ECOTOURISM POTENTIALS IN MALAYSIA

Faculty of Forestry
Universiti Putra Malaysia

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FOREWORD

Assalamualaikum w.b.t. and salam sejahtera.

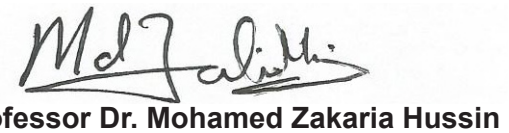
Once again the Faculty of Forestry, Universiti Putra Malaysia (UPM) has successfully organized the 2nd. International Conference on Adventure and Ecotourism 2015. It was held at Adya Hotel, Langkawi Island with the theme of Conservation, Education, Enforcement and Responsible Management through Adventure and Ecotourism. The theme was chose because it is about time that conservation, education, enforcement and responsible management to be highlighted as the significant elements through adventure and ecotourism activities. It means in any adventure and ecotourism activities done not only the monetary value should be focus on but instead in any adventure and ecotourism activities the operators, stakeholders and visitors must be aware about the importance of conservation, education, enforcement and responsible management to protect and sustain a destination and surrounding area.

The Faculty of Forestry through its Department of Recreation and Ecotourism as the main organiser of this conference hoping to create awareness that adventure and ecotourism activities can be the agent for conservation, education, enforcement and responsible management in the tourism industry. By organising this conference where the academicians, NGOs and practitioners gathered at one place and at one time everyone can share their knowledge and ideas which will give benefit towards the development of adventure and ecotourism sectors particularly in Malaysia.

Hence, the publication of this second e-book will contribute more reliable data and information about the topics which hardly attract the attention of many tourism scholars although adventure and ecotourism activities are not something new in the tourism field. This e-book covers wide range of topics from hard science to social science on tourism topics. More contributions received from the authors who participated in the 2nd. ICAE 2015. It is indeed another great achievement for the organiser to be able to attract more participants and paper presented for the conference compared to the previous ICAE. This will help the organiser to build a strong brand for ICAE and in attracting more participants from all over the world in the future.

With the success publication of this e-book hopefully the Department of Recreation and Ecotourism, Faculty of Forestry will become the main reference centre in the field relating to adventure and ecotourism in Malaysia and worldwide. As the Dean of Faculty of Forestry, I would like to extend my gratitude to all authors in this e-book. Also, congratulations to the editorial team for the publication of the 2nd. e-book from the 2nd. ICAE 2015. Thank you and good luck to everyone.

“BERILMU BERBAKTI”



Professor Dr. Mohamed Zakaria Hussin
Dean
Faculty of Forestry
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PREFACE

International ecotourism conferences in Malaysia have often been organized by international organizers. In 2014, the Faculty of Forestry, University Putra Malaysia initiated the First International Conference on Adventure and Ecotourism (ICAE) 2014. The conference was held in December 2014 on Mount of Jerai, Kedah. The conference was organized to promote Malaysia as a unique country with diverse ecotourism destinations, products and resources that have been preserved for generations, particularly the new ecotourism products and services such as at Mount of Jerai. The conference also presents Malaysia as a chosen ecotourism destination for many international tourists and holidaymakers.

The positive support and feedback from the first conference has motivated the Faculty of Forestry, Universiti Putra Malaysia to commit towards the organizing of the conference on an annual basis. The second international conference was organized from 4-8 December 2015 on the island of Langkawi in Kedah. Known as the Langkawi International Conference on Adventure and Ecotourism (ICAE) 2015, the conference showcased Langkawi as an important adventure and ecotourism destination for both international and local tourists. The conference congregated academicians, researchers, practitioners and businesses in the field to exchange knowledge and experiences. Through the conference, we hope to reduce the gaps between the various sectors and encourage active collaboration towards establishing a tourism industry that is whole, creative and sustainable.

The conference garnered positive support and feedback from its participants and this has motivated the Faculty of Forestry, UPM to publish the papers presented during the conference in this book. This book consists of 22 papers that cover a wide range of research works related to the field of ecotourism. Therefore, the book is divided into 4 sections to provide you a glimpse into the various ecotourism studies conducted which ranged from empirical studies of wildlife and wildlife in ecotourism; ethno and cultural studies of ecotourism and recreation studies.

The Faculty of Forestry, UPM would like to extend our heartfelt gratitude to the Ministry of Tourism and Culture Malaysia for their support towards the organizing of the conference. We would also like to thank the presenters and participants of the conference and all those who had supported us in any ways in making the conference a success.

Manohar Mariapan
Evelyn Lim Ai Lin
Siti Suriawati Isa
Muhammad Shahrim Karim
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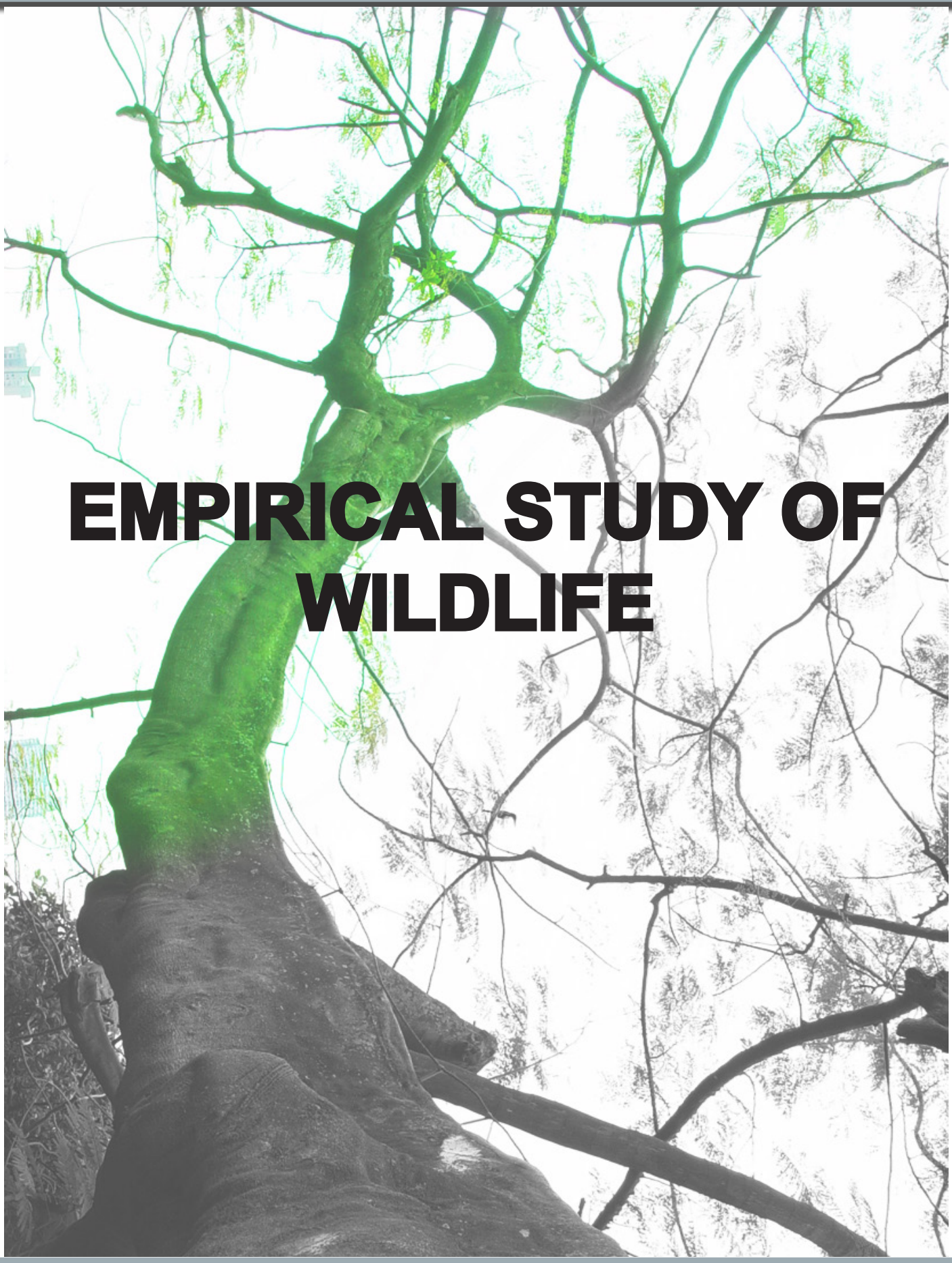

EMPIRICAL STUDY OF WILDLIFE

SUSTAINABLE TOURISM BOTANY IN PULAU PERHENTIAN

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ABSTRACT

Surrounded with a scenic view of the whitish beach along the coastal area and the extensive stands of forest, Pulau Perhentian offers both land and water based tourism activities. Pulau Perhentian is covered with natural stands of forest with diverse array of flora and fauna. Because of this, it is necessary to give way for the enhancement of scientific knowledge on the natural heritage among tourists and visitors. Trees that made up the forest are key for the availability of fauna and other formation of flora. Therefore, a study was conducted at Pulau Perhentian to provide a taxonomic list of the tree flora. Forest plot was applied in the study. A total of 52 species was recorded that comprised of 29 families based from the study. The finding is applicable for sustainable tourism in relation to the field of botany as well as wildlife as these two biotic elements is dependable on each other.

Keywords: Pulau Perhentian, sustainable tourism, botany and forest plot.

1. Introduction

Pulau Perhentian is known as one of the best tourism destination in Malaysia. As one of the island in the state of Terengganu, the island has fascinated tourists with its natural beauty since 1960s (Yap & Kahoru, 2001). Today, the development of resorts is expanding throughout the coastal areas of both Pulau Perhentian Kecil and Pulau Perhentian Besar. The island was gazetted as one of the Marine Parks in Malaysia for conservation purposes to assess the biodiversity of its water based resources (Jaafar & Maideen, 2012). Conservation effort is a gateway to promoting ecotourism based activities. Ecotourism is widely defined as a nature-based activity that involves learning and must be ecologically sustainable. However, the challenge lies in how to develop ecotourism based activities locally through the community living in the island, especially those with limited resources. Exploitation of the natural resources would affect the structural complexity of the forests and harm the availability of natural resources. Therefore, sustainable tourism that instil appreciation of nature and enhancement of scientific knowledge is suitable for the environment.

According to Coral Cay Conservation (2005), there are an estimate of 1,500 people living in the island based on the population census conducted in 1991 that recorded the population on the islands as 1,010 individuals. In Perhentian Kecil, the island is moderately developed with infrastructure such as a jetty, a primary school, a small health centre, some small restaurant and shops to complement human daily needs. Limited areas for development is available due to the steep slopes of the hills that is covered with extensive stands of forest. This results the island to concentrate more on more tourism activities based on being the biodiversity richness of the ocean.

Pulau Perhentian is covered with extensive stands of forests providing a sanctuary of fauna such as mammals, birds, insects, and lizards that mostly favoured the island ecosystem. Some shade of specific plants are available and scattered throughout the understory due to highly covered canopy of the forest. In such cases, the importance of the most crucial plant formations and trees are emphasized. As they were the major components that made up the forest canopy, animals strongly depend on the availability of the trees due to some direct reasons. The forest is home to the canopy dwelling animals and becomes an important source of food for the continuation of the living animals. This kind of interaction is essential in making a way towards land ecotourism on the island. For example, an effort to promote ecotourism as one of the ways to protect the rainforests and at the same time provides the chance for the local communities to explore other alternate sources of income in Indonesia (Tamindael, 2015). Studies on the island flora have been attempted by several researches (Latiff et al., 1999; Mahmud Khairil et al., 2013; Senterre et al., 2015). Therefore, an extensive study was done to provide a taxonomic list of the tree species at Pulau Perhentian Besar. The taxonomic list is useful to update the current tree species in the island and to identify the tree species favoured by the animals for food, shelter and protection especially for the highly protected wildlife.

2. Methodology

2.1. Sampling site

The forest inventory was done in the month of September, 2015 at Pulau Perhentian Besar. Two plots were established at different locations in Pulau Perhentian Besar. The first plot (N 05°53.243' E 102°44.505') was located on the hilly rocky site, of the island. Meanwhile, the second plot (N 05°53.291' E 102°44.474) was located at the front site, located about 100 meters from the coastal area.

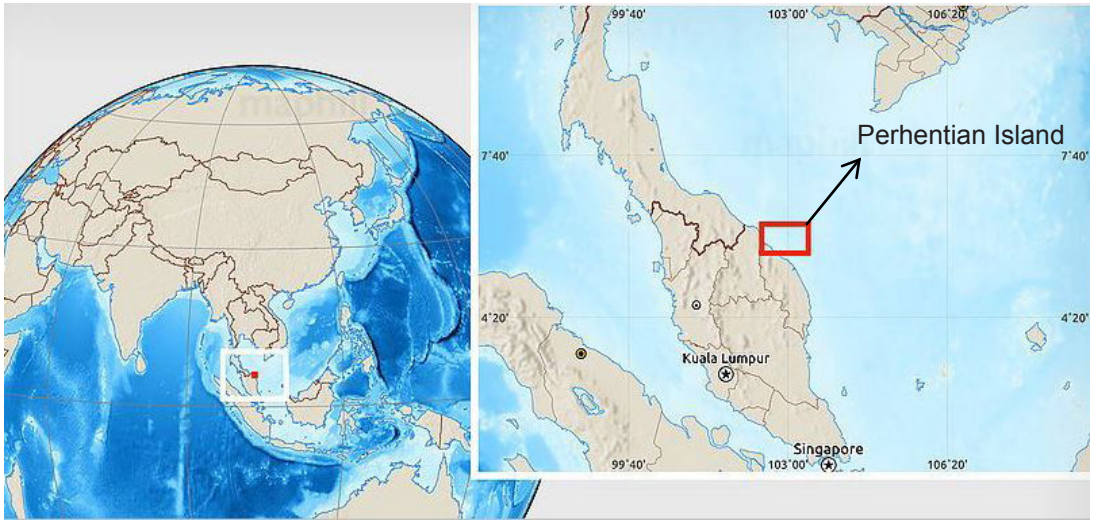

Figure 1 Map showing the location of Perhentian Island.
Source: Maphill.com

2.2. Vegetation

According to Coral Cay Conservation (2005), the island is a granite island spotted by hilly slopes linking the sea and granite tors bulging out forming cliffs and outcrops. Pulau Perhentian Besar is made up of virgin forests with the timber family, Dipterocarpaceae sp. such as Dipterocarpus and Shorea occupying the forests. Meanwhile, in Pulau Perhentian Kecil, the land has been altered. Therefore, the island is made up of pockets of primary forests at the steep hilly sites on the southern region surrounded by the secondary rainforests. However, extensive study centered at the Teluk Keke, Pulau Perhentian Besar revealed the main principal vegetation of the study site is an old secondary forest that covers the sandy rocky site near the coastal area until the hilly rocky area. The surrounding environment is covered with extensive stands of plants species that includes trees, climbers, palms and shrubs forming a dense forest floor and highly covered canopy providing a sanctuary of flora and fauna.

2.3. Plot Establishment

The establishment of plot has been conducted following Remi et al. (2012) in the conduct of developing a checklist of trees in the Crocker Range Park Permanent Research Plot in Sabah, Malaysia. The study utilizes the forest plot with a size of 50 metre (m) x 50 metre (m). The study utilizes the forest plot with a size of 50 metre (m) x 50 metre (m) and divided into four subplots of 25 metre (m) x 25 metre (m). All trees with 5 cm diameter breast height (dbh) and above were measured in terms of dbh and height. Identification of trees was done *in situ* while voucher specimen of every tree species was taken for further verification.

3. Results

A total of 52 tree species were recorded from a combination of two plots established in Pulau Perhentian, Terengganu. The trees represent 29 families and 40 genera with three species still in the process of identification. In plot 1 where the plot was established on the slope of a hilly rocky area of the island, it was found that the most abundant tree species was *Vatica cinerea* (Dipterocarpaceae), followed by *Syzygium cerinum* (Myrtaceae) and *Buchanania arborescens* (Anacardiaceae). Meanwhile, on the other plot established at the front hills that is located about 100 meters from the coastal area, *Cratoxylum formosum* (Hypericaceae) was found to be the most abundant, followed by *Chaetocarpus castanocarpus* (Euphorbiaceae) and *Vitex pinnata* (Verbenaceae) with only slight difference in the composition. The checklist of the overall tree species recorded is as shown in Table 1. Most of the trees in Plot 1 and Plot 2 have a DBH range within 5 until 25 cm and only a few of the trees reach up to 100 cm in dbh. Meanwhile, majority of the trees stands within the range of 3 to 13 meter in height and a small number reached till 27 meter. Details can be found in Figure 2 and Figure 3 respectively.

Table 1 Checklist on Tree Flora of Pulau Perhentian

Family	Species
Anacardiaceae	*Buchanania arborescens* (Blume) Blume
	*Parishia insignis*Hook.f.
Annonaceae	*Polyalthia sumatrana* (Miq.) Kurz.
Apocynaceae	*Cerbera* sp
Caesalpiniaceae	*Sindora wallichii*Grah. exBenth.
Calophyllaceae	*Mesua ferrea* L.
Celastraceae	*Euonymus cochinchinesis* Pierre.
Clusiaceae	*Garcinia nigrolineata* Planch. ex T. Anderson
Dipterocarpaceae	*Vatica cinerea* King.
Elaeocarpaceae	*Elaeocarpus* sp
	Elaeocarpus mastersii King.
Erythroxylaceae	*Erythroxylum cuneatum* (Miq.) Kurz
Euphorbiaceae	*Chaetocarpus castanocarpus* (Roxb.) Thwaites
	Baccaurea parviflora (Müll.Arg.) Müll.Arg.
	Koilodepes sp
Fabaceae	*Callerya atropurpurea* (Wall.) Schot.
Fagaceae	*Lithocarpus rassa* (Miq.) Rehder
Guttiferae	*Calophyllum rupicola*Ridl.
Hypericaceae	*Cratoxylum formosum* (Jack) Dyer.
Lecythidaceae	*Barringtonia macrostachya* (Jack) Kurz.
Meliaceae	*Aglaia* sp. 1
	Aglaia sp. 2
	Sandoricum koetjape (Burm.f.) Merr.
Moraceae	*Artocarpus scortechinii* King.
	Ficus sp
Myristicaceae	*Knema glauca* (Blume) Warb.
	Knema globularia (Lam.) Warb.
Myrsinaceae	*Rapanea porteriana* Wall. ex A. DC.
Myrtaceae	*Rhodamnia cinerea* Jack.
	Syzygium cerinum (M.R. Hend.) I.M. Turner.

	Syzygium sp. 2
	Syzygium sp. 5
	Syzygium sp. 1
	Syzygium sp. 6
	Syzygium sp. 3
	Syzygium sp. 4
	Adinandra dumosa Jack.
Rubiaceae	*Diplospora malaccensis*Hook.f.
	Morinda elliptica (Hook.f.) Ridl.
Rubiaceae	*Psydrax* sp.
	Timonius wallichianus (Korth.) Valeton.
Rubiaceae	*Ixora pendula* Jack var. pendula
Sapindaceae	*Guioa bijuga* (Hiern) Radlk.
	Nephelium sp
Sapotaceae	*Palaquium obovatum* (Griff.) Engl.
	Pouteria obovata (R.Br.) Baehni.
Simaroubaceae	*Eurycoma longifolia* Jack.
Symplocaceae	*Symplocos adenophylla* Wall. ex G. Don
Verbenaceae	*Vitex pinnata* L.
	Unidentified species 1
	Unidentified species 2
	Unidentified species 3
Total Species	**52**

Table 2 Tree species compositions in Plot 1.

