, Washington: Ecology Publication No 97-100.

Lindberg, K. (1991). *Policies for maximizing nature tourism's ecolgical and economic benefits. International Conservation Financing Project Working Paper.* Washington, D.C., U.S.A: World Resources Institute.

Loomis, J. (2002). *Intergrated Public Lands Management: Principles and Applications to National Forests, Parks, Wildlifes Refuges, and BLM Lands.* New York: Columbia University Press.

Maltby, E., & Barker, T. (2009). *The Wetlands Handbooks.* UK: Wiley-Blackwell.

Mills, A. S., Massey, J. G., & Gregersen, H. M. (1980). Benefit-Cost Analysis of Voyageurs National Park. *Evalution Review 4* , 715-738.

Ministry of Natural Resources and Environment. (NRE, 2011). *Paya Indah Wetlands*. Retrieved from Ministry of Natural Resources and Environment: http://www.nre.gov.my/English/Ecotourism/Pages/PayaIndahWetlandsEN.aspx

Mitchell, R., & Carson, R. (1984). *A Contingent Valuation Estimate of National Freshwater Benefits: Technical Report to the U.S. Environmental Protection Agency.* Washington, DC: Resources for the Future.

Mitchell, R., & Carson, R. (1989). *Using Surveys to Value Public Goods: The Contingent Valuation Method.* Washington DC, USA: Resources for the Future.

Mitsch, W., & Gosselink, J. (2007). *Wetlands, 4th ed.* New York : John Wiley & Sons.

Mmopelwa, G., & Blignaut, J. (2006). The Okavango Delta: the value of tourism. *South African Journal of Economic and Management Science 9(1)*, 113-127.

Mmopelwa, G., Blignaut, J., & Hassan, R. (2009). Direct use values of selected vegetation resources in the Okavango Delta Wetland. *South African Journal of Economic and Management Sciences 12(2)*, 242-255.

Mohd Aswad, R., Alias, R., Mohd Rusli, Y., & Noor Azlin, Y. (2011). Willingness to Pay towards the Sustainability of Forest Research Institute Malaysia's (FRIM's) Canopy Walkway. *International Journal of Business, Management and Social Sciences, Vol. 2, No 3*, 85-92.

Mohd Rusli, Y., Alias, R., & Shuib, A. (2009). A Contingent Valuation Study of Marine Parks Ecotourism: The Case of Pulau Payar and Pulau Redang in Malaysia. *Journal of Sustainable Development, Vol 2, No 2*, 95-105.

Murugadas, TL (Compiler) . (2002). Developing a proposed framework for a Wetland Inventory, Assessment and Monitoring System (WIAMS) in Malaysia . *Proceedings of the Workshop on Developing a Proposed Framework for a Wetland Inventory, Assessment and Monitoring System (WIAMS) in Malaysia, Sundari R, Davies J and Humphrey C (eds) .* Petaling Jaya: Wetlands International-Malaysia Programme .

NOAA. (2013, June 22). *Coastal Zone Management Act*. Retrieved from NOAA office of ocean and coastal resource management: http://coastalmanagement.noaa.gov/czm/czm_act.html

NOAA. (2014, August). *Coastal Services Center*. Retrieved from Environmental Valuataion: Principles, Techniques, and Applications: http://www.csc.noaa.gov/archived/coastal/economics/envvaluation.htm

Nuva, R., Shamsudin, M. N., Alias, R., & Shuib, A. (2009). Willingness to Pay towards the Conservation of Ecotourism Resources at Gunung Gede Pangrango National Park, West Java, Indonesia. *Journal of Sustainable Development*, 173-186.

Pate, J., & Loomis, J. (1997). The Effect of Distance on Willingness to Pay Values: A Case Study of Wetlands and Salmon in California. *Ecological Economics 20* , 199-207.

Pearce, D. W. (1993). *Economic Valuation and the Natural World.* London: Earthscan Publication.

Portney, P. R. (1994). The Contingent Valuation Debate: Why Economists Should Care. *Journal of Economic Perspective, Vol 8, No 4* , 3-17.

Rajpar, M., & Zakaria, M. (2010). Density and Diversity of Water Birds and Terrestrial Birds at Paya Indah Wetland Reserve, Selangor Peninsular Malaysia. *Journal of Biological Sciences 10 (7)* , 658-666.

Ramsar Convention Official Website. (2011). Retrieved from www.ramsar.org

Ramsar Convention Secretariat and UNWTO. (2012). *Destination wetlands: supporting sustainable tourism.2012.* Sectretariat of the Ramsar Convention on Wetlands, Gland, Switzerland, & World Tourism Organization (UNWTO), Madrid, Spain: http://www.ramsar.org/pdf/cop11/tourism-publication/Ramsar_UNWTO_tourism_E_Sept2012.pdf.

Ramsar Convention Secretariat. (2013, June 24). Wetlands Tourism Case Studies. Retrieved from Ramsar Convention: http://www.ramsar.org/cda/en/ramsar-activities-tourism-casestudies/main/ramsar/1-63-523-525_4000_0__

Randall, A., Ives, B., & Eastment, C. (1974). Bidding Games for Valuation of Aesthetic Environmental Improvements. *Journal of Environmental Economics and Management 1*, 132-149.

Rees, J., & Tivy, J. (1978). Recreational Impact on Scottish Lochshore Wetlands. *Journal of Biogeography 5*, 93-108.

Reinelt, L., Horner, R., & Azous, A. (1998). Impacts of urbanization on palustrine (depressional freshwater) wetlands - research and management in the Puget Sound region. *Urban Ecosystems*, 2,219-336.

Rolfe, J., Bennett, J., & Louviere, J. (2000). Choice Modelling and its Potential Application to Tropical Rainforest Preservation. *Ecological Economics 35* , 289-302.

