



UNIVERSITI PUTRA MALAYSIA

**ENVIRONMENTAL ATTITUDES AND
WILLINGNESS TO PAY FOR HIGHLAND CONSERVATION:
THE CASE OF FRASER'S HILL, MALAYSIA**

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WILLINGNESS TO PAY FOR HIGHLAND CONSERVATION:
THE CASE OF FRASER'S HILL, MALAYSIA**

By

PUAN CHONG LEONG

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

February 2005



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

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Highlands are fragile ecosystem crucial for various human necessities, especially in terms of biodiversity, water supply, climate moderator and soil conservation. Losing this precious heritage means that we are losing our long-term revenue from various tangible as well as intangible goods and services. Unless the wildlife particularly birds and the highland ecosystem can be shown to have real and substantial value, decisions are often made in favour of alternative land uses such as residential development and agricultural practices. Therefore, a full and accurate economic valuation of natural resources in particular non-marketable goods is needed. A social survey was conducted in order to capture the value that people placed and their attitudes towards the protection of Fraser's Hill as a habitat for bird population. A total of 435 respondents comprising on-site visitors and residents were randomly selected. The results indicated that the majority of respondents have positive attitudes towards wildlife protection. They realized that human presence and habitat loss are major wildlife threats, and more priority should be given on wildlife protection instead of tourism in terms of government



funding. In addition, they also recognized the importance of habitat protection. The responses were associated with respondents' socio-economic backgrounds including age, education level and income. The value to protect Fraser's Hill for birds was estimated using Contingent Valuation Method. The results indicated that the conservation value of Fraser's Hill for birds is RM30.33 and RM12.25 annually per visitor and resident, respectively. Results showed that the protection of highlands is essential in terms of various values that should be recognized and taken into consideration in policy making associated with highlands development.

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

**SIKAP DAN KESANGGUPAN MEMBAYAR
TERHADAP PEMULIHARAAN TANAH TINGGI:
KAJIAN KES DI BUKIT FRASER, MALAYSIA**

Oleh

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Tanah tinggi adalah ekosistem mudah terancam yang amat penting kepada pelbagai keperluan manusia, terutamanya dari segi kepelbagaian biologi, bekalan air, penyelarasan iklim dan pemuliharaan tanah. Kehilangan khazanah yang amat bernilai ini bermakna kita akan kehilangan hasil jangka masa panjang daripada pelbagai barangan dan perkhidmatan yang ternilai dan sukar untuk dinilai. Melainkan ditunjukkan bahawa hidupan liar terutamanya burung-burung dan ekosistem tanah tinggi mempunyai nilai yang sebenar, keputusan yang dibuat lazimnya akan berpihak kepada penggunaan tanah yang alternatif seperti pembangunan perumahan dan pengusahaan pertanian. Oleh yang demikian, satu penilaian ekonomi yang menyeluruh dan tepat ke atas sumber-sumber semulajadi terutamanya barangan yang tidak diniagakan adalah diperlukan. Satu survei sosial telah dijalankan untuk menentukan nilai yang diberi oleh orang ramai serta sikap mereka terhadap perlindungan Bukit Fraser sebagai suatu habitat kepada populasi burung. Sebanyak 435 responden yang merangkumi pengunjung semasa dan penduduk telah dipilih secara rawak. Keputusan menunjukkan bahawa majoriti



daripada responden mempunyai sikap positif terhadap perlindungan hidupan liar. Mereka menyedari tentang kehadiran manusia dan kemusnahan habitat sebagai ancaman utama kepada hidupan liar, dan keutamaan yang lebih perlu diberi kepada perlindungan hidupan liar daripada pelancongan dari segi peruntukan kewangan kerajaan. Tambahan pula, mereka juga mengakui tentang kepentingan terhadap perlindungan habitat. Jawapan yang diberi adalah berkaitan dengan latar belakang sosio-ekonomi responden termasuk umur, tahap pendidikan dan pendapatan. Nilai untuk melindungi Bukit Fraser untuk burung-burung telah dianggarkan dengan menggunakan Kaedah Penilaian Kontingen. Keputusan menunjukkan bahawa nilai pemuliharaan bagi Bukit Fraser untuk burung-burung adalah masing-masing sebanyak RM30.33 dan RM12.25 setahun per pengunjung dan penduduk. Maka, dapat diputuskan bahawa perlindungan tanah-tanah tinggi adalah penting dari segi nilai-nilai yang harus diiktirafkan dan diambilkira dalam pembentukan polisi yang berkaitan dengan pembangunan tanah tinggi.