Family	**Species**	**No of individuals**
Dipterocarpaceae	*Vatica cinerea* King.	71
Myrtaceae	*Syzygium cerinum* (M.R. Hend.) I.M. Turner.	63
Anacardiaceae	*Buchanania arborescens* (Blume) Blume	45
Symplocaceae	*Symplocos adenophylla* Wall. ex G. Don	37
Rubiaceae	*Psydrax* sp.	33
Myrtaceae	*Syzygium* sp.1	25
Euphorbiaceae	*Chaetocarpus castanocarpus* (Roxb.) Thwaites	22
Guttiferae	*Calophyllum rupicola* Ridl.	21
Myrtaceae	*Syzygium* sp. 2	11
Verbenaceae	*Vitex pinnata* L.	8
Leguminosae	*Callerya atropurpurea* (Wall.) Schot.	7
Sapotaceae	*Palaquium obovatum* (Griff.) Engl.	6

Elaeocarpaceae	*Elaeocarpus* sp.	4
Myrtaceae	*Syzygium* sp.5	4
Hypericaceae	*Cratoxylum formosum* (Jack) Dyer.	3
Myrsinaceae	*Rapanea porteriana* Wall. ex A. DC.	3
Myrtaceae	*Syzygium* sp.6	3
Sapindaceae	*Guioa bijuga* (Hiern) Radlk.	2
Myrtaceae	*Syzygium* sp. 3	2
Euphorbiaceae	Unidentified species 1	2
Fagaceae	*Lithocarpus rassa*(Miq.) Rehder	1
Myrtaceae	*Rhodamnia cinerea*Jack.	1
Myrtaceae	*Syzygium* sp.4	1
Total		375

Table 3 Tree Species Composition in Plot 2

Family	**Scientific Name**	**No of Individuals**
Hypericaceae	*Cratoxylum formosum* (Jack) Dyer.	14
Euphorbiaceae	*Chaetocarpus castanocarpus* (Roxb.) Thwaites	13
Verbenaceae	*Vitex pinnata* L.	10
Rubiaceae	*Morinda elliptica* (Hook.f.) Ridl.	9
Myrtaceae	*Syzygium* sp.	9
Leguminosae	*Callerya atropurpurea* (Wall.) Schot.	8
Rubiaceae	*Psydrax* sp	8
Apocynaceae	*Cerbera* sp.	7
Guttiferae	*Garcinia nigrolineata* Planch. ex T. Anderson	7
Euphorbiaceae	*Baccaurea parviflora* (Müll.Arg.) Müll.Arg.	6
Anacardiaceae	*Buchanania arborescens* (Blume) Blume	6
	Unknown Species 2	6
Melastomataceae	*Memecylon*sp	5
Erythroxylaceae	*Erythroxylum cuneatum* (Miq.) Kurz	4
Celastraceae	*Euonymus cochinchinesis* Pierre.	4
Meliaceae	*Aglaia* sp.1	3
Sapindaceae	*Nephelium* sp	3
Sapotaceae	*Palaquium obovatum* (Griff.) Engl.	3
Caesalpiniaceae	*Sindora wallichii*Grah. exBenth.	3
Meliaceae	*Aglaia* sp. 2	2
Moraceae	*Artocarpus scortechinii* King.	2
Lecythidaceae	*Barringtonia macrostachya* (Jack) Kurz.	2
Elaeocarpaceae	*Elaeocarpus mastersii* King.	2
Flacourtiaceae	*Hydnocarpus* sp	2

Myristicaceae	*Knema glauca* (Blume) Warb.	2
Meliaceae	*Sandoricum koetjape* (Burm.f.) Merr.	2
Sterculiaceae	*Sterculia* sp	2
Myrtaceae	*Syzygium* sp. 1	2
Myristicaceae	*Knema globularia* (Lam.) Warb.	1
Myrtaceae	*Adinandra dumosa* Jack.	1
Rubiaceae	*Diplospora malaccensis*Hook.f.	1
Elaeocarpaceae	*Elaeocarpus*sp	1
Simaroubaceae	*Eurycoma longifolia* Jack.	1
Moraceae	*Ficus* sp	1
Anacardiaceae	*Parishia insignis*Hook.f.	1
Sapotaceae	*Pouteria obovata* (R.Br.) Baehni.	1
Rubiaceae	*Timonius wallichianus* (Korth.) Valeton.	1
	Unidentified Species 1	1
	Unidentified species 3	1
Sapindaceae	Unidentified Species 4	1
Euphorbiaceae	Unidentified Species 5	1
Total		159

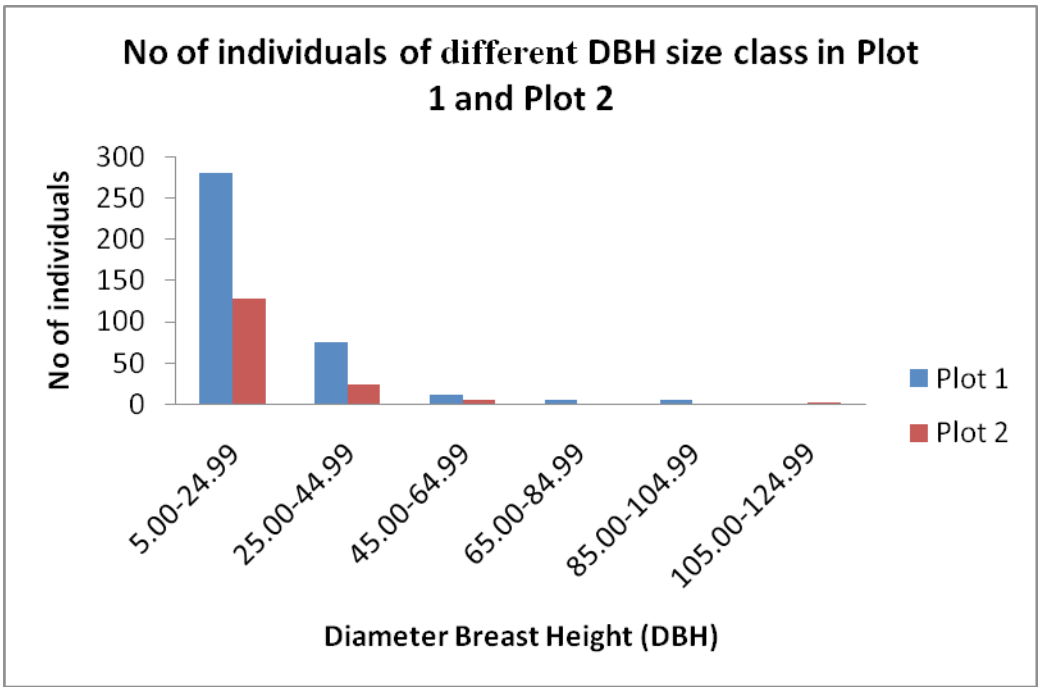

Figure 2 The number of different DBH size class in Plot 1 and 2

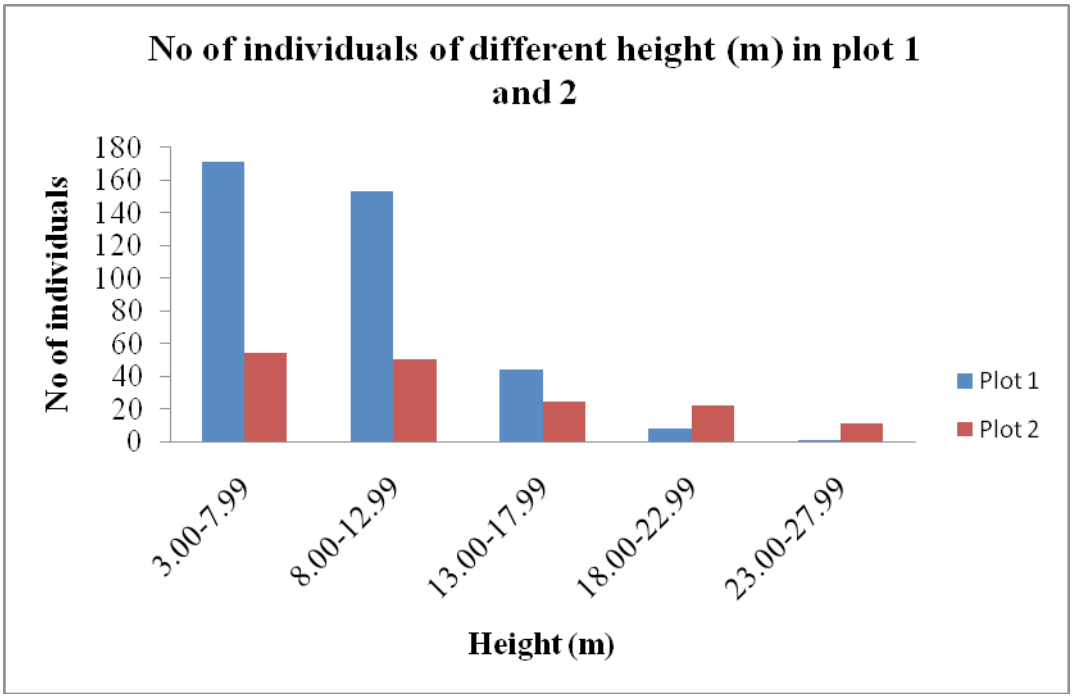

Figure 3 The number of individuals of different height (m) in Plot 1 and Plot 2.

4. Discussion

Studies on the island flora have been conducted by several researches. In Malaysia for example, a few forested islands have been selected as research sites to explain the distribution of tree species. Recent studies by Senterre et al. (2015) in Pulau Babi Tengah reported 312 taxa that belongs to 101 families of vascular plants. Meanwhile, Mahmud Khairil et al. (2013) reported 72 species from 31 families of tree species in Pulau Redang. It is part of the conservation of biodiversity effort initiated due to the development of tourist resort that starts to make sense in those islands. What is seen in Pulau Perhentian is a sanctuary of flora and fauna in both the land and sea ecosystem. The blue ocean that surrounds the island is the aquatic paradise for tourists. However, little is known on the bliss of the land occupied with the extensive forest stands where the tiny creatures often hide.

Inventories on the tree species conducted, led to the discovery of several flora species occupying the forested island of Pulau Perhentian. Some of the major tree family that dominates the study site comprising of Dipterocarpaceae, Myrtaceae, Anacardiaceae, Hypericaceae, Euphorbiaceae and Verbenaceae. Identification of the tree taxa was crucial to give some clue on what sorts of plants or trees were favoured by the animals hiding within the forests as trees are the main plant forms that make their habitat. This indicates the need to protect the existing rainforests. This happen in Indonesia as the rainforests is the main elements of promoting ecotourism in the Melemba forest area of Batang Lupar in Kapuas Ulu district, Kalimantan Indonesia as initiated by WWF Indonesia (Tamindael, 2015).

Previously, Latif et al. (1999) on the vegetation and flora of Pulau Tioman, Peninsular Malaysia discussed on the needs of conservation effort for sustainable development in Pulau Tioman. Similarly, this is what should have been done in Pulau Perhentian. Due to the natural geographical formation of the island with the hills and steep slopes dominating the mainland, the flat land is limited and can only be found on various strips of the beach. Therefore, there is no future onlarge scale agricultural and forestry activities on the island. Besides, the effort to industrialize the island is also worthless as there is no work force and resources. The only way for sustainable development of the island is to let the island be as it is, of course with the natural habitats itself but taking more effort to introduce and develop more ecotourism activities (Latif et al.,1999). In order to promote ecotourism, the biological component itself must be discovered and highlighted. In this case, the enchanting flora and fauna would be a good source. Forest inventories seem to be the most common ways to gain spatially based surveys within the project area to quantitatively assess species distributions by habitat type. Only then, extensive effort in providing more jungle tracks can be constructed and guided walks be

organized. Recent studies by Rahim et al. (2015) on the research of small mammals in Teluk Keke, Pulau Perhentian Besar had discovered the Dusky langur (*Trachypithecus obscurus)* and Sunda flying lemur (*Galeopterus variegatus).* The Dusky langur is spotted within the nearby forest and feed on the young shoot of *Terminalia catappa* (Ketapang). Therefore, the forest should be conserved as it could attract tourists who would like to see those enchanting mammals as well as to learn about the surrounding plants.

The surrounding environment of Pulau Perhentian is covered with extensive stands of several plants species that include trees, climbers, palms and shrubs forming a dense forest floor and highly covered canopy. The finding shows that the tree height is reaching almost to 30 meter. At this height, it is enough for some animals such as birds to perch and some mammals to crawl on the tree trunks and branches. In studies by Davis et al. (2011), on the vertical distribution of beetles in a tropical rainforest in Sulawesi showed that the highest number of individuals and species is on the forest canopy. In other studies, they showed that the herbivores and gall-forming species tend to be more copious and diverse in forest canopies (Basset et al. 1992; Basset, 2001; Ribeiro & Basset, 2007). This shows that the forest canopy is critical for most animals as it is the main habitat component that could affect animal survival. In addition, those trees contribute to the availability of leaf litters and foliage that is good to maintain the soil moisture. Leaf litter is important as it can be the nesting platform and hiding place for some tiny animals. Trees also promote the growth of some climber which was important for some canopy dwelling animals as it provides inter-pathway for the animals to pass from one tree to another. Without this natural trees connector, the canopy –dwelling animals might force to move on the ground, be more exposed and increase the risk of predation.

Some of the trees are commonly found in coastal area and favoured island based ecosystems. Tree species such as *Buchanania arborescens, Erythroxylum cuneatum*, *Chaetocarpus castanocarpus*, *Rapanea porteriana*, *Pouteria obovata*, *Symplocos adenophylla* were found to be well adapted with sandy vegetation at the coastal site (Turner, 1995). Some of the tree species within and outside of the plots were observed to bear fruits whilst the others were flowering. The phenology of the forests was essential for many kinds of animals that depend on the fruits for foods and flowers for nectars. Other than that, with the spotted timing of flowering, fruiting and leaf flushing would give idea to the tourists to spot any animals of their interests as well as to see and learn their behaviour in the *in-situ* habitat. Trees such as *Vitex pinnata*, *Sindora wallichii*, *Alstonia macrophylla* and *Syzygium* spp. were observed to bear fruits. Some small mammals such as squirrels, bats and avifauna species depend on the availability of fruits in the island. Meanwhile, invertebrate such as butterflies and bees feed on the nectars of the flowering plants. Some trees of *Vitex pinnata* and *Scarvola taccada* was flowering with some bees observed landing on the flowers. The forests indeed contains some beneficial tree species that can be turned into economic products. *Vatica cinerea* (Dipterocarpaceae), *Polyalthia sumatrana* (Annonaceae) is a good source of timber. *Sindora wallichii* (Caesalpiniaceae) can be made as timber, wood oil and having medicinal value. *Erythroxylum cuneatum* (Erythroxylaceae) is a source of timber and medicine. *Barringtonia macrostachya* (Lecythidaceae) and *Eurycoma longifolia* (Simaroubaceae) are good source of medicine (Burkill, 1966). However, as to carry on the sustainable tourism in context of botany in the island, utilization of the resources is not applicable due to its small-scale of forest and higher fragility of the ecosystems. Therefore, planning and providing facilities such as in-situ display for plants with significant information, more trails of connecting the resorts site, resting point on top of the hills that offer delightful landscapes of nature and Blue Ocean would be relevant. Expert tour guides are necessary for handling of tourists. With a great consideration on providing the facilities on the blissful land and experts for guiding and monitoring would make better sustainable tourism in Pulau Perhentian.

However, the dilemma in trying to promote ecotourism to the world is that does it really saves and protects the flora and fauna? Due to over exposure to the public, those elements might be harmed or disturbed. Researches are competing to introduce new ecotourism sites, each with different potential but at the same time to sustainably conserve and protect the site. Studies by Kruger (2005) explain the impact or consequences of ecotourism towards conservation of threatened species and habitat by using 251 case studies throughout the world. In relation to the habitat, the finding shows that ecotourism is less sustainable in islands and mountain regions particularly higher fragility of the ecosystems and lower carrying capacity for the tourists. However, in the end Kruger (2005) had emphasized on the need for effective control and management of tourist numbers and distribution as it is the main reason for the unsustainable case studies. Hence, as a suggestion, ecotourism should be in small-scale and locally operated or owned together with careful planning and management prior to any ecotourism project settlement.

5. Conclusion

Sustainable tourism with regards to botany is applicable in Teluk Keke, Pulau Perhentian Besar. However, proper management and monitoring on the land ecosystem especially the forests is highly recommended due to the presence of some rare wildlife hiding within the smaGosslI scale forests of the island. More research on the terrestrial ecosystem focusing on the interaction between flora and fauna can be conducted to provide more baseline dataset for comparison with future surveys.

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Appendix

Photo 1 Floristic view within the forest in Plot 1. (Photo by Mohd.Abid Kamarazumman)

Photo 2 The view of the forest in plot 2. Palms species that is Caryota mitis is found to be well adapted. (Photo by Mohd Abid Kamaruzamman)

LEPIDOPTERA (ORDER: RHOPALOCERA) SURVEY TO ENHANCE THE ECOTOURISM INITIATIVE IN TASIK KENYIR, TERENGGANU, MALAYSIA

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ABSTRACT

Butterflies are important in the conservation process as they represent the most appropriate model for habitat monitoring and biodiversity rapid assessment. The lack of accurate information on the effects of habitat disturbances makes it difficult for researchers to predict the biodiversity of the tropical rainforest. The aim of this study is to generate butterfly species data in Tasik Kenyir, Terengganu. The collected data will form the foundation for a long-term monitoring program and for future research works on butterfly population. The data will eventually form the species baseline information for butterfly tourism. The faunistic composition of rhopalocera was studied using 20 baited traps in which 10 baited traps were set at the canopy level and another 10 baited traps were set at the under storey, seven days in each month, from February 2015 until June 2015. A total of 95 species from six families of Papilionidae, Nymphalidae, Pieridae, Lycaenidae, Hesperiidae and Riodinidae were recorded during the assessment. Butterflies are one of the major contributors to forest formation as they pollinate a wide variety of flowers. Thus, the conservation of butterflies is vital in maintaining the species population and fauna of the area to enhance the ecotourism initiatives in Tasik Kenyir.

Keywords: Butterflies, diversity survey, conservation and Tasik Kenyir.

1. Introduction

Tasik Kenyir is situated on the west of Kuala Berang, which is on the western part of Terengganu. Tasik Kenyir was formed after the construction of hydroelectric dam on Sungai Terengganu, forming a 369 square kilometers of artificial lakes that became South-East Asia's largest man-made lake (Allen, 2012). It is surrounded by numerous small and large forested islands and enclosed with wide-ranging forest (Ministry of Culture, Arts and Tourism Malaysia, 1997). Tasik Kenyir offers several ecotourism destinations within it. Ecotourism destination can be defined as recreation areas and facilities that suit the natural capacity (Stankov et al., 2011). For example, Sungai Buweh (5.148, 102.778) which is located 5.5 km from the jetty is the only waterfall that can be accessed over land. The other recreational units that can be visited are Saok fall (5.083, 102.778), Lasir Fall (4.964, 102.841), Lata Baju (4.966, 102.826), Sungai Petang Fall (4.968, 102.776) and Pos Kawalan Fall (4.935, 102.789) (Waterfalls of Malaysia, 2012). These waterfalls can be visited by cruising through the Kenyir lakes using a houseboat. The density of development in these areas is low, thus ecotourists have greater opportunity to experience its natural surroundings.

Besides that, there are other interesting places to visit, for example, Taman Herba Tasik Kenyir, Taman Tropika Kenyir, Taman Rama-Rama and Taman Orkid Kenyir. Taman Herba Tasik Kenyir is located in Pulau Sah Kecil. The 15.84 hectare of park offers more than 200 types of herbal plants consisting of misai kucing, kacip fatimah, tongkat ali and others (Malaxi, 2015). Here, visitors are given the opportunity to taste herbal beverages that are known for their nutritional and therapeutic values. Tasik Kenyir also offers tourists spectacular limestone hills formation at Gua Bewah. Gua Bewah is known as Gua Tahi Kelawar because of the guano in that cave and the many species of bats living there. For archaeology lovers, Gua Bewah is believed to be historically important as there has been the discovery of several archaeological artefacts such as axes, kitchen utensils, and tools. Ancient skeletons were also found there and some of the archaeologists have estimated the bones to be around 16,000 years old.

Forested area in Tasik Kenyir offers numerous ecotourism and nature-based activities, which include fishing, bird watching, jungle-trekking, visiting the waterfalls, experiencing the houseboats and in the chalets on the islands. Tasik Kenyir is one of the recommended sites for bird watching in Malaysia because of the diversity of avifauna. For example, Tasik Kenyir is known as home to nine out of ten species of hornbills. Exotic animals such as *Panthera tigris jacksoni* (Malayan tiger), *Panthera pardus* (Leopard), *Elephas maximus* (Asian Elephant), Serow (*Capricornis sumatraensis*), Dhole (*Cuon alpines*) and Mahseer (*Tor tambroides*) are good representation of diversity richness in Tasik Kenyir. Because of its various natural resources and rich diversity, Tasik Kenyir is highly potential to be developed as an ecotourism destination. Ecotourism can be define as travel and visitation that are based on natural resources especially those significantly related to undisturbed natural areas, which encourage enjoyment and appreciation of nature; promotes conservation, has low visitor impact, and provides benefits for local populations in socio economic involvement (Ceballos-Lascurain, 1993).

2. Butterflies

Butterflies are insect from the suborder Rhopalocera (Phylum Insecta: Order Lepidoptera) that are characterized by its two pairs of scales (sometimes hairy) and overlapping wings, which serve as a single pair by flapping them (Abang, 2006). Butterflies have been recommended as a useful bio-indicator by many researchers as they demonstrate direct linked association with the microclimate, abundance of host plants, and patterns of resource availability (Kremen, 1992; Kuussaari, Nieminen & Hanski, 1996; Fermon et al., 2000). They can be functional indicators in detecting ecosystem variation caused by disturbance as their composition varies based on their habitat preferences (Waltz & Covington, 2001; Hamer et al., 2003). Butterflies are also known as the best-studied insect group in Southeast Asia for taxonomy and biogeography (Aoki et al., 1982; Tsukada et al., 1985; Tsukada, 1991).