Schuyt, K. D. (2005). Economic consequences of wetland degradation for local populations in Africa . *Ecological Economics 53*, 177-190.

Sekaran, & Uma. (1992). *Research Methods for Business: A Skill Building Approach (2nd Ed.).* Singapore: John Wiley& Sons Inc.

Shackleton, C., Timmermans, H., Nongwe, N., Hamer, N., & Palmer, N. (2007). Direct-use value of non-timber forest products from two areas on the Transkei Wild Coast . *Agrekon, Vol 46, No 1*, 135-156.

Sorg, C. F., & Nelson, L. J. (1987). Net Economic Value of Waterfowl Hunting in Idaho. *Resource Bulletin RM-14, Fort Collins, CO:USDA Forest Service*.

Spash, C. L. (2000). Ecosystems, Contingent Valuation and Ethics: The Case of Wetland Re-creation. *Ecological Economics 34* , 195-215.

Starbuck, C. M., Alexander, S. J., Berrens, R. P., & Bohara, A. K. (2004). Valuing Special Forest Products Harvesting: A two-step Travel Cost Recreational Demand Analysis. *Journal of Forest Economics 10* , 37-53.

Stuip, M., Baker, C., & Oosterberg, W. (2002). *The Socio-economics of Wetlands.* Wetlands International and RIZA: The Netherlands.

The International Ecotourism Society. (TIES, 1990). *What is Ecotourism.* Retrieved May 15, 2012, from http://www.ecotourism.org/what-is-ecotourism

Tietenberg, T. (2003). *Environmental and Natural Resource Economics, 6th edition.* United States of American : Pearson Eduction, Inc .

Togridou, A., Hovardas, T., & Pantis, J. D. (2006). Determinants of Visitors' Willingness to Pay for the National Marine Park of Zakynthos, Greece. *Ecological Economics 60*, 308-319.

Turner, K. (1991). Economics and Wetland Management. *Environmental Economics Vol 20, No 2*, 59-63.

Turner, R. K., Bergh, J. C., Soderqvist, T., Barendregt, A., Straaten, J. v., Maltby, E., & Ierland, E. C. (2000). Ecological-economic analysis of wetlands: scientific intergration for management and policy. *Ecological Economic 35*, 7-23.

Turner, R., & Brooke, J. (1988). Management and Valuation of an Environmentally Sensitive Area: Norfolk Broadland, England - case study. *Environmental Management 12*, 193-207.

Venkatachalam, L. (2004). The contingent valuation method: a review. *Environmental Impact Assessment Review 24*, 89-124.

Wang, X., Bennett, J., Xie, C., Zhang, Z., & Liang, D. (2007). Estimating Non-market Environmental Benefits of the Conversion of Cropland to Forest and Grassland Program: A Choice Modelling Approach. *Ecological Economics 63*, 114-125.

Ward, F. A., & Beal, D. (2000). *Valuing Nature with Travel Cost Models.* Edward Elgar, Cheltenham , UK. Northampton, MA, USA.

Wetlands International. (2010). *A Quick Scan of Peatlands in Malaysia.* Wetlands International-Malaysia: Petaling Jaya, Malaysia. 50 pp.

Wetlands International. (2011). *Wetlands for Water and Life*. Retrieved October 11, 2011, from Wetlands International:

http://www.wetlands.org/Aboutus/Whatarewetlands/Threatenedwetlandsites/TanawetlandsinKenya/tabid/1353/Default.aspx

Wetlands International Malaysia. (2013, June 28). Retrieved from http://malaysia.wetlands.org/

Wetlands International Malaysia. (2012). *Threatened Wetlands that Deserve our Attention*. Retrieved January 9, 2012, from Wetlands International Malaysia: http://www.malaysia.wetlands.org/OurWetlands/Threatenedwetlandsthatdeserveourattention/tabid/507/Default.aspx

White, P. C., & Lovett, J. C. (1999). Public Preferences and Willingness-to-pay for Nature Conservation in the North York Moors National Park, UK. *Journal of Environmental Management 55*, 1-13.

Whittington, D., Smith, V. K., Okorafor, A., Okore, A., Liu, J. L., & Mcphail, A. (1992). Giving Respondents Time to Think in Contingent Valuation Studies: A Developing Country Application. *Journal of Environmental Economics and Management 22*, 205-225.

Williams, M. (1990). *Wetlands: A Threatened Landscape.* Oxford : Blackwell.

WWF Malaysia . (2012, August 15). *Project: Sustainable Management of Setiu Wetlands*. Retrieved August 15, 2012, from WWF Malaysia: http://www.wwf.org.my/about_wwf/what_we_do/freshwater_main/freshwater_conserving_freshwater_habitats/projects_sustainable_management_of_setiu_wetlands/

Yasak, M. N. (1996). *Development of Ecotourism in Malaysia*. Retrieved May 15, 2012, from http://www.unescap.org/ttdw/Publications/TPTS_pubs/pub_1748/pub_1748_TP-G.pdf

Yusuf, A. A., & Resosudarmo, B. P. (2009). Does Clean Air Matter in Developing Countries' Megacities? A Hedonic Price Analysis of the Jakarta Housing Market, Indonesia. *Ecological Economics 68*, 1398-1407.

Zaiton, S. (2008). Willingness to Pay in Taman Negara: A Contingent Valuation Method. *International Journal of Economics and Management 2(1)*, 81-94.

Zakaria, M., Rajpar, M., & Sajap, A. (2009). Species Diversity and Feeding Guilds of Birds in Paya Indah Wetland Reserve, Peninsular Malaysia. *International Journal of Zoological Research 5(3)*, 86-100.