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I certify that an Examination Committee met on 25th February 2005 to conduct the final examination of Puan Chong Leong on his Master of Science thesis entitled “Environmental Attitudes and Willingness To Pay for Highland Conservation: The Case of Fraser’s Hill, Malaysia” in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

PUAN CHONG LEONG

Date: 25th February 2005



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LIST OF ABBREVIATIONS

CS	Compensating surplus
CV	Compensating variation
CVM	Contingent Valuation Method
DBDC	Double-bounded dichotomous choice
EIA	Environment Impact Assessment
ES	Equivalent surplus
EV	Equivalent variation
FHDC	Fraser's Hill Development Corporation
FHNEC	Fraser's Hill Nature Education Centre
IBA	Important Bird Area
KKB	Kuala Kubu Bharu
MNS	Malaysian Nature Society
NGO	Non-governmental organization
NOAA	National Oceanic and Atmosphere Administration
OLS	Ordinary least squares
SAM	Sahabat Alam Malaysia
TCM	Travel Cost Method
TEV	Total economic value
WI	Wetland International
WLS	Weighted least squares
WTP	Willingness to pay/ willing to pay
WTA	Willingness to accept/ willing to accept
WWF/ WWFM	World Wide Fund for Nature Malaysia



CHAPTER 1

INTRODUCTION

1.1 General Background

In the tropical countries, highland areas are great recreational retreats especially for urban dwellers. This is mainly due to the physical attractions of lush greenery, forested ridges, hillcrests and waterfalls in the areas. In addition, the combination of these natural characteristics is an environment that provides psychological and social services such as tranquility, peacefulness, and natural scenery, coupled with coolness and mild climate.

Fraser's Hill is currently a popular hill resort, which was initially developed as a hill station by the British Malaya Administration in 1919. Since it was the British that first developed the area, the area is in a unique position due to its English heritage, and desires to maintain this, a typical English village with intact vegetation and English-like buildings, which conforms to a village image, not a township (Lim, 1995).

The area is also noted for its biodiversity. Surrounded by montane forests, it provides a vital habitat for many species of flora and fauna including some of the endangered and endemic species. For instance, of 835 species of flowering plants surveyed at Fraser's Hill, 13 (1.6%) species has extinct since the hill station was



developed in the 1920s and 103 (12.4%) are now placed under rare or endangered (Kiew, 1997).

The diversity of fauna in the area is recognized with the prime event of International Bird Race, which has been held annually since 1988. Its current status as a bird sanctuary was bestowed in the 1950s (Lim, 1995). About 263 avian species have been sighted in and around the area, which considers as one of the highest counts of montane birds in the region. Fraser's Hill is currently a prime birdwatching spot in the country, and attracts many keen nature enthusiasts.

The combination of natural environment, biodiversity and historical heritage with foreign alike surroundings play an important role as the major attractions of Fraser's Hill. It is undeniable that the potential is already there for Fraser's Hill as an ecotourism destination. Realizing the uniqueness and identity of the area, the primary consideration should be given on the unique environment and bird sanctuary, and concentrate efforts on promoting the appreciation of these assets, rather than developing artificial alternatives, which will cause adverse impacts to the environment.

As already evidenced by the construction of second access road and golf course in addition to the existing ones, tree felling and land clearing for these projects is already causing environmental damage. There has been detectable climate change, and the scenery has been spoilt, in addition to noise and air pollution from the heavy vehicles (Lim, 1995; Kiew, 1997). Jeriau Waterfall, one of the visiting spot



has been silting up and becoming polluted. Moreover, the decline in bird numbers as a result of habitat disturbance has also been reported (Noramly and Yeap, 2001).

Basically, many will think that development in the area would be beneficial as it attracts more people, improves facilities and infrastructure and fulfills the needs of visitors. But development actually destroys the reason people come in the first place. Development seems to affect the environment adversely as new areas are encroached, and irreparable damage occurs to the ecology. Furthermore, development might attract many non-nature oriented visitors to the area and consequently causing the increase in traffic, pollution, noise and litter problems and certainly the decrease in enjoyment of the place.

Fraser's Hill is one of the three hill resorts located on the Main Range of Peninsular Malaysia. It is the least developed by comparing to its counterparts Cameron Highlands and Genting Highlands. They have engaged in extensive agriculture activities and massive development. As already demonstrated in many instances, improper development on highlands has caused various impacts from hill station to downstream communities. There is a definite need to conserve and maintain the unique features in Fraser's Hill without following the path of other hill resorts. Hence, a proper assessment of the environmental goods and services provided by the highlands is essential in avoiding irrational decision associated with these precious resources.



1.2 Research Problem

The current environmental issues such as landslides, water shortages and floods are demonstrating that the ecological carrying capacity of highlands has been exceeded. Highlands are facing a shift in its ecological balance due to conversion of these areas to other land uses. Many highland areas are under constant threats from indiscriminate land clearing not only for resorts and residential development but also from agriculture activities and timber extraction.

Alternative land uses often cause the loss and fragmentation of habitat that reduce or eliminate wildlife populations. By consequence, the opportunities in doing wildlife-based activities are also reduced. In addition, losing these natural resources also means that we are losing the long-term revenue from bioprospecting for medicinal plants, new crops and eventually the function of whole ecosystem. Apparently, the effects of mistaken decisions are permanent and potentially substantial. If all these opportunities are no longer exist due to development, certainly there will be a loss in terms of social welfare.