Rainforests in Southeast Asia are ranked among the most biologically diverse areas in the world (Myers et al., 2000). Nevertheless, Southeast Asia records the highest relative rate of net forest loss and degradation in the humid tropics (Achard et al., 2002). It has been predicted that three-quarters of the original forest and half of its species could be lost by the year 2100 (Brooks et al., 2002). Understanding the natural communities and the processes that control their variability within the time frame and space are essential to ecological diversity studies and its implementation in environmental management, monitoring and conservation (Christharina & Abang, 2014).

The present study conducts a survey to assess the diversity and community assemblages of frugivorous butterflies in Tasik Kenyir, Hulu Terengganu, Terengganu. The data information and interpretations from the present study would provide added information for the developing, planning and implementation of ecotourism and community awareness programs based on butterflies.

3. Methodology

The surveys were conducted from February 2015 to June 2015 in Tasik Kenyir, involving seven days of sampling each month. Butterflies were sampled using baited traps installed at both the lower and upper levels of the forest layer (Christharina & Abang, 2014). For the lower level traps, the traps were positioned at 1.5 m above the ground level while the traps on the upper level were placed about 15-22 m above the ground level (Christharina & Abang, 2014). Rotting pineapples were used as baits to attract the butterflies. Studies by Beck and Schulze (2000), DeVries and Walla (2001) and Dumbrell and Hill (2005) have proven that the odour of rotting fruit or any soft fruits are effective to bait butterflies. Supplementary sampling was also conducted using aerial netting placed along a one kilometre stretch between 0800 and 1700 for under storey butterfly species. Species were identified to the lowest possible taxon using pictorial and key guides by Corbet et al. (1992).

4. Results

A total of 253 butterflies from 95 species were collected during the surveys, belonging to six families which are the Papilionidae, Pieridae, Nymphalidae, Lycaenidae, Riodinidae and Hesperiidae (Table 1). The butterfly species composition significantly showed that the family Nymphalidae (64 species) has the highest number of species recorded, followed by Pieridae (16) while Hesperiidae (1) recorded the least. The checklist of butterflies recorded during the research is as provided in Table 2.

Table 1 The percentage of the butterfly fauna recorded from study compared to species known from each family in Peninsular Malaysia

Family	No of species in Peninsular Malaysia	No of species recorded	Percentage of species recorded
Papilionidae	45	6	13.33
Pieridae	45	16	35.56
Nymphalidae	275	64	23.27

Lycaenidae + Riodinidae	411	8	1.95
Hesperidae	255	1	0.39
Total	**1031**	**95**	**9.21**

Note. Numbers of species in families Lycaenidae and Riodinidae were combined as subfamily Riodininae is now documented as a valid family (Campbell et al., 2000)

Table 2 Checklist of the butterfly fauna recorded at Tasik Kenyir, Hulu Terengganu, Terengganu

Family	**Scientific Name**
Papilionidae	*Graphium evemon eventus* *Graphium sarpedon luctatius* *Idea* sp. *Papilio* (Princeps) *memnon agenor* *Papilio polytes romulus* *Pathysa macareus perakensis*
Pieridae	*Appias indra plana* *Appias luncida vasava* *Appias nero figulina* *Appias paulina distant* *Cepora judith malaya* *Dercas verhuelli herodorus* *Eurema andersonii andersonii* *Eurema hecabe contubernalis* *Eurema lacteola lacteola* *Eurema simulatrix tecmessa* *Eurema tilaha nicevillei* *Gandaca harina distant* *Hebomoia glaucippe aturia* *Pareronia valeria lutescens* *Prioners philonome themana* *Saletara liberia distant*
Nymphalidae	*Amathuxidia amythaon dilucida* *Athyma perius perius* *Bassarona dunya dunya* *Bassarona recta monilis* *Bassarona teuta goodrichi* *Bassarona teuta rayana* *Charaxes bernardus crepax* *Cirrochroa orissa orissa* *Cirrochroa surya siamensis* *Cirrochroa tuche rotundata* *Danaus melanippus hegesippus* *Dichorragia nesimachus* *Discophora timora perkensis* *Dophla evelina compta*

	Elymnias casiphone saueri *Elymnias nesaea lioneli* *Elymnias panthera panthera* *Elymnias penanga penanga* *Euploea eunice leucogonis* *Euploea mulciber mulciber* *Euploea radamanthus radamanthus* *Euthalia alpheda langkawica* *Euthalia kanda marana* *Euthalia mahadeva zichrina* *Euthalia monina monina* *Faunis caners arcesilas* *Ideopsis juventa sitah* *Ideopsis vulgaris macrina* *Junonia atlites atlites* *Junonia orithya wallacei* *Lebadea martha malayana* *Melanitis leda leda* *Melanitis phedima abdullae* *Moduza procris milonia* *Mycalesis fusca fusca* *Mycalesis intermedia distanti* *Mycalesis mineus micromalaya* *Mycalesis mnasicles perna* *Mycalesis orseis nautilus* *Mycalesis persoides persoides* *Neptis clinioides gunongensis* *Neptis hylas papaja* f. *mamaja* *Neptis omeroda omeroda* *Neptis sedata* *Pantaporia sandaka sandaka* *Pantoporia hordonia hordonia* *Parthenos sylvia lilacinus* *Phaedyma columella singa* *Polyura athamas athamas* *Polyura moori moori* *Rhinopalpa polynice eudoxia* *Tanaecia iapis puseda* *Terinos clarissa malayanus* *Terinos* sp. *Terinos terpander robertsia* *Vindula dejone erotella* *Ypthima baldus newboldi* *Ypthima horsfieldi humei* *Ypthima huebneri* *Ypthima pandocus corticaria* *Ypthima pandocus tahamensis* *Ypthima* sp. *Ypthimas horsfieldii humei* *Zeuxidia doubledayi doubledayi*
Riodinidae	*Abisara geza niya* *Zemoros emesoides emesoides*

Lycaenidae	*Arhopala antimuna antimuna* *Cheritra freja frigga* *Curetis tagalia jopa* *Jamides celeno aelianus* *Jamides ferrari evansi* *Zizula hylax pygmaea*
Hesperidae	*Aneistroides gemmifer gemmifer*

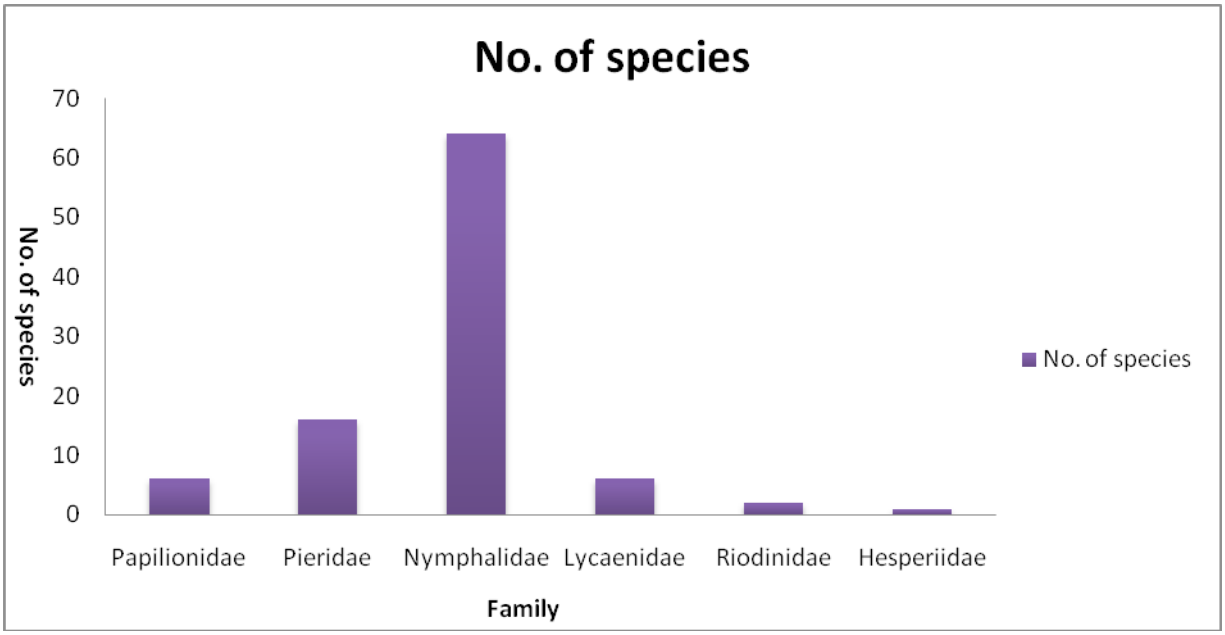

Figure 1 Species composition of butterfly from each family recorded at Tasik Kenyir, Hulu Terengganu, Terengganu

5. Discussion

Tasik Kenyir is one of the reservoirs that need good management and conservation practices. Some anthropogenic activities surrounding Tasik Kenyir may threaten the tropical butterfly diversity. One major concern is the rapid loss and fragmentation of existing lowland dipterocarp forest (Lambert & Collar, 2002). Land conversion to agriculture might be the most destructive form of habitat loss for Lepidoptera (Dunn, 2004; Sodhi et al., 2009). Koh (2007) stated that the larval host-plant specificity, habitat specialization, and geographic distribution were among the best determinants of local extinction risk. Forest species are most likely at risk due to reduced habitat heterogeneity caused by loss of microhabitats in forest fragments, and may suffer local extinctions (Yong et al., 2012).

Figure 2. Some of the butterflies that can be seen in the forest
Photo: Fathihi Rosmidi, 2015

The findings of the present study shows that Tasik Kenyir has significantly high diversity of butterflies even though lesser number of species was recorded in the present study compared to the research by Yong et al. *(*2012). Some interesting butterflies from the family of Nymphalidae and Pieridae (e.g., *Euploea mulciber* and *Hebomoia glaucippe*) can be easily found in the shrubs throughout the roads or tracks. Some other species from the family of Papilionidae and Nymphalidae (e.g. *Papilio polytes romulus* and *Athyma perius perius*) were seen feeding on plants while other butterflies (e.g., family Hesperiidae) were seen skipping from one leaf to another. The data collected can be used to enhance the ecotourism attractions of Tasik Kenyir.

This initiative can develop local community ecotourism by motivating them to contribute to the protection of the area. Successful lepidopteran ecotourism will offer additional economic encouragement and generate benefits to the local community to conserve the area. Economic income can also be maximized through the sale of butterfly merchandise and traditional crafts of the local communities.

6. Conclusion

The study shows that Tasik Kenyir is home to a rich diversity of butterflies. As there is no proper ecotourism activity on butterflies in Tasik Kenyir, the present study highlights the potential of development and planning of an ecotourism activity based on butterflies that is sustainable to the environment of Tasik Kenyir and its surrounding people. Even though there is Taman Rama-Rama which exhibits butterflies for the tourists, the butterflies provided there does not fully represent the butterfly community in Tasik Kenyir. Thus, the establishment and implementation of a good ecotourism plan based on its butterfly richness provide a baseline knowledge of butterflies in the area.

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ECTOPARASITES OF SMALL MAMMALS IN BELUKAR BUKIT AND THEIR ECOTOURISM IMPORTANCE

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ABSTRACT

Wildlife tourism such as mammals and bird watching has been an important tourist attraction lately. The main purpose of these activities is to experience the animals in its natural habitat. Introducing such tourism activities contribute not only to the country's economy but also to the state and local community. However, there are certain things that must be considered to provide a safe environment for tourists. Therefore, a survey in Belukar Bukit, Hulu Terengganu was conducted to identify the species of ectoparasites infesting small mammals and to investigate the potential public health risk at Belukar Bukit waterfall. A total of 12 non-volant small mammals comprising of 3 species of rat (*Maxomys surifer, Mus musculus* and *Leopaldamys sabanus*), 2 species of squirrel (*Callosciurus notatus* and *C.caniceps*), 2 species of flying squirrel (*Hylopetes spadiceus* and *Petinomys setosus*) and one species of tree shrew (*Tupaia glis*) were caught and examined for ectoparasite. A total of 174 individuals of ectoparasites belonging to the family of Ixodidae, Listrophoridae and Laelapidae were retrieved from small mammals. Two of the families collected were Ixodidae and Laelapidae are medically important ectoparasite. The presence of the medical important ectoparasite reflects the potential of public health risk at Belukar Bukit. Therefore, more awareness and precautionary measures should be adopted to create a safe environment for the ecotourism industry at Bukit Belukar.

Keywords: ectoparasite, small mammals, belukar bukit and ecotourism.

1. Introduction

Malaysia is a well-known tourist destination as it is rich in its cultural and wildlife diversity. Tourism provides income for the development of the country as well as promotes the beauty of Malaysia. According to Muehlenbein and Ancrenaz (2009), ecotourism has the potential of promoting wildlife conservation, increase public awareness and increase revenue for the protection of the endangered species.

In this context, wildlife refers to the variety of all living organisms living in the wild, be it at the genetic, species, and ecosystem levels (Amare, 2015). Meanwhile, nature-based tourism accounts for a growing proportion of international tourism activity (Muehlenbein & Ancrenaz, 2009).

In the effort to promote ecotourism, there are many aspects that need to be monitored and more importantly when it comes to the health and well-being of tourists. The level of health and safety of ecotourism can be classified into many aspects and one of them is the environment. One of the ways to measure the health and safety level of the environment at the ecotourism destination is to know the potential public health risk in that area.

The potential public health risk can be reflected by the presence of the animal that act as carrier or host for the zoonoses disease. One of the most popular zoonoses diseases is the leptospirosis. According to Thayaparan et al. (2013), leptospirosis is caused by the bacteria named *Leptospirosis interrogan* carried by small mammals. Besides carrying the bacteria, the small mammals also become host to the many species of ectoparasites that are medically important and is transmitted to human through close contact with their habitat.

Belukar Bukit has a big potential of becoming the next ecotourism destination in Terengganu as the views on the hill is breathtaking and it has a waterfall. The lowland dipterocarp forest of Belukar Bukit is an important shelter for many species of valuable animals, such as the spectacular langur, gibbon, hornbill and giant squirrel species. Many local people visit the Belukar Bukit because of these attractions and its popularity is gradually growing among the foreign visitors. Thus, the main objective of this survey is to identify the ectoparasite of the small mammals in Belukar Bukit and their potential in spreading zoonoses disease.

2. Materials and Methods.

2.1. Study Site

Belukar Bukit is located next to the amenity forest under the Terengganu State Forestry Department, 63 km from the Kuala Terengganu city (latitude 4°54.406'N and longitude102°59.147'E) (Figure 1).

Source: Google maps

Figure 1 Maps of Belukar Bukit

2.2. Host Collection

The non-volant small mammals were trapped using the collapsible cage traps. A total of 50 cages were placed at the identified location for three days before the cages were relocated to other locations to maximize the sampling area. The cage traps were baited with banana dipped with vanilla essence. The cage traps were set up at every 10 meters along the trail. All the traps were checked twice a day, at the 0800h and 1700h. The trapped animals were placed in the individual cloth bags to prevent contamination of ectoparasite from infested animal to other animals. The animals were identified following description and illustration that was produced by Payne and Francis (2007) and Francis (2008). Samples of the individual host species were collected, euthanized using chloroform and preserved in 70% ethanol. The released animals were marked with nail polish to prevent recapturing.

2.3. Ectoparasite Collection

The host animals were anesthetize in the individual cloth bag. The cloth bags were turn inside out and shaken to remove its content into a white enamel tray (Chuluun et al., 2005; Mariana et al., 2008). The content in the white enamel tray were inspected for ectoparasite. The fur of the host animals were combed using a fine tooth comb to remove ectoparasite that are attached to the host animal's body into the enamel tray (Chuluun et al., 2005; Mariana et al., 2005). The ectoparasite was collected using a sharpened wooden applicator stick and the ectoparasites were placed in the collection vials containing 70% ethanol. The ectoparasite were collected and sampled separately according to the individual host animal (Madinah et al., 2011). The vials were labeled with information, such as the host species, location, ecology, sex and the date of collection. The ectoparasite samples were brought back to the laboratory for identification.

2.4. Ectoparasite Identification

The ectoparasite was identified using a stereo microscope. It is then sorted out based on their morphology. The acarine ectoparasite was mounted based on the methods applied by Mariana et al., (2005), Chuulun et al. (2005) and Madinah et al. (2011).

The meso stigmatid mites were removed from the alcohol and rinsed in water. The mites were placed in the lactophenol solution (a clearing agent) for 1 week at room temperature. Small punctures were made with minute pin in the lateral edges of the larger specimens to facilitate lactophenol entry. Cleared specimens were washed once in distilled water and mount in Hoyer's medium.

Individual chiggers (larval trombiculid mites) were remove from the alcohol and placed directly in a drop of Hoyer's medium on a glass slide. A cover slip was placed over the specimen. The slide was intermittently warmed using a bunsen burner to facilitate clearing. At the same time, occasional light pressure were exerted using a sharpened applicator stick on areas of the cover slip surrounding the specimen. Listrophorid mites and lice were also processed and mounted following the technique used for the mesostigmatid mites. The prepared slide was then examined under compound microscope for further identification. The ectoparasite was identified using the key published by Kohls (1957) and Strandman and Mitchell (1963).

3. Result

A total of 12 non-volant small mammals comprising of 3 species of rats (*Maxomys surifer, Musmusculus* and *Leopaldamys sabanus*), 2 species of squirrels (*Callosciurusnotatus*and*C.caniceps*), 2 species of flying squirrels (*Hylopetesspadiceus* and *Petinomys setosus*) and one species of tree shrew (*Tupaia glis*) were examined for ectoparasites. The species of small mammals and their ectoparasites are as shown in Table1.

Table 1 Infestation rate of ectoparasite on non-volant small mammals in Belukar Bukit

Host Species	No. caught	No. of host infested		
		Ticks	Mesostigmatids	Listrophorids
Rodentia				
Callosciurusnotatus	3	1	-	1
Callosciuruscaniceps	2	-	-	-
Hylopetesspadiceus	1	-	-	-
Maxomyssurifer	1	1	1	1
Mus musculus	1	-	-	-
Leopoldamyssabanus	2	1	1	1
Petinomyssetosus	1	-	-	-
Scandentia				
Tupaiaglis	1	-	-	-
Grant Total	12	3 (25 %)	2(16.67%)	3 (25%)

(-) means no ectoparasite were retrieve from that particular species.

Three groups of ectoparasite were collected from the sampled non-volant small mammals. The ectoparasites found were ticks, mesostigmatid mites and listrophorid mites. Three families of ectoparasite were identified, which were the family of Ixodidae, Lealaptidae and Listrophoridae. The rate of ectoparasite infestation ranged from 16.67% to 25%. The ectoparasites that showed the highest infestation rate were ticks and listrophorid mites (Table 1). Even though the Mesostigmatid mite showed the lowest infestation rate, a total of 109 mesostigmatid mites were collected from a single individual of host (Table 2).

Table 2 Number of ectoparasite collected from non-volant small mammals

Host species	Families of ectoparasite		
	Ixodidae	Laelaptidae	Listrophoridae
Rodentia			
Callosciurusnotatus	15	-	1
Callosciuruscaniceps	-	-	-
Hylopetesspadiceus	-	-	-
Maxomyssurifer	25	109	6
Mus musculus	-	-	-
Leopoldamyssabanus	16	-	1
Petinomyssetosus	-	-	-
Scandentia			
Tupaiaglis	-	-	-
Grand total	56	109	8

4. Discussion

The *Maxomys surifer* is the only host species that was found being infested by all families of the ectoparasite found in Belukar Bukit with high numbers of ectoparasites from the families of Ixodidae (25 individuals) and Laelaptidae (109 individuals). The *M. surifer* or its common name the red spiny rat has been categorized as the least concerned species by IUCN due to its wide distribution and large population. Even that, only one individual was caught. This may be due to the poor weather condition as it was raining during the sampling period. Previous study of ectoparasites from small mammals at other locations (Mariana et al., 2005; Mariana et al., 2011; Mohd Zain et al., 2015) reported that other species of ectoparasites were also found to infest this species of rat. This shows that this rat species is one of the important ectoparasites reservoirs.

In this study, a total 165 individuals of ectoparasites were identified as a member of two medically important ectoparasite family; 59 belonging to the ixodidae family and another 109 individuals belonging to the laelapidae family. The ixodidae family is the second most important vector after mosquitoes, as it spreads five groups of microbial organism (spirochaetal, rickettsial, bacteria,virus and protozaon) agent of human disease (Murray, 1996)

This survey has shown lower ectoparasitic infestation compared to the previous studies conducted elsewhere in Peninsular Malaysia by Zahedi et al. (1996), Chuluun et al. (2005), Paramasvaran et al. (2009), Madinah et al., (2011) and Nursyazana et al., (2013). This trend shows that the probability of ectoparasite transmission from wild small mammals to human is low in Bukit Belukar. However, precautionary measures to prevent the transmission should still be taken as this survey has discovered the presence of the medical important ectoparasites inhabiting the survey area.

The transmission of the ectoparasites from wild small mammals to human in Belukar Bukit can be controlled by managing the population of the small mammals nesting close to the tourist attraction sites such as waterfall. This is very important as the ectoparasites life depends on its host. For example, ectoparasites from the laelapidae family are a nest-dwelling ectoparasite which completes its life cycle in the host nest and feeds on its host occasionally (Nadchatram, 2008). The wild small mammals also tend to move away from the forest and build their nest near to tourist attraction areas because they are attracted to the food waste and rubbish left by the visitors. This problem can be overcome by proper management of waste disposal.

Besides that, the study conducted by Nursyazana et al., (2013) shows that the number of ectoparasites infesting small mammals is low during the dry season (January until March and June until September). This information can be used by the ecotourism agents by encouraging ecotourism activities that involves the exploration of the forest during the low ectoparasites activity periods.

5. Conclusion

The present survey shows that Belukar Bukit has lower ectoparasite infestation as compared to other studies conducted by other researcher at other sites. However, the result from this survey is still insufficient to conclude the real health status of Belukar Bukit as this survey only covered a small part of the Belukar Bukit area. Further study and long term monitoring of the ectoparasite and other human disease vector should be conducted to declare the real health status of the area and to provide safe and healthy environment for the ecotourism industry.

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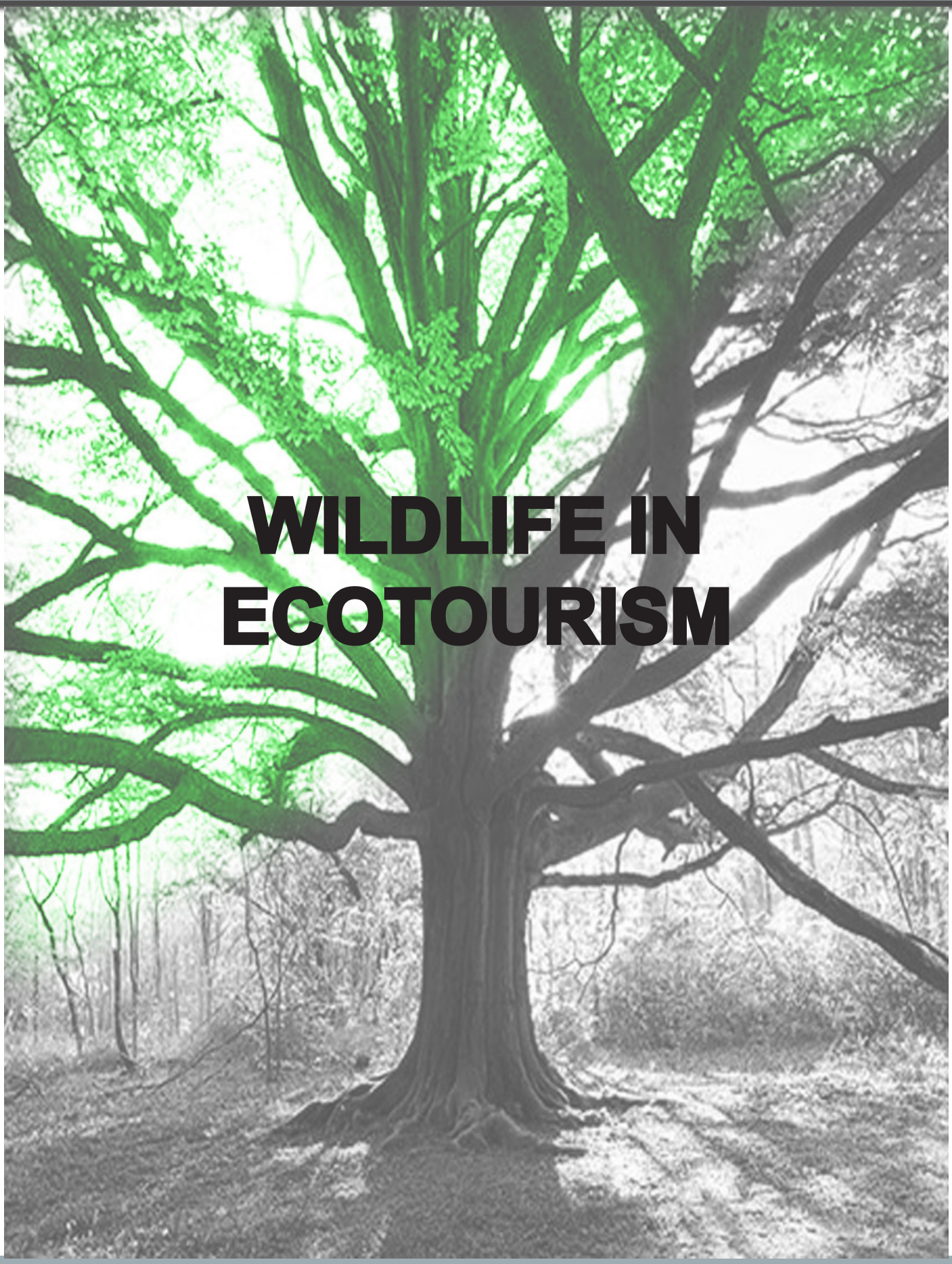

WILDLIFE IN ECOTOURISM

PROMOTING WILDLIFE TOURISM AS A CONSERVATION EFFORT OF THE ISLAND FLYING FOX IN PULAU BIDONG, TERENGGANU, MALAYSIA

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ABSTRACT

The Island Flying Fox, *Pteropus hypomelanus* is a bat from the order of Chiroptera. It is the smallest flying-fox in the Southeast Asia region. The Island Flying Fox is a habitat specialist that roost mainly on small islands and sometimes forage to the nearby mainland. However, this species is among the less studied bats in Malaysia and is threatened by hunting and habitat loss. The Island Flying Fox population, behaviour and ecology are unknown in Malaysia. Therefore, this study aims to suggest the potential of wildlife tourism activities in promoting and contributing towards the conservation of the Island Flying Fox in Malaysia. We chose Pulau Bidong which is situated near Pulau Redang because the Island Flying Fox was reported being there. Pulau Bidong is an uninhabited island and is known to the local people as an old Vietnamese refugee island. The survey in Pulau Bidong held from 31st May 2015 to 6th June 2015 captured 20 Island Flying Fox individuals using mist-netting. We also observed the Island Flying Fox foraging and roosting on the "*Ketapang*" trees (*Terminalia cattapa*). Some of the *Ketapang* trees are very small, ranging from 5 m to 10 m tall where the Island Flying Fox can be easily observed. By looking at the Island Flying Fox, we suggest that wildlife tourism is a potential tool for the conservation of bats which would indirectly provide economic resources to the local communities.

Keywords: Pteropus hypomelanus, wildlife tourism, conservation and Pulau Bidong.

1. Introduction

This study examines the potential of wildlife tourism as a conservation tool to promote conservation of the Island Flying Fox. Wildlife tourism is defined as tourism undertaken to view and/or encounter wildlife. Wildlife tourism can take place in a wide variety of areas, whether in captive, semi-captive or in the wild, and this includes a variety of relations that ranges from passive observation to feeding and/or touching of the species observed (Newsome et al., 2005). There are two forms of wildlife tourism, which are wildlife-independent and wildlife-dependent. The less invasive form consists of the wildlife-independent relationship where the activity of observing or hearing wildlife animals are an opportunity rather than an intention to cause harm whereas the wildlife-dependent activities are such as tracking of the wildlife, photography, sports fishing and hunting (Sinha, 2001). In this study, we focus on both the wildlife-dependent and wildlife-independent forms to promote the conservation of the Island's Flying Fox.

2. Background to Pulau Bidong

The Island Flying Fox (*Pteropus hypomelanus*) is a bat from the order Chiroptera (Family: Pteropodidae). The Island's flying fox is an important species because of its role as a seed disperser for forest regeneration. Its habitat distribution is only restricted to small islands making it prone to being threatened. It is among the less studied animals in Malaysia and there is limited information on this species.

In this study, we choose Pulau Bidong because it is an uninhabited island with a great potential as a wildlife tourism site. Pulau Bidong is situated eight nautical miles from the Merang Beach, Terengganu. The Bidong Archipelago encompasses of six islands with the largest island is about 260 ha. Pulau Bidong is a pleasant island that is known to the local people as "Little Saigon". Pulau Bidong was made a temporary home for the Vietnamese boat people who fled their country in the 1970s and 1980s. The first group of 47 Vietnamese refugees arrived on this island by boat. They were then named as the "Boat People".

The Malaysian federal government officially opened Pulau Bidong as a refugee camp on 8th August 1978. The camp could accommodate 4,500 refugees at one time. Pulau Bidong reached its peak in June 1979 when 40,000 refugees lived on this island. It was closed on 30th October 1991 where during a farewell ceremony, the island was officially handed back to the Terengganu state government. Pulau Bidong now serves as a maritime research centre for the Universiti Malaysia Terengganu (UMT) on a 1.6 ha land plot, in the western part of Pulau Bidong also known as Pantai Pasir Cina.

It has been reported that the wildlife population in Pulau Bidong was destroyed because the refugees ate any wildlife they could find on the island (Wan, 2003). The forested area was also cleared to provide space for the building of the refugee settlement. After being closed for many years, the vegetation has regrown and we believed that the Island Flying Fox played an important role as a seed disperser that contributed to the regrowth of the forest in Pulau Bidong, bringing wild seeds from the nearby islands and spread it to Pulau Bidong.

3. Materials and Methods

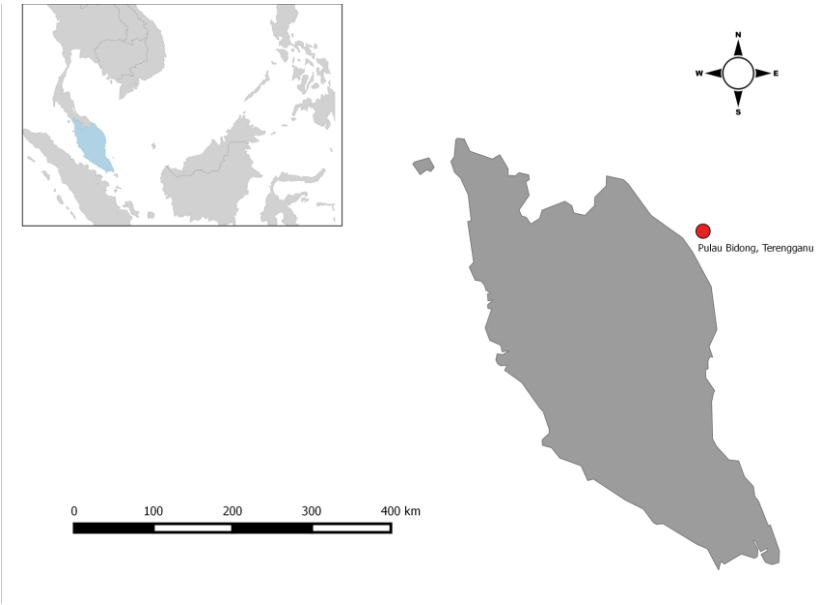

Figure 1 Map of Pulau Bidong, Terengganu, Malaysia
Source: Quantum GIS Development Team, 2009

A total of four understorey mist nets were set up at the height of below 5m. The 4 nets were set in the forested area near the old cemetery while another was set up behind the Universiti Malaysia Terengganu's chalet. Three sub canopy and canopy mist nets were placed at the canopy level at the height of 10 m to 20 m. The canopy mist nets were set by tying the lead fishing weight to a monofilament fishing line and shoot it over tree branches by using slingshot (Kunz & Parsons, 1988). When the monofilament line has been positioned to the targeted location, it was then used to pull nylon ropes. The same method was then repeated to the second selected branch of the tree within the same height range as the first branch. The mist nets were then tied to the rope and pulled to the desired height. Two harp traps were set up near the old cemetery. The morphological measurements (head and body, tail, forearm, tibia, ear height and weight) were taken with a digital calliper and electronic balance. Bats were identified following the keys from Francis (2008) and Kingston et al. (2006). Female bats were also checked on its breeding status (carrying pups, lactating or pregnant) (Mohd-Ridwan et al., 2011). The selected specimens were euthanized and preserved in 70% ethanol. The specimens were then deposited at the Museum of Zoological Kenyir (MZK).

4. Results

A total of three species comprising of 81 individuals were collected throughout the study in Pulau Bidong. The most abundant species was the *C. brachyotis* with 64 individuals while the least species was *M. spasma* with only one species collected. The best part of this study was the capture of the Island's flying fox in the sub canopy and canopy mist nets which were hardly captured in other places. The *C. brachyotis* was found at the old cemetery on the hill whereas the *M. spasma* was captured behind the University Malaysia Terengganu (UMT) chalet. Meanwhile, the *P. hypomelanus* was captured at the sub canopy mist nets at the height range of 8 m set on the Ketapang tree nearby Pantai Pasir Cina. It was also being captured at the canopy mist nets that were set up behind the Fisheries Centre at the height range of 15 m. The sub canopy mist net that was set up in the old cemetery captured none of the *P. hypomelanus* species.

5. Discussion

Bat conservation is vitally important for the world's ecosystems sustainability because they are a pollinator of the rainforest, spread seeds, and regenerate the rainforest (Pennisi et al., 2004). The Island Flying Fox is the focal organism to be protected through wildlife tourism besides other organisms found on this island. The main justification for the development of wildlife tourism attraction is that they provide stable long-term conservation of wildlife and wildlife habitat (Ballantyne et al., 2009).

We do believe that the wildlife tourism concept can be applied to promote conservation of this species in Pulau Bidong. Wildlife-based tourism consists of nature-based tourism that involves wildlife component such as a visit to sites with good wildlife presence, a visit to artificial attraction places that are based on wildlife, habitat-specific tours, animal watching, thrill-offering tours, hunting or fishing tours and ecotourism (Reynolds & Braithwaite, 2001). A healthy wildlife tourism will encourage tourists to observe the value of nature and at the same time be aware of the needs of conservation to protect nature. It's not just the flora and fauna that will benefit from wildlife tourism but it will also provide a source of income to the local communities such as the tour guides, boat operators and much more. There are several suggested wildlife tourism activities to justify the choice of Island's flying fox as an iconic species to promote wildlife tourism activities in Pulau Bidong.

Wildlife watching is a positive leisure activity for the watchers and it increases the economy of the local communities (Pennisi, 2005). Wildlife watching specifically relates to the non-consumptive form of wildlife-based activities such as observing and occasionally touching or feeding animals. This contrasts with the consumptive forms of wildlife-based activities such as hunting or fishing. Therefore, we would suggest the wildlife-independent activity where people just observe the Island's flying fox without touching it as a potential conservation initiative in Pulau Bidong. Wildlife watching in Pulau Bidong is specifically called "Bat Watching". Bat watching activities in Malaysia is only known when people visit caves such as the Kilim Geoforest where there is a cave known as the Bat Cave; or Wind Cave Nature Reserve in Sarawak, Gua Niah National Park in Sarawak, Gua Bewah in Terengganu and much more. These caves have been included in tour guiding activities, where people visit these places to enjoy watching the bats. However, bat watching activities are less known in forested areas. Our study in Pulau Bidong captured 20 Island's flying fox in the sub canopy and canopy layer of the forest. This does not include our own observation of the Island's flying fox where there are many found roosting on the Ketapang trees. Bat watching activities in Pulau Bidong can be done during the day and night. By using the night vision binocular, tourists can study the behaviour of the Island's flying fox even at night. Bat watching is an attraction to nature-loving tourists and thus can enhance the bats conservation awareness toward the public. Taking a local example from the Mulu National Park in Sarawak, many tourists visit there and watch the emergence of large colonies of bats from its roosting site. This has become one of the major attractions to the Mulu National Park where the activity has been included in tours programme. Hence, with the presence of the Island Flying Fox in Pulu Bidong, bat watching activity can also be organized to for people to visit the island and observe the Island's flying fox roosting and foraging. Interestingly, our observation found that the Island's flying fox in this island is accustomed to human presence as compared to other islands in Terengganu. They do not fly away quickly when we released them after taking all the measurements. They can be spotted roosting near the chalet and can be viewed at a close distance. They can also be easily spotted foraging during the night.

Another wildlife tourism activity that can be conducted on the island is volunteering tourism. Volunteering tourism or also known as voluntourism is increasingly popular worldwide (Sin, 2009). Voluntourism.org, define voluntourism as "the conscious, seamlessly integrated combination of voluntary service to a destination and the best, traditional elements of travel arts, culture, geography, history, and recreation in that destination". Wildlife volunteering is popular in Malaysia with non-governmental organisations and government agencies such as World Wide Fund (WWF), Rimba, Malaysian Nature Society, Heart of Borneo and many more. Through this activity, tourist can participate in wildlife conservation activities such as patrolling, exhibition, communal work up, and conservation awareness campaign. These voluntourism activities can be conducted through specially organized programmes for local and international university students and even for tourists that are interested in wildlife conservation efforts through voluntourism. Students can be invited to join trips to Pulau Bidong for the Island's flying fox conservation programme and they can be involved in wildlife conservation activities such as patrolling, species identification echolocation recording, tagging, and much more during such trips. Such activities contribute to the long-term conservation of the Island flying fox. For example, children exposed to interpretative programmes about snakes tend to show significant positive attitude change that will not erode over time (Morgan & Gramman, 1989; Ford, 1992). Although this may take a long time to see the effect of environmental awareness on the younger generation but it will instil the feeling of love for nature and conservation for a longer time.

6. Conclusion

The island's flying fox is an important seed disperser and pollinator of many plant species on the island. However, the Island Flying Fox in Terengganu is threatened due to excessive development because their habitat has been degraded and is decreasing. Through wildlife tourism, specifically, bat watching and volunteerism activities have the potential of conserving the island's flying fox. These activities would also benefit the local communities economically. The management of the forests in Pulau Bidong should use sound ecological approaches to ensure maximum protection of the Island Flying Fox and its forested area. Future research is needed to study the effects of Island's flying fox population to ecotourism activities.

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Appendices

Pteropus hypomelanus (Photo: Azuan Roslan, 2015)

Cynopterus brachyotis (Photo: Azuan Roslan, 2015)

Megaderma spasma (Photo: Azuan Roslan, 2015)

BIRD SANCTUARY: A POTENTIAL ECOTOURISM ACTIVITY IN LAKE KENYIR, TERENGGANU

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ABSTRACT

A field survey was conducted at Sungai Buweh Waterfall Lawit, Lake Kenyir, Hulu Terengganu (5°41'2.41"N, 102°41'44.47"E) from 20th to 26th April 2015 to inventories the diversity of birds. A total of 19 individuals from 13 species representing 7 families were recorded through mist-netting method. Ninety-seven observations from 33 species representing 17 families were recorded through point count method. The most captured bird was the *Arachnothera longirostra* (Little Spiderhunter) and the most observed bird was the *Merops viridis* (Blue-throated bee-eater). This paper presents a preliminary avian list for Sungai Buweh Lawit Waterfall, Lake Kenyir, Hulu Terengganu. Based on this survey, there are many canopy species that can be observed and studied along the Lake Kenyir Geopark. On further construction of the canopy walkway, the existence of a bird sanctuary along the canopy walkway will give a huge opportunity for avian enthusiast to observe and learn more about these canopy species; discover their diet and foraging behaviour. Bird watching can also be done at a higher level and threatened bird species can be conserved and secured in this sanctuary. The role of the canopy as source of food and shelter (e.g: nesting sites for hornbills) can also be learned through live telecast of these species along the lake. This paper discusses on the canopy species of birds' ecology and diversity and how the avian sanctuary can aid in the ecotourism in Lake Kenyir Geopark.

Keywords: Birds, ecotourism, mist-netting, point count and canopy.

1. Introduction

Tourism sectors such as nature tourism and unregulated tourist operators in this country has been growing very rapidly over the past few years that it has contributed to the increased number of tourists in natural areas (Tamblyn et al., 2005). The natural ecosystem carrying capacity and their wildlife have been badly affected by this action. According to Tamblyn et al. (2015), the tourism industry is clearly one of the main sources of income for this country, but it also causes conflict between human and wildlife needs. Tourism is a vital contributor towards the socioeconomic development of the country and therefore the government emphasized greatly on the domestic and international tourism. After the manufacturing and oil palm industry, tourism sector is ranked the third largest foreign exchange earner and it is still growing steadily until today.

Land use is under the jurisdiction of the respective state governments, according to the Malaysia constitutional law (Daud, 2002). Therefore, it is crucial for the involvement of the 13 states government in Malaysia in the development and promotion of land-based ecotourism activities. According to Daud (2002), the Malaysian Tourism Policy that was established in 1992 acknowledged that ecotourism is one form of tourism that should be maintained and promoted due to its higher chances of growing compared to other forms of tourism. The national ecotourism plan that was formulated in 1996 was responsible in contributing to the overall sustainable development of Malaysia. It has also promoted the conservation of the country's natural and cultural heritage.