The importance of highlands certainly cannot be denied. Any further development in these environmentally sensitive areas will bring about further degradation not only in the hill stations but also affect downstream communities. Tax money will eventually go towards remedial works caused by the loss of highlands and other negative impacts from upstream development. For instance, the hydroelectric dam at Ringlelet, Cameron Highlands, has been suffered from severe siltation due to

upstream development, which costs RM1 million annually in station shutdowns and RM0.25 million for silt removal, and the working life of the dam has been halved (Kiew, 1997). Perhaps all these incidents are symptoms of a weakness in planning systems on highlands development.

In the case of Fraser's Hill, the abundance of birds has provided a basis for recreational experiences. The area has been considered as one of the best places in Asia to observe birds including some of the rare forest specialists (Strange, 2004). More than 260 species of birds have been recorded. This includes one Malaysian endemic, 83 Sunda endemics and 36 globally threatened species (Noramly and Yeap, 2001; Strange, 2004). Besides that, the relatively undisturbed forests also serve as a crucial transit point for the birds migrating from northern hemisphere. At about 1,300 metres above sea level, Fraser's Hill provides an easier route for the migratory birds, as it is relatively lower than other hill resorts in the peninsula. There are at least 64 migratory species recorded from the area. The significance of Fraser's Hill as a bird habitat is recognised with its inclusion under BirdLife International criteria as an Important Bird Area (IBA) (Noramly and Yeap, 2001). In relation, it is currently the only venue in the country for the International Bird Race that has been held annually since 1988.

However, unlike most consumer goods, forest birds do not hold any price in a market, and their value to the society and the forests needed in supporting the bird population generally go unmeasured. Besides that, there is currently no entrance fees being charged or limitation to the access point and thus no incentive to reveal



how much the benefits that the users gained by visiting the area. In this case, even though a pristine natural area like Fraser's Hill may be socially beneficial, this does not warrant continuous provision and protection of such area because most of the benefits are underestimated. As a result, highlands are subject to various development tradeoffs. The highland ecosystem is often removed and converted to an entirely different land use. Species that are highly vulnerable to habitat loss would certainly be forced to the verge of extinction. In addition to biodiversity loss, irreversible changes may also result in a loss of various intangible values of highland resources.

Unless the natural resources such as montane birds and the highland ecosystem can be shown to have real and substantial value, decisions would be often made in favour of alternative land uses. An example of such alternative land uses that requires careful consideration would be the Highland Highway proposal, which was announced in 1994. The idea is to construct a 200-kilometre road at an elevation of 1000 metres above sea level that will connect the three prime hill resorts, namely Cameron Highlands, Fraser's Hill and Genting Highlands (Figure 1.1). The project will not only open up forests cover that are rich in biodiversity, but also cut across most of the headwater catchments, disturb the rainfall regime and alter the temperature. While development in the highlands has been localized so far, the proposed highway would affect much wider areas beyond the highlands with far-reaching consequences (Anon., 1997; Louis, 1997; Anon., 2000).

Realizing the uncertainties and irreversible consequences when altering ecosystems, several questions have been raised. Should these highland areas be preserved intact as wildlife refuges, or be exploited for direct yet short-term profits? How can the society make the best decisions about how to allocate these precious and scarce resources to conservation?

Hence, government and the relevant management authorities should be acknowledged the significance of protecting highland areas. Perhaps one way to accomplish this goal is through the use of economic valuation. Once the importance of highlands for instance, as critical habitat has been properly valued in monetary units, they become amenable to standard cost and benefit comparisons. This will not only help in justifying the protected status, but the management authorities can also fight for larger budget allocations to improve their management capabilities. Conservation or restoration projects can be prioritised. On the other hand, a more comprehensive compensation framework can be prepared for environmental damages or impacts involved when development project is being implemented.

In addition, economic valuation would be a promising approach, as it includes a broad range of societal concerns about environmental values into policy decisions. While economic benefits are useful to generate political support, the relevant public attitudes and motives obtained from such approach can in turn further aid conservation. Only through the understanding of public's attitudes towards the management and protection of natural resources will the government and the

relevant management authorities successfully confront these challenges. In relation, understanding and incorporating these attitudes into planning efforts is essential in developing effective information, communications, programs and strategies. In addition, the people's perception of what should be conserved can be turned to the advantage of many species including the lesser-known and rare species, as in the case of Fraser's Hill.

1.3 Objectives

The general objective of the study was to estimate the conservation value of Fraser's Hill as a bird habitat by using Contingent Valuation Method (CVM). The specific objectives of the study were:

1. To examine people's attitudes towards Fraser's Hill for wildlife protection with special reference for birds,
2. To determine factors that influence people's willingness to pay for the protection of Fraser's Hill, and
3. To estimate the conservation value of Fraser's Hill as placed by visitors and residents