Ecotourism is defined as "travelling to natural areas while conserving the environment and improving the well-being of the local communities" (International Ecotourism Society, 2007). Both the federal and state governments have been collecting funds to aid in the development of infrastructure facilities at different ecotourism destinations. Ecotourism destinations such as National Parks and Wildlife Sanctuaries, which are mostly located in rural areas are normally provided with basic infrastructure facilities, such as road accessibility, jetties and other services by the government. Bird watching is termed as an active observation, identification and photography of birds for recreational purposes and that leads to the term "birding" today (Glowinski, 2008). The establishment of tourism destinations in Malaysia is either gazzeted as terrestrial or marine protected areas in categories like forest reserves, wildlife reserves, sanctuaries, wetlands and marine parks.

Peninsular Malaysia which forms two-thirds of the southern peninsula has the Main Range with is at 2,165 m high as its backbone. Along the range are interesting birdwatching sites such as Cameron Highlands, Fraser's Hill and Genting Highlands. On its west side are low coastal plains while on its east side is a wider lowland area which consists of low coastal plains and foothills including freshwater lakes (Davison & Fook, 2003). Lake Kenyir currently holds the title as the largest man-made lake in South-east Asia with a total area of 260,000 hectares and it has been chosen to be developed as a national geopark. Lake Kenyir is in Terengganu and shares its borders with Pahang in the south and the state of Kelantan in the west that also provides accessibility to Taman Negara in Pahang through the Gawi Jetty and Petang Island. Lake Kenyir is surrounded by tropical forest which has 2,500 species of plants, 8,000 species of flowers, 360 species of birds and 300 species of fish.

There are estimated 9672 bird species in the world (Tamblyn et al., 2005). The total number of naturally occurring bird species in Malaysia is 785 while the total number of naturally occurring bird species in Peninsular Malaysia is 670 (Malaysian Nature Society, 2015). According to the Malaysian Nature Society (2015), there are four endemic species which are the *Polyplectron inopinatum* (Mountain Peacock Pheasant), *Cecropis badia* (Rufous-bellied Swallow), *Trochalopteron peninsulae* (Malayan Laughingthrush) and *Myophonus robinsoni* (Malayan Whistling-Thrush). Only the swallow is restricted to the central highland range. An additional of 71 subspecies are endemic to the Malay Peninsula region.

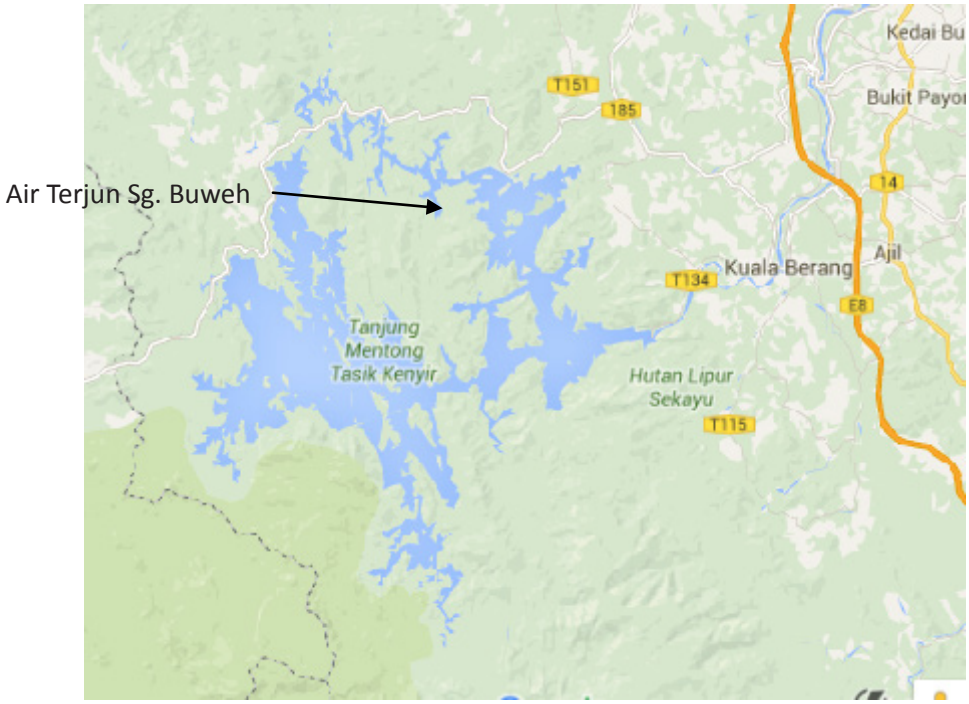
Significant interest has been focused on the study of avifauna in the forest canopy particularly in the tropical rain forests' canopy (Nadkarni & Lowman, 1995). According to Rahman (2002), binoculars can only identify some birds in the canopy through ground observation. Capturing birds are compulsory to obtain morphological data, collecting museum samples, blood or other tissues for genetic studies, parasite sample and to identify the brooding and moulting stage of specific birds. To study the forest canopy, multiple efforts and techniques have been invented such as building of a 42m platform above ground level by McClure (1966) to study the relationship between animals and the forest phenology of plant in the canopy of hill-slope forest in Selangor, Malaysia and climbing of tree trunks with diameter of 40cm and the construction of canopy walkway by Moffett and Lowman (1995). Munn (1991) also developed the tropical canopy mist-netting using line shooting over tall trees.

2. Study Area

The study site is located 5.5 km off the junction to Gawi Jetty. It is located in Lake Kenyir. Lake Kenyir is situated in the district of Hulu Terengganu and borders the state of Pahang and Kelantan. It is also partially located in the National Park area. Lake Kenyir is the largest man-made lake, formed through the collection of water from the dam built in 1985. The lake's width is approximately 38,000 hectares with the catchment area of 2,590 kilometers wide (Busu, 1997).

According to Busu (1997), this area was originally hills and consists of a few small rivers that provide water to the Kenyir Dam, before the dam was built. When the dam was flooded, the lowland sunk and eventually formed 340 islands that can be seen in Lake Kenyir, now. Lake Kenyir also consists of 15 small rivers, 14 waterfalls; streams and is also home to various species of flora and fauna. Although it is not fully a natural recreational park as it consists of the Kenyir Dam, it has attracted many tourists from around the globe. Authorities at present have been playing their part to develop this area into a better recreational area that can attract more tourists. The vegetation structure of Sungai Buweh Lawit Waterfall, Lake Kenyir is the saraca-stream forest. The canopy structures cover most parts of the forest but a lot of forest gaps are available since it is a saraca-stream forest, which has rocky streams cascading in waterfalls down the hillsides and flows into tunnels through the forest. They are the smaller tributaries and the headwaters of our rivers unless their source be at great altitudes. We call them the Saraca-streams because they are bordered by Saraca-trees which must be counted among the more typical members of the Indo-Malaysian flora. We found the following characteristic of trees and shrubs with the Saracas (Corner, 1988).

Figure 1 The map of Lake Kenyir showing location of the study site



Source: Google map

3. Materials and Methods

During the study, direct and indirect methods were used to document the existence of birds in Sungai Buweh Waterfall Lawit, Lake Kenyir. Indirect methods include point count which consists of observation and vocalization while the direct method includes mist netting technique.

3.1. Point Count

Bibby et al. (1998) described the point count as a technique where an observer records all encountered individuals through observation and vocalization during a given time while remaining still at one location. Point count was chosen because it allowed observers to locate and observe rainforest birds by standing at a fixed location and time which aid in identifying birds that are difficult to spot. Point count is also beneficial as it is less disturbing to the area observed. To begin a starting point for each point count, a random compass bearing was chosen and marked. The intervals between each point count is 100m. The total distance of the point count is 1km with a total of 10 point count stations. Point count is usually done in a radius of 25m because it is not possible to observe species past this distance (Watson et al., 2004). Point count is usually done for a period of 10 minutes (Marsden et al., 2001). Point count was conducted twice a day, from 0630 hours until 1000 hours in the morning and 1600 hours to 1900 hours in the evening. The instrument used for point count is the Bushnell marine waterproof binoculars (7 x 42 magnifications).

3.2. Mist-netting

Mist net has contributed to the improvement of bird catching techniques over the years (Karr, 1979). According to Bibby et al.(1998), standard mist netting techniques can be practiced to survey the less noticeable species that is missed during point count. Nets were established by tying both ends on aluminium poles or trees. These nets can be operated at various heights. Five mist nets with four shelves, of 9 m long, 2.5 m high and 36 mm mesh size were placed at canopy level by using a slingshot and shoot over tall trees. Besides that, five mist nets with the measurement of 12 m long, 2.5 m high and 36 mm mesh size were placed at the understorey based on their accessibility, bird activities and the bird

flyways. Nets were opened from about 0630 hours to 1830 hours. The times depend on the weather conditions and mist nets will be closed in heavy rain conditions. Nets were checked every 2 hours and are closed before dusk. Nets data such as their height and GPS reading were recorded. Birds captured were placed in cloth bags before being measured and processed. The morphological data of captured birds were recorded. Information such as the total length, weight, tarsus length, bill length, bill width, bill depth, wing length, tail length, wingspan, brooding patch stage, moulting stage and the nets that they were captured were also recorded. Bird identification were guided by Robson (2002).

Mist netting result

Table 1 Mist netting results from Sungai Buweh, Tasik Kenyir

No.	Family Species Name	Common name	Number of indviduals	Habitat	Strata Level	IUCN Red List*
	Muscicapidae					
1	*Cyornis rubeculoides*	Blue-throated Flycatcher	1	Saraca-stream forest	Understorey (7m)	LC
2	*Culicicapa ceylonensis*	Grey-headed Canary Flycatcher	1	Saraca-stream forest	Understorey (7m)	LC
	Irenidae					
3	*Chloropsis cyanopogon*	Lesser Green Leafbird	2	Open forest	Understorey (3m)	NT
4	*Chloropsis sonnerati*	Geater Green Leafbird	1	Open forest	Understorey (3m)	LC
	Dicaeidae					
5	*Prionochilus percussus*	Crimson-breasted flowerpecker	2	Shrubs on roadside	Understorey (4m)	LC
6	*Prionochilus maculates*	Yellow breasted flowerpecker	1	Shrubs on roadside Open forest	Understorey (4m)	LC
7	*Dicaeum trigonostigma*	Orange-bellied flowerpecker	1		Understorey (3m)	LC
	Pycnonotidae					
7	*Alophoixus phaeocephalus*	Yellow-bellied bulbul	1	On top of tall trees	Canopy (17m)	LC
8	*Pycnonotus simplex*	Cream-vented bulbul	1	On top of tall trees	Canopy (17m)	LC
9	*Alophoixus bres*	Grey-cheeked bulbul	1	On top of tall trees	Canopy (17m)	LC
	Nectariniidae					
10	*Arachnothera longirostra*	Little spiderhunter	4	Open forest	Understorey (3m)	LC
11	*Hypogramma hypogrammicum*	Purple-naped sunbird	1	Shrubs on roadside	Understorey (4m)	LC
	Cuculidae					
12	*Surniculus lugubris*	Square-tailed Drongo Cuckoo	1	On top of tall trees	Canopy (17m)	LC
	Calyptomenidae					
13	*Calyptomena viridis*	Green Broadbill	1	On top of tall trees	Canopy (16m)	NT
		Total no. of species	13			
		Total no. of individuals	19			
		Total no. of family	7			

*LC: Least Concerned NT: NearThreatened IUCN Red List: International Union for Conservation of Nature Red List of Threatened Species, 2014

Table 2 Point count results from Sungai Buweh, Lake Kenyir

No	Family Species Name	Common Name	Number of individuals	Habitat	Strata Level	IUCN Red List
	Muscicapidae					
1	*Copsychus saularis*	Oriental Magpie Robin	11	Tree branch	Understorey (5m)	LC
2	*Copsychus malabaricus*	White-rumpedShama	5	Tree branch	Understorey (6m)	LC
	Acrocephalidae					
3	*Orthotomus ruficeps*	Ashy Tailorbird	1	Bushes (foraging)	Understorey (2m)	LC
	Pycnonotidae					
4	*Pycnonotus plumosus*	Olive-winged Bulbul	3	Foraging on trees	Understorey (5m)	LC
5	*Pycnonotus simplex*	Cream-vented Bulbul	1	Foraging in shrubs	Understorey (6m)	LC
6	*Pycnonotus finlaysoni*	Stripe-throated Bulbul	1	Perching on branch	Understorey (5m)	LC
7	*Pycnonotus goiavier*	Yellow vented Bulbul	1	Perching and foraging on tree	Understorey (7m)	LC
	Accipitridae					
8	*Spilornis cheela*	Crested Serpent Eagle	5	Perching on bare branch	Canopy (18m)	LC
	Meropidae					
9	*Merops viridis*	Blue-throated Bee-eater	18	Foraging on insect on branch	Understorey (5m)	LC
	Alcedinidae					
10	*Halcyon smyrnensis*	White-throated Kingfisher	4	Flying by across open area	Understorey (2m)	LC
	Corvidae					
11	*Corvus enca*	Slender-billed Crow	3	Perching on branch	Understorey (7m)	LC
	Rallidae					
12	*Amaurornis phoenicurus*	White-breasted Waterhen	3	Vocalization	Understorey	LC
	Picidae					
13	*Picus miniaceus*	Banded Woodpecker	2	Drilling on tree	Understorey (10m)	LC

14	*Reinwardtipicus validus*	Orange-backed Woodpecker	1	Flying over from tree to tree	Understorey (9m)	LC
	Cuculidae					
15	*Centropus sinensis*	Greater Coucal	5	Flying from shrubs to shrubs	Understorey (5m)	LC
	Nectariniidae					
16	*Anthreptes simplex*	Plain Sunbird	2	Foraging on melastoma shrubs	Understorey (3m)	LC
17	*Nectarinia zeylonica*	Purple-rumped Sunbird	1	Foraging on melastoma shrubs	Understorey (2m)	LC
	Dicaeidae					
18	*Prionochilus xanthopygius*	Yellow-rumpedFlowerpecker	2	Foraging in melastoma shrubs	Understorey (3m)	LC
19	*Dicaeum chrysorrheum*	Yellow vented Flowerpecker	1	Foraging in melastoma shrubs	Understorey (4m)	LC
20	*Dicaeumcruentatum*	Scarlett-backed Flowerpecker	2	Foraging in melastoma shrubs	Understorey (3m)	LC
21	*Prionochilus maculates*	Yellow-breasted Flowerpecker	2	Perching on branch	Understorey (4m)	LC
	Bucerotidae					
22	*Aceros corrugates*	Wrinkled Hornbill	3	Perching on branch	Canopy (30m)	NT
23	*Buceros vigil*	Helmeted Hornbill	2	Perching on tree branch	Canopy (28m)	NT
24	*Rhyticeros undulates*	Wreathed Hornbill	3	Flying across the lake	Canopy (20m)	LC
25	*Anthacocerus malayanus*	Asian Black Hornbill	1	Flying	Canopy (25m)	NT
26	*Bucerous bicornis*	Great Hornbill	2	Flying in pairs	Canopy (27m)	NT
27	*Anthracoceros albirostris*	Oriental Pied Hornbill	5	Flying across the lake	Canopy (18m)	LC
28	*Buceros rhinoceros*	Rhinocerous Hornbill	1	Flying across tree to tree	Canopy (30m)	NT
29	*Aceroscomatus*	White-crowned Hornbill	2	Flying pairs	Canopy (22m)	NT
	Phasianidae					
30	*Gallus gallus*	Red Jungle Fowl	1	Vocalization	Understorey	LC
	Oriolini					
31	*Oriolus chinensis*	Black-naped Oriole	1	Perching on branch	Canopy (15m)	LC
	Chloropseidae					
32	*Chloropsis cyanopogon*	Lesser Green Leafbird	1	Foraging in shrubs	Understorey (3m)	NT
	Calyptomenidae					
33	*Calyptomena viridis*	Green Broadbill (Figure 1)	1	Perching on branch	Canopy (15m)	NT
		Total no. of species	33			
		Total no. of observations	97			
		Total no. of family	17			

LC: Least Concerned NT: Near Threatened

Source: International Union for Conservation of Nature Red List of Threatened Species, 2014

4. Species Account

There are some notable species found in Sungai Buweh Lawit Waterfall, Lake Kenyir:

1. Drongo Cuckoo (*Surniculus lugubris*): 2014 IUCN Red List Category (as evaluated by BirdLife International – the official Red List Authority for birds for IUCN): Least Concern. This is the most commonly heard cuckoo in primary forest. Mimics appearance of drongos but differs in having white markings on underside of tail and beak is small without hooked end. Some even have white nape patch. Possibly a breeding visitor to some northern areas. It is brood-parasitic. Laid in nests of Sooty-capped, Horsefield's and Chestnut winged Babblers, Striped Tit Babblers and Nepal Fulvetta. This species' current population trend is decreasing.

2. Crested Serpent Eagle (*Spilornis cheela*) (Figure 2): IUCN listed as Least Concern as evaluated by BirdLife 2012 and CITES Appendix II. This species' current population is stable. This raptor is South-east Asia's commonest most widespread forest raptor. It feeds on snakes and lizards; birds and rats.

3. Wrinkled Hornbill (*Aceros corrugatus*): IUCN listed as Near Threatened as evaluated by BirdLife 2012 and CITES Appendix II. This species' current population is decreasing. The commonest hornbill in the peat swamp forest (Phillips *et al*, 2014) and non-territorial.

4. Helmeted Hornbill (*Buceros vigil*): IUCN listed as Near Threatened as evaluated by BirdLife 2014 and CITES Appendix II. This species' current population is decreasing. This is the rarest hornbill. Uncommon in lowland and hill forest. Has heavy solid ivory bill used in aerial clashing in marking territory and feeding.

5. Wreathed Hornbill (*Rhyticeros undulatus*): IUCN listed Least Concern as evaluated by BirdLife 2012 and CITES Appendix II. This species' current population is decreasing. It is semi-nomadic, wide ranging and non-territorial

6. Asian Black Hornbill (*Anthracoceros malayanus*): IUCN listed Near Threatened as evaluated by BirdLife 2012 and CITES Appendix II. This species' current population is decreasing. More often found inland and in hill forest compared to Oriental Pied Hornbill. Territorial.

7. Great Hornbill (*Buceros bicornis*): IUCN listed Near Threatened as evaluated by BirdLife 2013 and CITES Appendix II. This species' current population is decreasing. It is not the largest but probably the biggest and heaviest hornbill of the region and found in small flocks.

8. Oriental Pied Hornbill (*Anthracoceros albirostris*) (Figure 3): IUCN listed Least Concern as evaluated by BirdLife 2012 and CITES Appendix II. This species' current population is stable. More common in island and coastal and secondary forests compared to other hornbills. Usually seen in flocks but pairs will separate when breeding.

9. Rhinocerous Hornbill (*Buceros rhinoceros*): IUCN listed Near Threatened as evaluated by BirdLife 2012 and CITES Appendix II. This species' current population is decreasing. It is heavily hunted for feathers used in traditional ceremonies.

10. White-crowned Hornbill (*Berenicornis comatus.*): IUCN listed Near Threatened as evaluated by BirdLife 2012 and CITES Appendix II. Tis species' current population is decreasing. The rarest and most carnivorous of the hornbills. Hunts in parties of 4-6 for insects and small animals.

As almost all the hornbill species in Malaysia and various other birds can be found in Lake Kenyir, it is therefore suitable to build a sanctuary along the lake especially in the geopark area. This sanctuary can contribute to the ecotourism and educational sector. Birdwatching along Lake Kenyir will give birdwatchers a wide opportunity to get an up-close experience on the bird species and to study their behaviour.

According to Weaver (1998), nature-orientated tourism destinations are often located in ecologically rich but economically poor areas. Conservation efforts are often required in these areas but they lack the financial resources to maintain these area (Gossling, 1999; Scheyvens, 1999; Butcher, 2006). Weaver (1998) studied that over a 13-years period (1982 – 1995), bird-watching activity has increased in popularity by 155 percent. Data and information from several sources can contribute to the economy at a national level. Pullis La Ronche (2002) stated that according to the 2001 national survey, birders will spend over $31billion in retail sales while participating in wildlife watching activities such as bird-watching. This can bring a huge impact on the country's economic growth.

The rainforest along the lake is crucial as a shelter and source of food for the hornbills and other birds. Therefore, it is important for an aviary to be developed in this area to sustain the forest and the birds that depend on its resources. Through this sanctuary, 6 of the 8 hornbills observed here and at risk due to its IUCN status being Near Threatened can be saved and protected from illegal poachers. Also, people will gain more knowledge of these hornbills which serve not only as an important pollinator but also an important ecology indicator that maintains and balances our ecosystem.

5. Conclusion

The study obtained 18 individuals from 12 species that represents 6 families from the mist net method while 96 observations discovered 32 species representing 16 families from the point count method. Lake Kenyir is an area rich with tropical rainforests, wildlife, wild plants such as wild orchids, birds, fungi, and fishes. There are 285 species of birds in Kenyir Geopark (Sharoum*et* al., 2015). Malaysia has 10 species of hornbills and 9 can be found in Kenyir Geopark (Sharoum*et al*., 2015). Six of the hornbill species are considered Nearly Threatened (NR). Due to the richness of the bird species, birdwatching activity has become one of the common activities conducted around Kenyir Geopark. Thus, there is a high potential in developing birdwatching activity as an important ecotourism activity in Kenyir Park.

6. Recommendations

To ensure the sustainability of Lake Kenyir Geopark, future in-situ and ex-situ conservation actions should be taken. Governments, private sectors and local communities must all join forces to promote and expand ecotourism activities successfully. Therefore, proper management and the utilization of natural resources is vital.

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APPENDIX

Figure 1 Green Broadbill (male)
Photo Courtesy to Gertrude David

Figure 2 Crested Serpent Eagle
Photo Courtesy to Tinna Wound

Figure 3 Oriental Pied Hornbill (female)
Photo Courtesy to Tinna Wound

REPTILE DIVERSITY AS AN ECOTOURISM ATTRACTION IN PULAU BIDONG

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ABSTRACT

Pulau Bidong is located off the coast of Terengganu and is accessible from the coastal town of Merang. Only a few tourists come here, mainly due to the lack of attractions as it is commonly known for its history as a refugee camp only. However, recent survey by a group of researchers from Universiti Malaysia Terengganu found that Pulau Bidong is a home to a number of reptile species such as *Bronchocela cristatella, Eretmochelys imbricata, Dasia olivacea* and *Gekko gecko.* There is also a species of rock gecko that is endemic to this island, *Cnemaspis bidongensis*. Based on this finding, reptile-spotting activity is proposed to be one of the ecotourism attractions in Pulau Bidong. Reptile-spotting may help to reduce environmental pressure caused by water-based activities, educate tourist regarding importance of reptiles and provide benefits towards local communities.

Keywords: Ecotourism, Pulau Bidong and reptiles.

1. Introduction

The small islands along the coast of Peninsular Malaysia are heavily forested and expected to hold significant ecological function (Cronk, 2001). These islands harbor endemic, endangered and migratory species as previously found on similar forested islands in Southeast Asia (Turner et al., 2002). However, studies and research on numerous forested islands surrounding Peninsular Malaysia are still scarce, as most of them centered on the marine biodiversity and activities. Terrestrial resources of these islands have not been fully assessed, therefore, the ecological and economic importance of its forests have not yet been fully evaluated.

Pulau Bidong is one of the under-studied islands situated off the coast of Terengganu, Malaysia mainly due to the lack of attractions; Pulau Bidong is commonly known for its history as a refugee camp only. However, a recent survey by a group of researchers from Universiti Malaysia Terengganu found that Pulau Bidong is more than its historical values; it is a home to diverse range of fauna species, especially reptiles.

It has been reported that 397 species of reptiles were recorded around Malaysia and among them, an approximate of 256 species were identified to be present in Peninsular Malaysia (Das & Norsham, 2007). Despite this remarkable diversity, reptiles do not play a prominent role in scientific studies and research in our country. Hence, only a few studies have been published on the population, community structure and other aspects of reptilian ecology. This is most likely due to the lack of understanding of the significance of these vertebrates in the ecological processes of an ecosystem.

Therefore, the diversity of reptiles in Pulau Bidong should be highlighted to spark interest among researchers and also public regarding reptiles in Malaysia. Besides educating people, this effort may help to develop our tourism industry which has been recognized as a significant contributor towards the improvement of basic infrastructure, the growth of domestic industries, and proliferation of foreign investment. More importantly, tourism facilitates the preservation and conservation of the environment and its local diversity.

2. Objectives

This study aims to explore the potential to promote Pulau Bidong's terrestrial biodiversity, especially reptiles, as one of the main ecotourism attractions, thus providing a more holistic ecotourism experience for the tourists. For that reason, a brief field survey was conducted to assess the composition of reptiles in this island.

3. Methodology

A field sampling was conducted in a secondary, coastal forest of Pulau Bidong (05º37.139' N 103º 03.494' E) (Figure 1), starting from 31st May to 7th June 2015.

Figure 1 The map shows the location of the sampling site in Pulau Bidong, Terengganu

Pitfall trapping was used to collect samples passively. Buckets with approximately 25cm in heights were used, together with drift fences to increase the probability of individuals to fall into the pitfall traps. Each bucket has small drainage holes and a small amount of leaf litter, to provide cover for the trapped reptiles and potentially to attract invertebrates as bait. A little amount of water was put inside each bucket to make the walls slippery thus preventing the individuals caught from crawling out of the buckets. All soil excavated was removed away from the traps to reduce disturbance that may deter some animals. The traps were checked twice daily at approximately 09:00 and 18:00.

Besides passive method, active searching was also conducted to spot and collect more reptiles. Active searching was carried out three sessions per day (in the morning, evening and during night time) along minimum 1km transects, around two to three hours per session. Visual Encounter Surveys (VES) were done during active searching sessions; all observed reptile species were recorded and captured, if possible, using sweep nets, hand-picking device, or simply by hand grabbing. The morphological measurements and diagnostic features of each reptile caught were recorded and identified based on Das (2002; 2004 & 2010) and Grismer (2006).

4. Results and Discussions

One of the major tourism problems faced by Malaysia is the high dependency on one single market which means that most of the international arrivals to Malaysia are from the same country or region due to a specific factor (Fathilah & Turner, 2008). Sudden drop in the factor that influences the tourism market of that particular country will affect our tourism growth greatly; therefore, it is important for Malaysia to diversify its market in order to sustain the tourism industry in the long run. Terrestrial biodiversity especially reptiles should be promoted as one of the tourism attraction in Malaysia, in this case, in Pulau Bidong. A total of 13 reptile species representing five families were recorded in Pulau Bidong (Table 1). The Gekkonidae family has the highest species representation with eight species present.

Most of the tourists in Pulau Bidong were there to enjoy water-based activities such as scuba-diving, snorkeling, and swimming. However, these types of activities are assumed to have a negative impact towards the marine biodiversity if they are not properly managed. Diana et al. (2015) conducted a survey in Pangkor Island which revealed that majority of the local residents who are highly dependent on tourism activities are concerned with the physical environmental impacts

caused by inexperienced scuba divers and high intensity of snorkelling activities. Reptile-spotting is an alternative way for a tourist to be close to nature without causing harm towards the natural environment. *Gekko gecko* (Figure 2), *Dasia olivacea* (Figure 3), *Bronchocella cristatella* (Figure 4) and *Cnemaspis* are among interesting reptile species that can be observed in Pulau Bidong. Most of the reptiles can be easily spotted around the island; on buildings, on tree trunks and branches and on leaf litter scattered throughout the forest. The result of this study serves as a basic review of the reptile species available on this island. Extensive field sampling covering wider area should be conducted to explore and discover more species.

According to Mohd. Hafiz et al. (2013), tourism activities should provide benefits towards local residents as their involvement is significant to maintain the robust growth of tourism industry. Increase of tourism activities due to additional attraction in Pulau Bidong that is reptile-spotting will also benefit local community of the coastal area of Terengganu in terms of providing more economic or employment opportunities, especially in transportation and accommodation services. Other advantages include improvement of infrastructure and facilities, and to spread awareness among the community regarding preservation of natural resources.

Table 1 List of reptiles found in Pulau Bidong together with their conservation status.

Species	Common name	Status		No. of individuals captured
		IUCN	WCA (2010)	
Cheloniidae				
*Eretmochelys imbricata**	Hawksbill Sea Turtle	CR	-	-
Agamidae				
Bronchocela cristatella	Crested Green Lizard	-	-	4
Gekkonidae				
Cnemaspis bidongensis	Pulau Bidong Rock Gecko	-	-	3
Gekko gecko	Tockay	-	Protected	5
Gekko monarchus	Warty House Gecko	-	-	1
Hemidactylus frenatus	Asian House Gecko	LC	-	7
Hemidactylus garnotii	Garnot's House Gecko	-	-	1
Hemidactylus platyurus	Frilly/flat-tailed House Gecko	-	-	5
Lepidodactylus lugubris	Common Mourning Gecko	-	-	1
Ptychozoon lionotum	Smooth Parachute Gecko	LC	-	1
Scincidae				
Dasia olivacea	Olive Tree Skink	LC	-	4
Eutropis multifasciata	Common Sun Skink	-	-	4

Varanidae				
*Varanus salvator**	Water Monitor Lizard	LC	Protected	-
			TOTAL	**36**

* Visual encounter survey
CR - critically endangered
LC– Least concern

Figure 2 *Gekko gecko* or Tockay can be spotted day and night on tree trunks as well as human habitations. Photo: Aisyah@2015

Figure 3 *Dasia olivacea*, Olive Tree Skink, often dwells in canopy layer.
Photo: Amirah@2015

Figure 4 *Bronchocella cristatella* camouflaged itself among the green leaves.
Photo: Amirah@2015

5. Conclusion and Recommendations

Baseline ecological survey work in Pulau Bidong is vital to evaluate the impacts of tourism on the natural resources to ensure the sustainability of the islands and prevent further ecosystem degradation. The number of tourists to this natural area must also be monitored and managed to avoid unnecessary pressure on natural wildlife ecosystems. Efforts to outsource or actively promoting the information and awareness on the rich terrestrial biodiversity of Pulau Bidong to local stakeholders and tourists should be multiplied.

According to Gardner (2001), the number of amphibians and reptiles around the world has declined rapidly due to various factors such as habitat destruction or direct modification, ultraviolet radiation, acidification and other chemical pollutants, diseases and also changes in climate and weather. Apart from providing exciting educational tourism, it is hoped that reptile-spotting activity will attract researchers to conduct reptile studies in Pulau Bidong thus contributes to the reptile biodiversity inquiry in Malaysia. The information obtained can be used for long-term monitoring purposes or to assist future herpetofauna conservation programs.

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ESTABLISHING A LINK BETWEEN BEE CONSERVATION AND ECOTOURISM

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ABSTRACT

Bees are believed to be one of the dominant pollinators in the pollination of plants including some economic crops besides attaining their honey and wax. However, due to the lack of awareness on bee conservation, they are now facing threats from anthropogenic activities. Ecotourism can be one of the ways in conserving and preserving bees in Malaysia. This study was conducted to identify bee species that can be found in Kenyir and how the bee conservation and ecotourism are linked to each other. The bees inventory was conducted for 25 sampling days in five localities in the Kenyir area. Bees were sampled using 20 baited traps and aerial net on one to two kilometres sampling transect. From the study, a total of 34 species of bees had been recorded where Apinae records the highest number of species. All the recorded species from the inventory in Kenyir have their own roles and importance in the ecosystem. Through ecotourism, the forest that provides floral resources and habitat for the bees can be protected and preserved which would indirectly protect the bees.

Keywords: Bees, ecotourism, pollinator, forest and beekeeping.

1. Introduction

The tropical rainforests in Southeast Asia is one of the biodiversity hotspots as it consists of diverse animal species and has an abundance of different trees. However, the anthropogenic activities have led to the increasing rate of deforestation in the area (Sodhi, 2002; Castelletta et al., 2005; Sodhi & Brooks, 2006; Sodhi et al., 2010; Bing et al., 2013). Malaysia is known with its diverse rainforests such as the dipterocarp forest, peat swamp and mangrove forests which contributes to the diversity and abundance of flora and fauna in this country. In Kenyir, most of the forest consists of Dipterocarp forests where it is dominated by trees from the Dipterocarpaceae family, which are high economic timber trees.

Bees are believed to be one of the dominant pollinators in the tropical forest. In Malaysia, bees particularly the stingless bees have become one of the popular pollinator in agricultural crops. The bees and plants relationship are very significant in the ecosystem in a way that it benefits both and enables them to survive. Bees are important in the pollination of plants including some economic crops besides providing honey and wax. For instance, Inoue et al. (1990) and Liow et al. (2001) stated that about 74% of insects visiting the flowers in Sumatra are commonly the Apid bees. In India, the *Apis dorsata* is the main pollinator of the endangered dry forest trees, *Pterocarpus santalinus* (Fabaceae) while in Lambir, Sarawak, about 15 species of canopy and emergent trees were pollinated by this species (Corlett, 2004). However, due to the lack of awareness in bee conservation, they are now facing threats from anthropogenic activities such as habitat fragmentation and loss, invasion of introduced species and pesticide use (Hopwood, 2008).

According to Ceballos-Lascurain (1996), ecotourism can be defined as travelling and visiting to a relatively undisturbed natural area to appreciate and enjoy its nature, minimize visitors' impact and the involvement of the local community (Samdin, 2008). The main attraction in Malaysia includes the rainforests, wildlife and the scenic beauty. In Malaysia, ecotourism mainly involves the marine ecosystems, tropical rainforests and wetland ecosystems (MOSTE, 1998; Samdin, 2008).

Due to that reason, ecotourism can be one of the ways in promoting bee conservation in Malaysia by reducing the clearing of forest for agriculture, mining and industrial purposes. Apart from that, the conservation of forest for ecotourism purposes may help in protecting the bees nest and their habitat. This study was conducted to identify the bee species that can be found in Kenyir and how bee conservation and ecotourism are linked to each other.

2. Methodology

2.1. Study area

The inventory was conducted from March 2015 to July 2015 amounting to 25 sampling days. The bees were sampled at five localities in Kenyir namely, Tanjung Mentong (4°54'7.78" N, 102°43'28.78" E), Sungai Buweh Waterfall (5°8'52.02" N, 102°46'8.53" E), Belukar Bukit (4°53'51.22" N, 102°59'35.09" E), Sekayu Waterfall (4°57'56.85" N, 102°57'16.66" E) and Hutan Simpan Hulu Telemong (5°13'45.3" N, 102°50'7.4" E). All the areas consist of lowland dipterocarp forest where most of the tree species come from the family Dipterocarpaceae. Tree species such as the *Dipterocarpus* sp. (*Keruing*) and *Shorea* sp. (*Meranti*) are examples of Dipterocarpaceae trees that have high timber value. Some shrubs such as *Melastoma malabathricum*, *Mimosa pudica*, *Lantana camara* and *Asystasia intrusia* can also be found abundantly at the edge of the forest. Apart from that, these areas are also a part of the ecotourism area in Kenyir.

2.2. Methods

The native bees were collected by active searching using aerial net along a one to two-kilometre sampling transects for each sampling day. Apart from that, a total of 20 baited traps were also set up to collect the bees and ripen pineapples were used as bait. Baited traps were set up randomly in the forested areas. The bees were identified until the species level based on their morphological characteristics with reference to Michener (2007), Inoka et al. (2008), Abang & Hill (2010) and Jalil & Shuib (2014). The collected bees were preserved as dry specimens and deposited in the Centre for Kenyir Ecosystems Research Museum.

3. RESULT

A total of 34 species of bees from two families, the Halictidae and Apidae have been identified from the five study areas in Kenyir (Table 1). Nine other morphological species had not been identified yet due to lack of references. Based on results as shown in Figure 1, Apinae records the highest number of species with a record of 18 species (53%), followed by Xylocopinae with a record of 12 species (35%). Other sub families were the Nomiinae (3 species) and Halictinae (1 species).

Table 1 Bee species recorded in Kenyir.

Family	Subfamily	Tribe	Species
Halictidae	Nomiinae		*Nomia strigata*
			Nomia sp.
			Pseudapis sp.
	Halictinae	Halictini	*Lasioglossum* sp.
Apidae	Xylocopinae	Xylocopini	*Xylocopa aestuans*
			Xylocopa caerulea
			Xylocopa dejeanii
			Xylocopa flavonigrescens
			Xylocopa latipes
			Xylocopa varipuncta
			Xylocopa sp.
		Ceratinini	*Ceratina* sp.
			Ceratina collusor
			Ceratina nigrolateralis
			Ceratina smaragdula
			Ceratina unimaculata
	Apinae	Anthophorini	*Amegilla insularis*
			Amegilla zonata
		Melictini	*Thyreus himalayensis*
		Meliponini	*Heterotrigona erythogastra*
			Heterotrigona itama
			Geniotrigona thoracica
			Lepidotrigona terminata

	Lophotrigona canifrons
	Tetragonilla atripes
	Tetragonilla collina
	Tetrigona sp.
	Tetragonula sp.
	Tetragonula fuscobalteata
	Tetragonula laeviceps
	Tetragonula melina
	Tetragonula geissleri
Apini	*Apis cerana*
	Apis dorsata

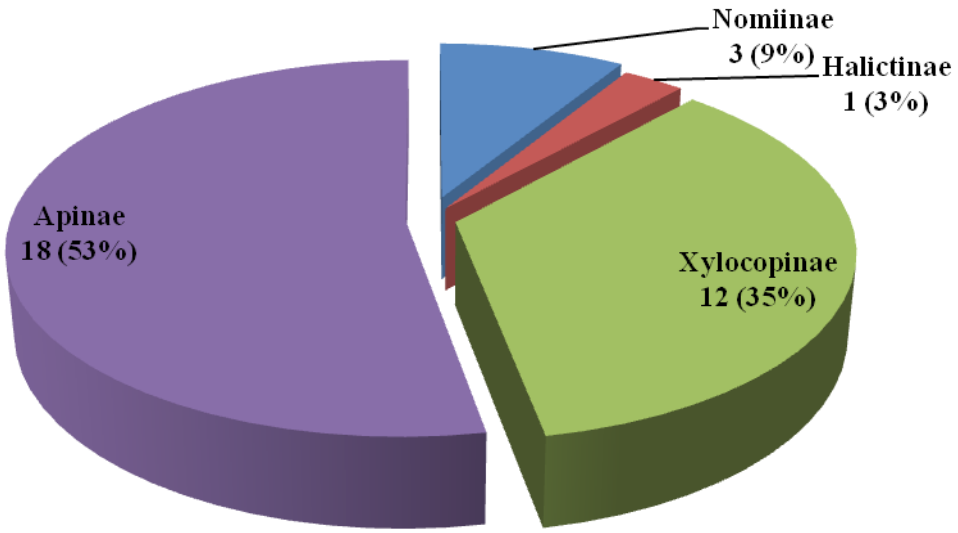

Figure 1 Subfamily -level classification of bees species in Kenyir (n= 34 species).

Apart from that, six stingless bees nests were found at five study areas. The nest of *Tetragonilla collina*, *Lepidotrigona latipes*, *Heterotrigona itama*, *Geniotrigona thoracica*, *Tetragonula laeviceps* and *Lepidotrigona terminata* were found on different trees species namely, the *Shorea* sp., *Ficus* sp. and *Saraca thaipingensis*.

4. Discussion

From the results, the high number of species recorded from Apinae was due to the Dipterocarp forests found in the study area. Most of tree species from the Dipterocarpaceae family can be found abundantly in the area. According to Eltz et al. (2003), most of the stingless bees nests were found on these tree species. Bees in particular the stingless bees species were likely to build nest on large trees and the abundance of stingless bees will increase with the number of larger trees in the area (Inoue et al., 1990; Liow et al., 2001). Stingless bees use resin and sap secreted from most of the Dipterocarp trees for their nest mainly for pollen pots, honey pots, nest entrance tubes and nest lining walls (Jalil & Shuib, 2014).

Apart from that, bees play an important role in the ecological processes which is pollination. About 80% of flowering plants are dependent on insects for pollination and reproduction, with half of the insect pollinator in the tropical forests are known as bees (Bradbear, 2009). Based on Table 1, all the recorded species play an important role in the ecosystem. Honey bees (e.g: *Apis dorsata*) and stingless bees (e.g: *Lepidotrigona terminata*, *Heterotrigona itama*) are social bees which pollinate flowers with brush-like, rotate or cup-shaped and yellow or white in colour (Momose et al., 1998). Meanwhile, carpenter bees (e.g: *Xylocopa* spp.) usually visit flowers with long pistils and can mostly be found in open areas and forest edges (Momose et al., 1998). Those described flowers referred to the *Shorea* sp., *Ficus* sp., *Saraca thiapingeensis* and *Melastoma malabathricum* where they were abundantly found in Kenyir. Thus, without bees, there would be no variety of trees that can be found in forest areas.

However, the diversity and abundance of wild bees were reducing in many parts of regions (Potts et al., 2010; Leonhardt et al., 2013; Ollerton et al., 2014; Sirohi et al., 2015). This is due to anthropogenic activities such as extensive land use, agriculture, pesticide, invasive species, and pathogens. To overcome these problems, Kurdoglu and Albayrak (2013) had suggested that ecotourism can be one of the effective tools in conserving and preserving biodiversity.

Based on the ecotourism definition, there are three principles to describe ecotourism: reduce the impacts at the visited areas, provide ecological education to the visitors and the involvement of the local communities (Wunder, 1999). According to Isaacs (2000), ecotourism can help in conservation by creating public awareness towards the environment, alert the tourists on the significance of nature and its processes and to lessen the negative impacts of human activities at the natural areas. Thus, ecotourism in the natural forests can help to promote the protection of the forest which plays an important role in the ecosystem such as carbon storage, watershed protection, erosion and home to numerous flora and fauna including bees. The trees, mainly the Dipterocarp forest can be protected from being destroyed through illegal logging activities as these trees provide habitat and food sources for the bees and other important fauna. Indirectly, it helps in conserving and protecting of the bees from declining.

Apart from being important pollinators, the bees also contribute to the ecotourism industry. The pollination processes help to generate and restore again the disappearing forest as most of the ecotourism activities in Malaysia are dominated by activities in the rainforests. Without bees, the pollination processes will not be done effectively and the trees cannot be pollinated. Thus, the forests mainly the area for the ecotourism will decrease in the future.

Besides, stingless bees have the highest number of species recorded in Kenyir. In Malaysia, stingless bees are currently well known in the beekeeping industry which also contributes to the ecotourism industry. The beekeeping industry is one of the ecotourism activities which contribute to the economic revenue. The involvement of the local communities in the beekeeping industry helps to increase their income. Apart from that, the local community also benefited from the ecotourism activities held at this beekeeping industry as they can be hired as nature guides to support the industry where they tend to have knowledge on the areas (Wunder, 1999).

5. Conclusion

Bee and ecotourism are indirectly related to each other. From the study, a vast diversity of bees species can be found in Kenyir and most of them are important and significant to the ecosystems. The forest ecotourism area provides habitat and trees that provides floral resources for bees to survive. In exchange, bees help to pollinate the trees which help to regenerate the diversity of forest trees. Without flowering trees, there would be no bees. Without bees, there would be no flowering trees and plants. Without trees and plants, no ecotourism activities can be conducted.

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BAT ECOTOURISM POTENTIAL AT WIND CAVE NATURE RESERVE, SARAWAK THROUGH BAT CONSERVATION STUDY

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ABSTRACT

The study conducts roost site mapping, roost sites preferences, bat assemblage and bat acoustic call at the Wind Cave Nature Reserve (WCNR) from 2013 to 2015. The area lack information on bats and the existing information has not been updated for quite some time. The study utilizes the non-consumptive method that uses observation, data logger and the wildlife acoustic song meter to collect data. The data obtained are important as baseline data for future management and conservation of the bats species at the WCNR. This information also provides additional interesting information to tourists. This paper is a collection of the ecological studies of cave-dwelling bats that have been conducted at the WCNR. The findings from the study such as species list; and a map that show the location of the bats and their roost sites preferences can help increase awareness towards the conservation of bats at WCNR to promote better ecotourism benefit.

Keywords: Wind Cave Nature Reserve, roost site mapping, echolocation, roost site preferences and bat assemblage.

1. Introduction

Bats are distinguished from other mammal by their wing ability to conduct true flight. They are the second largest order in the class of Mammalia after Rodentia in term of biodiversity (Corbet & Hill, 1992; Jones et al., 2002). It has a wide distribution across the world due to its flight capability. Apart from that, its diverse feeding, roosting habits, social behavior and reproductive strategies also contribute to its broad distribution (Amsyari, 2014).

Cave ecosystem is known to support colonial species that choose their roosting site based on the ability of the selected roosting site to hold large number of individuals. A total of 54% of bats in Borneo are cave dwellers and these species use caves as their main or occasional roosting sites (Payne et al., 1985; Rahman et al., 2011). Fruit bats play an important role as pollinators, as well as providing guano that becomes a source of energy for the cave ecosystem. Insectivorous bats also inhabit caves and feeds on many of the insects that are harmful to crops.

Malaysia has a total landmass of 329,847 square kilometers, a population of 25 million and it is divided into two regions, which are the West Malaysia (peninsular) and East Malaysia (Borneo). Malaysia has the potential of becoming the top ecotourism destination as it is one of the world's 12 mega diversity. In the Borneo region, the state of Sarawak has 30 national parks, 4 wildlife sanctuaries and 10 nature reserves. These protected areas cover a total area of 837,553.80 ha (land area and water body). Currently, there are 15 totally protected areas including WCNR that is opened to the public and it is one of the major tourist attraction that keeps visitors coming back to the state.

The main attraction at the WC is the large colony of fruit bats, *Penthetor lucasi,* which is the dominant species roosting in the cave. Thousands of *P. lucasi* can be easily seen and identified using reflected lights on its conspicuous eyes. Bat diversity gradually changes as it goes deeper inside the cave. The WC supports a high diversity of bat species. However, the WCNR is often crowded with visitors during peak season such as public holiday and weekends. It also receives many local and foreign tourists who are bats and cave enthusiast. Their presence threaten the bats existence and habitat. Therefore, the objective of this paper is to obtain data that will be used to create conservation awareness on bats by providing additional information to tourists. Through the effort, tourists can learn a lot more about the ecology of the bats and give them more appreciation.

2. Methodology

2.1. Study site

The study of bats ecology at the WCNR has been conducted since 2001 by many researchers. The Wind Cave Nature Reserve (1° 24.915' N and 110° 08.109' E) is located in Bau, Sarawak. It covers an area of 6.16 hectares that includes the cave and its surrounding forest (Sarawak Forest Department, 1992). The main features of the Wind Cave (WC) are stalactites, stalagmites, limestone pendants lynching from the roof of the cave passage, conical cavities alienated by blade-like pinnacles of limestone and current scallops, which have a honeycomb manifestation. These indicate the direction of the water flow (Sarawak Forest Department, 1992). The WCNR was chosen as the study site because this cave harbors a large number of bats species and is a vital area for bats (Qhairil, 2014).

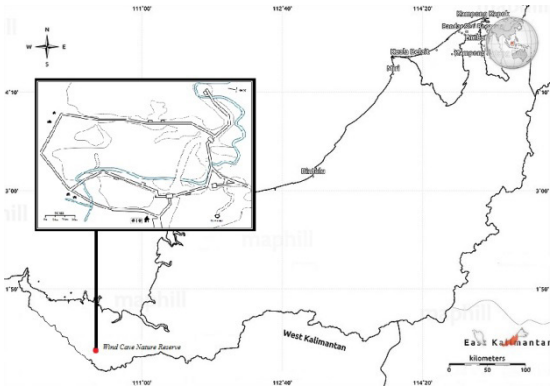

Figure 1 Map of Wind Cave
Source: Qharil, 2014

2.2. Data Collection

During the day, the ocular observations were conducted along the passages in the cave to determine the roosting site of the bats. Mapping and observation of the cave were conducted around 0900 hours. Once the roost site is spotted, the location is marked on the map of the cave. After identifying the bats' roosting sites, the identification of the bat's species was conducted. The identification of the bats species was conducted using the bat detector (Echometer EM3), digital camera (Nikon D3200) and a hand net. The bat detector (Echometer EM3) was used to identify species as it reads the frequency transmitted by the bats. Bats were sampled using harp trap and mist nets that were placed at ground level across the trail and stream. Bats were release after standard measurements such as the forearm (FA), ear (E), tragus (Tra), tibia (TB), hind foot (HF), tail (T), head and body length (HB), and total length (TL), weight (Wt) and echolocation call were recorded.

After the species were identified, the HOBO data logger (records temperature and humidity) was set at the roosting sites. The data logger was placed near the surface of the cave ceiling. For each roost site, the data logger was left for twelve hours (0600 – 1800) and the readings were taken every two hours. In some cases, the voucher specimens were taken and preserved in 70% ethanol for taxonomic and genetic studies. The specimens are kept in the museum library at Universiti Malaysia Sarawak (Rahman et al., 2011; Julius, 2014; Amsyari, 2014; Qhairil, 2014; Hasrul, 2015).

3. Result

3.1. Bat assemblage at WCNR

In terms of bat diversity, previous studies conducted since 2001 to the present study have recorded 28 species of bats. From the 28 bat species recorded, 11 were found roosting inside the cave (Qhairil, 2014).

Table 1 Species found in WCNR

#	Family Species	Present study, 2015	Julius, 2014	Mohd-Ridwan et al., 2011	Hall et al., 2001
	PTEROPODIDAE				
1	*Cynopterus brachyotis*		+	+	+
2	*Cynopterus horsfieldii*				
3	*Penthetor lucasi* *	+	+	+	+
4	*Balionycteris maculata*		+	+	+
5	*Eonycteris spelaea*		+	+	
	EMBALLONURIDAE				
6	*Emballonura alecto*		+		
	RHINOLOPHIDAE				
7	*Rhinolophus arcuatus*		+		
8	*Rhinolophus borneensis**	+	+	+	+
9	*Rhinolophus affinis**	+	+	+	+
10	*Rhinolophus luctus* ***	+			
	NYCTERIDAE				
11	*Nycteris tragata*		+		
	MEGADERMATIDAE				
12	*Megaderma spasma**		+	+	
	HIPPOSIDERIDAE				
13	*Hipposideros diadema**	+	+	+	+
14	*Hipposideros larvatus**	+	+	+	
15	*Hipposideros ater***		+		
16	*Hipposideros bicolor*		+		
17	*Hipposideros coxi**	+	+	+	
18	*Hipposideros ridleyi*		+	+	
19	*Hipposideros galeritus**	+	+	+	
20	*Hipposideros cervinus**	+	+	+	+
	VESPERTILIONIDAE				
21	*Kerivoula pellucida*		+	+	
22	*Kerivoula hardwickii*		+		
23	*Kerivoula papillosa*		+		
24	*Myotis ater*		+		
25	*Myotis horsfieldii**	+	+	+	+
26	*Myotis montivagus*	+	+		
27	*Tylonycteris robustula*		+		
28	*Tylonycteris pachypus*		+	+	

Note: *Found roosting inside the cave; **Cave-dweller (Payne *et. al.*, 1985); ***New recorded species

3.2. Roost Site Mapping

Inside the WCNR, a total of 11 species of bats are known to roost in it. Among the species are *P. lucasi. Megaderma spasma, Rhinolophus borneensis, R. affinis, Hipposideros diadema, H. larvatus, H. cervinus, H. galeritus, H. coxi* and *Myotis horsfieldii.* The most abundant species roosting in the cave in terms of population size is *P. lucasi,* which is estimated to be 699,191 individuals with an average density of 307.2 bats/m^2 from a total of 227.6 m^2 roosting site observed (Akmal-Syafriq, 2015).

3.3. Roost Site Preferences

3.3.1. Temperature and humidity

Out of these ten species, *P. lucasi* has the widest temperature range (±1.96) and *R. borneensis* has the smallest temperature range (±0.28). The *M. spasma* roost at the high temperature roosting site (=26.50) and *H.diadema* roost at the lowest temperature (=23.84). For humidity, *M. spasma* has the widest humidity range (±12.65) and *H. galeritus* has the smallest temperature range (±0.00). *H. galeritus* roost at the most humid roosting site (=100) and *P. lucasi* roost at the driest roosting site (=89.30). The noisiest roost site is at the *P. lucasi* roosting site (78 dB). The furthest roosting site belongs to the *H. cervinus* (79.94m) and the nearest is *M. spasma* (5.50m) (table 2) (Amsyari, 2014).

3.3.2. Light intensity

There are three species that roost at both the bright and twilight zone (*P. lucasi, M. spasma* and *M. horsfieldii*); six species roosting at both the twilight and dark zone at the cave (*R. borneensis, R. affinis, H. galeritus, H. diadema, H. larvatus* and *H. coxi*) and only one species can be found in the dark zone (*H. cervinus*) (Table 2) (Amsyari, 2014).

3.3.3. Sound intensity at the roosting sites

Out of ten species, the highest sound intensity was recorded at the roosting site of *P. lucasi* (78 db). The other species roost at lower sound intensity level (Table 2) (Amsyari, 2014).

3.3.4. Echolocation

A total of 1908 echolocation calls were recorded throughout the study. The records were individually analyzed to identify the species. Besides that, a total of 44 bats from nine species were captured as it was used to collect the echolocation reference call to develop a call library. From the echolocation calls data, 11 species were identified. The most abundant echolocation call recorded was the *R. affinis*, which forms 49.84% from the total calls. The least echolocation call that was recorded is the *H. ater* (0.05%).

Table 2 Echolocation frequency, roost site zone, preferred temperature and humidity, sound intensity and light intensity.

#	Family Species	Echolocation (Khz)	Temp (°C)	Humidity (%)	Sound Intensity	Light Intensity
1	Pteropodidae					
	P. lucasi	-	24.38	62.21	78	Bright, Twilight
2	Megadermatidae	-				
	M. spasma		26.5	74.70	56	Bright, Twilight
3	Vespertelionidae					
	M. horsfieldii	65±2	23.88	78.49	65	Bright, Twilight
4	Rhinolophidae					
	R. borneensis	81±2	24.5	97.58	55	Twilight, Dark
	R. affinis	68±2	24.68	93.20	46	Twilight, Dark
5	Hipposideridae					
	H. cervinus	120±5	24.10	92.14	67	Dark
	H. galeritus	110±5	24.69	100	67	Twilight, Dark
	H. diadema	66±3	23.84	93.62	58	Twilight, Dark
	H. larvatus	90±3	24.44	93.77	57	Twilight, Dark
	H. coxi	45±2	24.23	95.30	44	Twilight, Dark

4. Discussion

The bats diversity in the WCNR faces some potential threats that could be a major problem if not taken seriously. The Wind Cave is a popular attraction among the local and foreign visitors as it provides a unique and up-close encounter with the various species of bats. Some of the tourists threatened the bat species when they try to capture or flash their flashlights with the intention to disturb the roosting bats. The bats feel threatened and unsafe, thus stressing them out. Eventually, the bats may die due to stress or even leave the cave, as they do not feel safe anymore. The bats can feel threatened and annoyed by loud noises (Schaub *et al*., 2008). Besides that, there is a recreational spot outside the cave that makes a lot of noise, especially when it has large number of visitors. The cave opening that faces Sungai Sarawak showed no presence of bats possibly because of the high light intensity or high volume of noise from the recreational spot. At night, there are also loud noises produced by a diner situated near to the WCNR main office that provides music. Foraging bats tend to avoid loud noises, thus the bats are unable to forage at the secondary forest behind the diner. The WC is considered a hotspot for bats species as it has recorded a total of 11 species roosting inside the cave. Maps that show the roosting sites of the cave dwelling bats were produced during the research. As there were too many disruptions occurring surrounding the WC, it may have decrease the population of bats. However, the number of bat species listed at the WCNR is gradually increasing year by year as new species have been found. The present study managed to record one new species of bat that was never found in WCNR which is the *Rhinolophus luctus.*

The study gathered information on bats especially on its diversity and distribution both in and out of the cave. These are useful information for the park management to disseminate to the public. The bats tourism industry has a big potential of conserving the bats population while providing social and economic benefits to the people in the host communities. Thus, bats tourism should be developed and implemented in other areas where bats, local economies and native people could benefit from such ventures.

5. Conclusion and suggestion

The WCNR has a lot to offer to the ecotourism industry. In the WCNR, bats play a vital role as it provides guano that provides nutrient to the insects as well as act as natural fertilizer, thus maintaining the ecological environment in the cave. Enlarging the protected area to include the river, secondary forest in front of the nature reserve and the primary forest across the river can help to maintain the WCNR ecosystem and may help to increase the diversity of bats. The information obtained from the study will provide tourists with the information needed so that they no longer need to wonder the bats species they can possibly see as the bats were in their roosting site. The present study conducted at WCNR provides new and up-to-date information on the diversity and distribution of bats in the WCNR. The data from the research also can be very informative and helpful thus will increase the interest of tourists toward bats. Perhaps, such places can provide updated information boards for the recreationist to cite besides increasing the success of bats tourism initiative that will benefit the local tourism market. By that, tourist also will perceive bats watching as a fitting activity for their vacation planning.

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ECOTOURISM CONSERVATION POTENTIAL OF PROBOSCIS MONKEY (*Nasalis larvatus*) AT SAMUNSAM WILDLIFE SANCTUARY, SARAWAK, MALAYSIA

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ABSTRACT

The Proboscis monkey *(Nasalis larvatus)* is estimated to be approximately 160 individuals left in Samunsam Wildlife Sanctuary (SWS) and 1000 individuals left in Sarawak. The population of proboscis monkey is decreasing since this species is fragile to habitat loss and habitat destruction that live within only 10% of the total protected areas (TPA's) gazetted in Sarawak. A river boat survey conducted in 2014-2015 showed an average of 0.305 groups/km surveyed. The abundance recorded is much higher than the two previous studies conducted in 2001 and 2004. Unfortunately, the construction of the Sarawak Pan Borneo Highway from Sematan to Kg. Telok Melano that crossed over the Samunsam River gives a big impact on the abundance and survival of proboscis monkey in the future. Thus, the study proposed that conservation efforts on proboscis monkey can be increased through ecotourism activities. Through highly potential ecotourism activities, it can help to trigger conservation awareness to the public and also bring economic benefits to the local communities.

Keywords: Samunsam Wildlife Sanctuary, Nasalis larvatus, sarawak, ecotourism and conservation.

1. Introduction

The Proboscis monkey *(Nasalis larvatus)* is endemic to the island of Borneo. It is classified by the *IUCN Red List of Threatened Species* (IUCN, 2008) as being endangered with a population trend that is decreasing. This species is prohibited in all commercial trade under Appendix I of the CITES and is listed as a 'totally protected' animal by the Sarawak Forestry Department (SFD). It is one of the monkeys from the old world from the family Cercopithecidae. that has two subfamilies, the Colobinae and Cercopithecinae (Oates & Davies, 1994). Proboscis monkey is under the subfamily Colobinae that encompasses over 30 species throughout Africa and Asia (Oates & Davies, 1994). It is also known as *rasong*, *belang pinggang*, *bekantan*, and *monyet belanda* (Dutch monkey) by the various local people.

In their social organization, the most typical group types in proboscis monkey are the one-male group that consists of an adult male, females and their offspring; and all-male (bachelor) group that consists of adult males and male juveniles. The main causes of all-male (bachelor) group type are due to inbreeding avoidance and sexual competition avoidance (Boonratana, 1999). The proboscis monkey is an arboreal (tree-dwelling) primate that is known to use three main forest types which are the mangrove forest, riverine forest, and peat swamp forest (Sha et. al., 2011). Habitat loss causes the populations of the proboscis monkey to highly decrease that it is estimated to be only 1000 individuals left in Sarawak (Bennett & Sebastian, 1988) and a bit more abundant in Sabah with 6000 individuals (Sha et. al., 2011).

According to Bismark (1994), proboscis monkey consumes exclusively 98.25% on leaves, shoots, unripe fruits, and flowers. The changes in habitat structure will affect the food resources and total number of proboscis monkey present in their habitat because this species focus on habitat quality that makes it relatively intolerant to habitat disturbances (Yeager, 1992; Bennet & Gombek 1993). In Sarawak, Samunsam Wildlife Sanctuary and Bako National Park show the highest densities in high forest and mangrove forest along the coast followed by riparian vegetation (Salter et al., 1985).

Bennet and Gombek (1993) stated that hunting and illegal logging are two major factors that cause the decrease of the population of proboscis monkey in the last 20 years in Sarawak. In Kalimantan, the population of proboscis monkey is declining due to hunting activities by non-Muslim Dayaks in inland areas; in Sabah, proboscis monkey seems flexibly distributed within areas dominantly by Muslim groups that religiously do not hunt monkeys (Sha et. al., 2011). Samunsam Wildlife Sanctuary (SWS) have experienced active logging activities since 1984 that occur in the tributaries and water catchment area of the upper part of Samunsam River in Gunung Pueh Forest Reserve boundaries

(Bennett, 1986). That area is selectively logged because it comprises of dipterocarp and riverine forest, compared to the lower part of the Samunsam River that consists of peat swamp and coastal region that has low quality of timber prices (Bennett, 1986).

In Sarawak, there are two visitors' favorite places to sight the proboscis monkey, that is the Bako National Park and Samunsam Wildlife Sanctuary. The Bako National Park (BNP) is the first Sarawak's national park and also the second oldest park in Malaysia which covers about 27 sq. km (Hazebroek & Abang Morshidi, 2006). Many groups of proboscis monkey no longer feel disturbed by visitors and can be visible along the trail resulting in high density of proboscis monkey in the two places as compared to the other places. Meanwhile, Samunsam Wildlife Sanctuary is the first wildlife sanctuary in Sarawak that was gazetted since 22nd March 1979. The only way to observe the proboscis monkey is from the boat along the Samunsam River. According to the Wildlife Protection Ordinance (WPO) 1988; Section 24 (1), no one is allowed to enter all wildlife sanctuaries in Sarawak unless they obtain a written permission from the warden in charge to conduct a research. Thus, the sanctuary is currently not accessible for ecotourism purposes while other activities are illegal.

The conservation of the proboscis monkey have been by discussed in depth by many researchers to ensure the survival of this species in the future. For example, in Kalimantan Meijaard and Nijman (2000) stated that many in-situ sites were established, but it turned out to be bad for conservation because authorities fail to manage it well and allowing threats to spread widely in the area. But in terms of ecotourism, the information available is still not enough since this species can easily move away from the present human activities in the wild. The implementation of community-based ecotourism will benefit the local people. However, with unethical and profit oriented establishments, it will cause massive expansion of tourism rather than concentrate on long-term conservation of this sensitive species (Sha *et. al.,* 2008). Thus, this study aims to propose the information and potential ecotourism conservation in Samunsam Wildlife Sanctuary (SWS). Hence, benefits through ecotourism can expand community awareness toward proboscis monkey that must be protected. Also with information on abundance and habitat use of the proboscis monkey in Samunsam Wildlife Sanctuary, it can give a better understanding on the significant potential of ecotourism conservation toward environment changes when humans approaching their habitat.

2. Study site

The Samunsam Wildlife Sanctuary (SWS) (see Figure 1) is the first wildlife sanctuary in Sarawak that was gazetted on 22nd March 1979 which is located at the western tip of Sarawak, Malaysia and on the Kalimantan, Indonesia border (1◦ 78' N, 109◦ 36' E) (Bennet & Sebastian, 1988). They estimated that there are approximately 160 individuals of proboscis monkey left. The sanctuary covers 6090 hectares and is established to protect one of the two largest populations of proboscis monkey in Sarawak (Bennett, 1986).

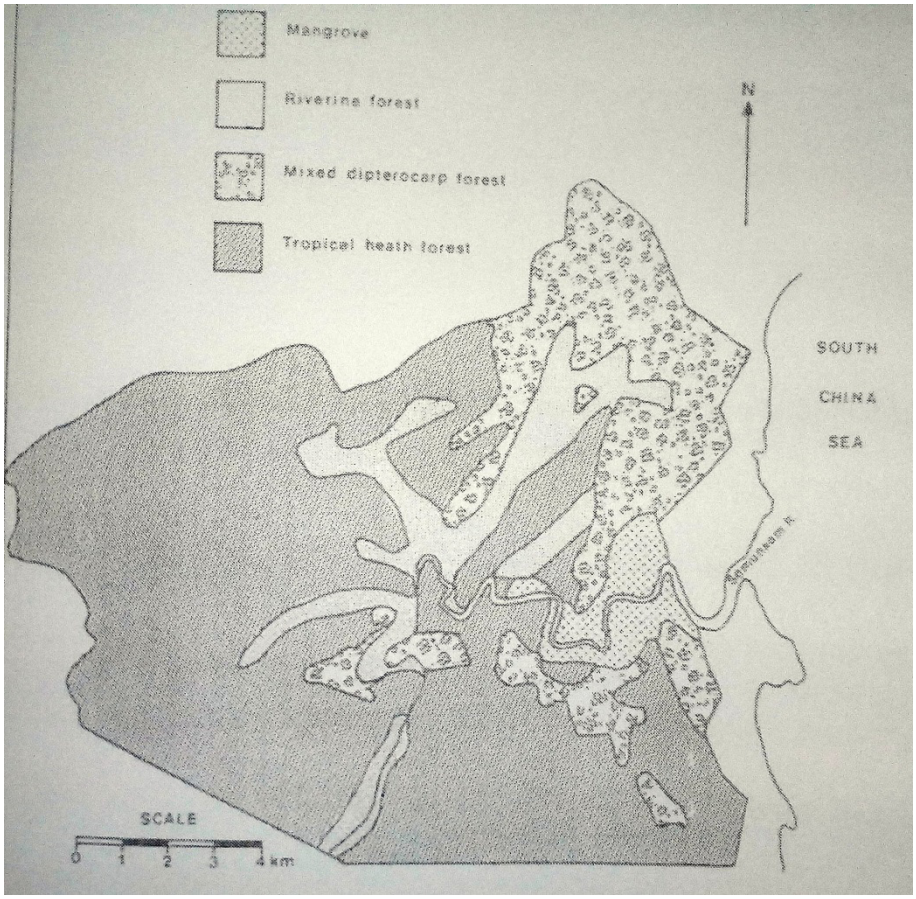

Figure 1 Distribution of different forest types at Samunsam Wildlife Sanctuary
Sources: adapted from Bennett and Sebastian, 1988

There were four types of forest vegetation along the Samunsam River. These are the mangrove forest (MF), riverine forest (RF), mixed dipterocarp forest (MDF), and kerangas forest (KF) (Bennett & Sebastian, 1988). The mangrove forest covers an area of up to 5 km at the lower reaches of Samunsam River while the riverine forest is mainly at the upper reaches of the river. The MDF conquers the Samunsam River because it consists of diverse tall, broad and buttress trees plant species (Rubis, 2001).

Figure 2 Picture showing the vegetation forest at Samunsam River. On the left side is the characterization of trees from the MG + MDF + KR and on the right side is dominated by Nipah palm (*Nypa fructicans*) which is among the species that can be found in mangrove forest (MG). Photo: Mohamad Abid

3. Methodology

Information on the *N. larvatus* was obtained through direct observation conducted throughout the fieldwork that was conducted in October 2014 and February/March 2015. At the SWS, the best way to detect the presence of proboscis monkey is by using boat transects along the Samunsam River (Bennett & Sebastian, 1986; Bennett, 1986; Rubis, 2001; Tuen & Joshua, 2007). The observation observation was conducted twice per day, at dawn (0530-0830) and dusk (1630-1930). During the sightings, the boat was slowed down and move towards the riverside when a group of proboscis monkey is spotted. The observation of the groups were conducted to collect information such as the total number of groups and individuals, sex identification, types of fruit and leaves consumed by proboscis monkey and other behavior. The use of habitat by the proboscis monkey in study sites were also recorded. In the evening survey, a tape was used to tag the sleeping sites of the proboscis monkey. This will help to recognize the same groups for the next morning survey because proboscis monkey usually do not flee from their sleeping sites after dark hour (Bernard et. al., 2011). The boat transect limits the sightings of proboscis monkey because they travel inland from early morning to late evening and return back to the riverine areas to sleep (Sha et. al., 2011).

One shot counting of the proboscis monkey was encountered as they flee into the dense forest when detected the presence of the survey boat. Moreover, the accessibility into the dense forest was highly dangerous. For example, the mangrove forest (MF) is highly affected by tidal movement and cannot be accessed during the high tide. Since the field trip was conducted in different months, the specific food consumed by *N. larvatus* is recorded based on where they were sighted. This is because according to Yeager (1989), the fruiting season starts from January to May. Hence, Yeager (1989) expects that proboscis monkey consumes fruits (frugivorous) during this season and then change into leaf-eaters (folivours) from June till December.

4. Data Analysis

For data analysis, this research calculated the abundance of proboscis monkey based on the formula given below and the individual density of proboscis monkey. The calculation was also adopted from Tuen and Joshua (2007) during their boat survey conducted in 2004. The abundance of proboscis monkey in this research was calculated as below:

1. **Individual abundance** = $\frac{\text{Total no.of individuals found}}{\text{Total km surveyed}}$

2. **Group abundance** = $\frac{\text{Total no.of groups found}}{\text{Total km surveyed}}$

*Total km surveyed = length of river transect surveyed (km) × frequency of boat surveyed

5. Results

The groups of proboscis monkey that were detected in October 2014 and February/March 2015 did not differ much. The surveys were specifically conducted before and after the Northeast monsoon from November to March. This is to ensure the heavy rainfall does not affect the travel of boat survey at Samunsam River.

Based on Table 1, the survey showed an individual abundance of proboscis monkey in October 2014 is 1.92 individuals/km while in February/March 2015, it is 1.58 individuals/km. Both of the sampling period shows that a total of 164 individuals of proboscis monkey were successfully detected. Next, in October 2014, a total 27 groups were sighted with an abundance of 0.32 groups/km. Meanwhile, in February/March 2015 there were more groups that were successfully sighted, with a total of 30 groups, but it had lower group abundance with 0.29 groups/km. There are different results on the individuals and groups calculation values because the total length distance of river surveyed (km) and the frequencies of boat surveyed were different in both fieldworks. The length of river transect surveyed in October 2014 is 10.68 km with 8 times of boat survey frequency. In February/March 2015, the length of river transect surveyed was 11.5 km with 9 times boat survey frequency. All of the measurement and calculations give rise to a total abundance of 0.305 groups/km.

Table 1 Comparison between two periods of field works in October 2014 and February/ March 2015

Survey conducted (month)	Abundance of proboscis monkey (individuals/ km)	Abundance of proboscis monkey (groups/ km)	Total groups detected	Frequency of boat survey
October 2014	1.92	0.32	27	8
February/ March 2015	1.58	0.29	30	9

In the present study, there are two species of mangrove trees that were selected by the proboscis monkey to forage during the day which are the *Rhizophora* sp. and *Avicennia* sp. A total of 55% of the groups were detected consuming leaves from the mangrove trees which are the *Rhizophora* sp. and *Avicennia* sp.; the other trees were sighted in lower percentage such as the dipterocarp trees (26%); Casuarina trees (14%); and riverine trees (11%) that consist of the *Shorea* sp. and *Oncosperma* sp. This percentage shows that the mangrove trees are the proboscis monkey's preferred food resources and cause aggregation pattern along the river. Bennett (1986) also recorded that proboscis monkey in SWS only consumed young leaves in the mangrove forest (MF) from the tree *Rhizophora* sp. The characterization of food selection behavior helps to detect the availability of proboscis monkey in Samunsam River. Apart from that, the study also sighted the other trees such as *Brugueira* sp., *Casuarinaceae* sp. and *Dipterocarpus* sp. were selected to become playing ground, resting site or sleeping habitat for the proboscis monkey. All of these trees were visible from the boat because it grows near the riverbanks.

6. Discussion

According to The International Ecotourism Society (2015), ecotourism is responsible travel to nature areas with the goal to conserve the environment, sustain the well-being of local people and involves interpretation and education. As for the Samunsam Wildlife Sanctuary (SWS), ecotourism has the potential to conserve the existing natural habitat and its iconic species that is the proboscis monkeys that live within the sanctuary.

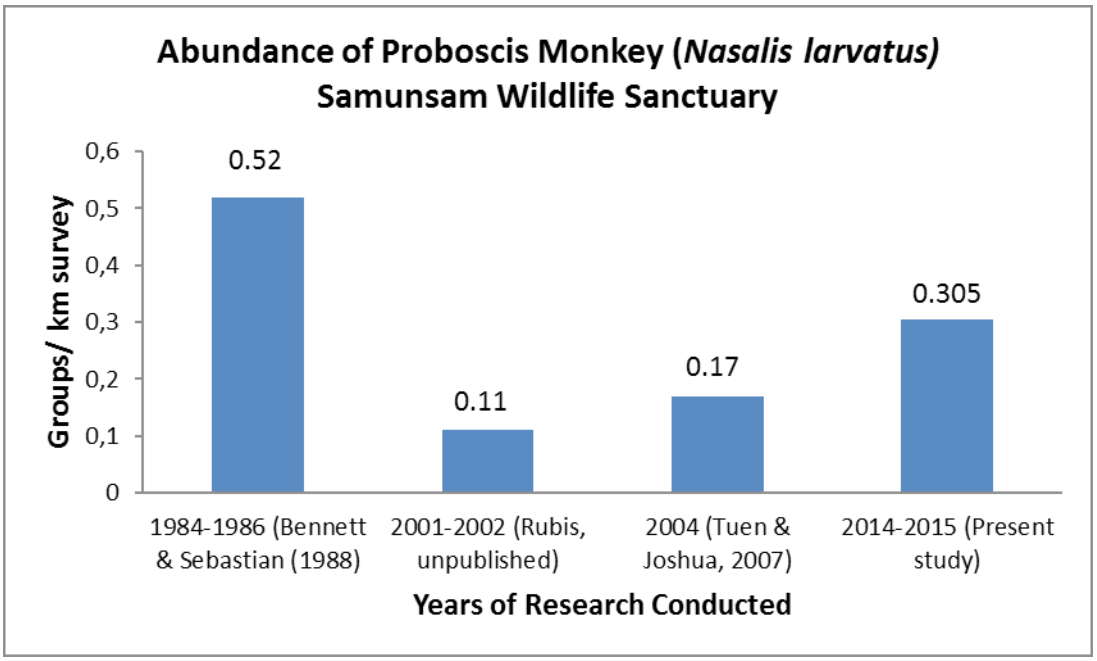

Figure 3 Comparison of the abundance of proboscis monkey (No. of group observed/ km surveyed) sighted in Samunsam River

Figure 3 shows the trend in the abundance of proboscis monkey in SWS over the past 30 years. The fluctuations in its abundance may raise many questions regarding the population size itself. What evidence that proves in such irregular data information? Survey by Bennett and Sebastian (1988) recorded the highest abundance of 0.52 groups/ km about 30 years ago. Then, the population size of the proboscis monkey recorded drop drastically to 0.11 groups/ km (Rubis, n.d.) and 0.17 groups/ km (Tuen & Joshua, 2007) in 2001-2002 and 2004 respectively. But the present study shows that the abundance has increased in the past 10 years with 0.305 groups/ km. Thus, can the current abundance of proboscis monkey support the ecotourism activities since the population size has increased?

Through our references, there is no scientific study in SWS to measure the eventual impacts of ecotourism activities. The implementation of nature based tourism has to ensure it balances between minimizing negative impacts and contributing positively towards conservation (Higginbottom & Tribe, 2004). The use of boat should be restricted in SWS as water created from boat movement can erode soil on the river bank. Hence, mangrove trees where the proboscis monkeys live will be wipe out due to soil erosion. In Kilim Geopark Langkawi, the uncontrolled use of tourist boats that pass through the river caused soil erosion on the river banks. They had to build wooden blocks to reduce the impact of soil erosion that erodes the mangrove habitat (personal communication).

The wild proboscis monkeys naturally flee from human presence in their habitat. Some of them can be defined as semi-wild such as those in Bako National Park. They no longer feel threatened by human presense and are easily visible at the park headquarters (Hazebroek & Abang Morshidi, 2006). As for the wild, the distance between tourists and the wild prosboscis monkey may affect their visibility in the habitat. During our survey, the sound of the boat engine could be heard by proboscis monkey and the sound alerted them of human presence. Thus, all of them flee quickly into the dense forest when the boat went closer. In terms of boat riding as an ecotourism activity, the number of tourist boats on river often prevent proboscis monkey from crossing the river and limits the accessibilities of food sources (Sha et. al., 2011). As a consequence, this could make them change their behavior and would probably be no longer visible in

mangrove forest. In order to minimize the impacts, the guidelines for observing proboscis monkey must be implemented (Sha et. al., 2011). For example, boats should be limited to at least 10 meters away from them and boats must use low-power outboard motor engines.

Threats to the population of the wild prosbocis monkey that happen in SWS is also the main factor that contributes to the drastic changes of population abundance. According to Bennett and Sebastian (1993), hunting and illegal logging are the major threats to proboscis monkey. Tuen and Joshua (2007) reported two shots were fired that was clearly heard during the November 2004 survey. The present sighting during both sampling periods have not seen or heard of any illegal hunters, gun shots or encroachment activities since the study uses a highly focused river route at Samunsam River. According to the warden at SWS, staffs patrolling the area often revealed that hunting activity does not happen nowadays; but hunting are most likely by outsiders because the nearest Muslim village Kg. Telok Melano religiously do not hunt proboscis monkey (personal communication). Besides, the presence of two old logging routes during observation in the upstream river at RF and MDF showed that illegal hunters can still access into SWS area. The total number of proboscis monkey present in their habitat will decline because this species is dependable on habitat quality that makes it relatively intolerant to habitat disturbances (Yeager, 1992; Bennet & Gombek 1993).

Information gathered from SWS staffs through questionnaire discovered that SWS was logged around the late and early years of 2000 (personal communication). This is the research period of Rubis (unpublished) in 2001-2002 and Tuen and Joshua (2007). Even though there are no valid data regarding logging activities happening during their research period, but survey by William (2001) in May 2000 proved that the SWS area was intruded by illegal loggers. Then, Rubis (2001) reported 17 separate encroachment activities happened in SWS during her survey at MDF and RF. Thus, it is possibly the best answer that the sanctuary can still be easily accessed by hunters, illegal loggers or encroachers. This continues to cause habitat loss to proboscis monkey in SWS. Now, with the construction of the new road of Pan Borneo Sarawak Highway from Kg. Telok Melano to the town of Sematan it will negatively impact the area as the road will cross inside Samunsam River area where many groups of proboscis monkey live.

The Pan Borneo Sarawak Highway is already under construction since September 2015. The Samunsam Wildlife Sanctuary is located between Kg. Telok Melano and the town of Sematan with the current travel time to the sanctuary by speed boat through the sea about one hour. According to the Ministry of Work Malaysia (2015), with a new line of two-way lanes (single carriageway) of 32.7 km, the residents of Kg. Telok Melano are connected to the town of Sematan. Construction of this line is expected to take 39 months and will be completed in December 2018 with an estimated cost of RM700 million. The road design in this range is environmental friendly with the objective of preserving biodiversity found in Samunsam Wildlife Sanctuary and Tanjung Datu National Park (Pan Borneo Highway Sarawak, 2016).

At this point the current study cannot see how the construction of road is said to be environmentally friendly because the work is still at the stage of leveling land in the town of Sematan. There are six new bridges that will be constructed and one of them crossing over Samunsam river. But Clements et. al. (2014) demonstratedd that many roads in Southeast Asia's forests cut through habitat of endangered mammals; revitalizing forest conversion; and makes the path easy for illegal hunting and trade of wildlife. Thus, it is suggested that a highway's viaduct to be constructed to function as a wildlife corridor to link the habitat of proboscis monkey from both sides of Samunsam River. For example, Clements et al. (2012) stated that nine species of big mammals have been crossing under 10 highway viaducts that connects their habitat at Kenyir Wildlife Corridor. The viaduct would allow proboscis monkey from limiting their food resources and movement in their habitat.

This study focuses on how to protect and conserve the population of proboscis monkey as well as becoming an ecotourism site by looking at its potential activities. Kruger (2005) mentioned that the flagship species initiated at the ecotourism site to be classified as sustainable compared a site without flagship species. In SWS, the flagship species is the proboscis monkey. High vertebrate animal such as the proboscis monkey needs many years to increase their population and the first thing must be protected is their habitat. That has become one of the pillars in the ecotourism definition, that is conservation of nature environment (The International Ecotourism Society, 2015). As mention in the result, 55% of the groups of proboscis monkeys foraging at the mangrove forest consume leaves from the mangrove trees which are the *Rhizophora* sp. and *Avicennia* sp. The findings was supported by Tuen and Joshua (2007) survey in 2004 shows that half (50%) of the groups detected were foraging at the same forest type. Mangroves forest is important for the survival of proboscis monkey in SWS and without it there would be no place for them to get cover and food.

The best model that shows ecotourism conservation site for proboscis monkey is Bako National Park. According to Hazebroek and Abang Morshidi (2006), proboscis monkey can be detected as close as at the park headquarters; and few trails that lead to the mangrove forest such as Tanjung Sapi, Teluk Paku and Teluk Delima where they live. Visitors can jungle trekking while looking for proboscis monkey. The population estimation density of proboscis monkey

increased a little from 0.16 individuals per hectare to 0.857 individuals per hectare in 2004 (Azman, 2006). Unfortunately, massive and uncontrolled ecotourism activities nowadays with an average 35,000 visitors per year (Chiam, 2011) at Bako National Park give many negative impacts such as litters, soil erosion and vegetation damage. For SWS, the way to observe proboscis monkey (by boat) in their habitat is different from the Bako National Park (walking) but the impacts could be the same if no proper management and massive tourism is applied.

Thus, since the groups abundance of proboscis monkey start to grow from present data, the awareness must be taken to ensure these animals not lost again. Through the ecotourism activities, it will promote awareness to the public and native peoples to conserve and save this species. This can be improved by law enforcement to put some signage for example to ensure no encroachment activities in wildlife sanctuary. Tisen and Meredith (2000) stated that engaging the local communities through Special Park Committee can help as the informer to detect any illegal activities happen in protected areas.

7. Conclusion

Samunsam Wildlife Sanctuary (SWS) holds a huge population of proboscis monkey in Sarawak. The abundance of the proboscis monkey in the current study shows an increasing number of groups sighted because proboscis monkey are highly favored to their habitat as sleeping site especially in the mangrove forest (MF) and food are available throughout the year. But it is impossible to implement ecotourism activities currently as the Pan Borneo Highway is actively under construction inside the Samunsam area until 2018. Hence, we must put top priority to long-term conservation efforts to sustain a population of proboscis monkey before reviewing the potential of ecotourism activities. The authorities must manage well so that threats such as hunting and illegal logging are not widespread in the future since the construction of road will make it easily accessible to outsiders. Research in the present study did not updated much in many aspects within a short time period, but profound observation needs to be documented such as the proboscis monkey population size, feeding behavior, social behavior, ranging behavior, and threats happening in the Samunsam Wildlife Sanctuary.

Acknowledgement

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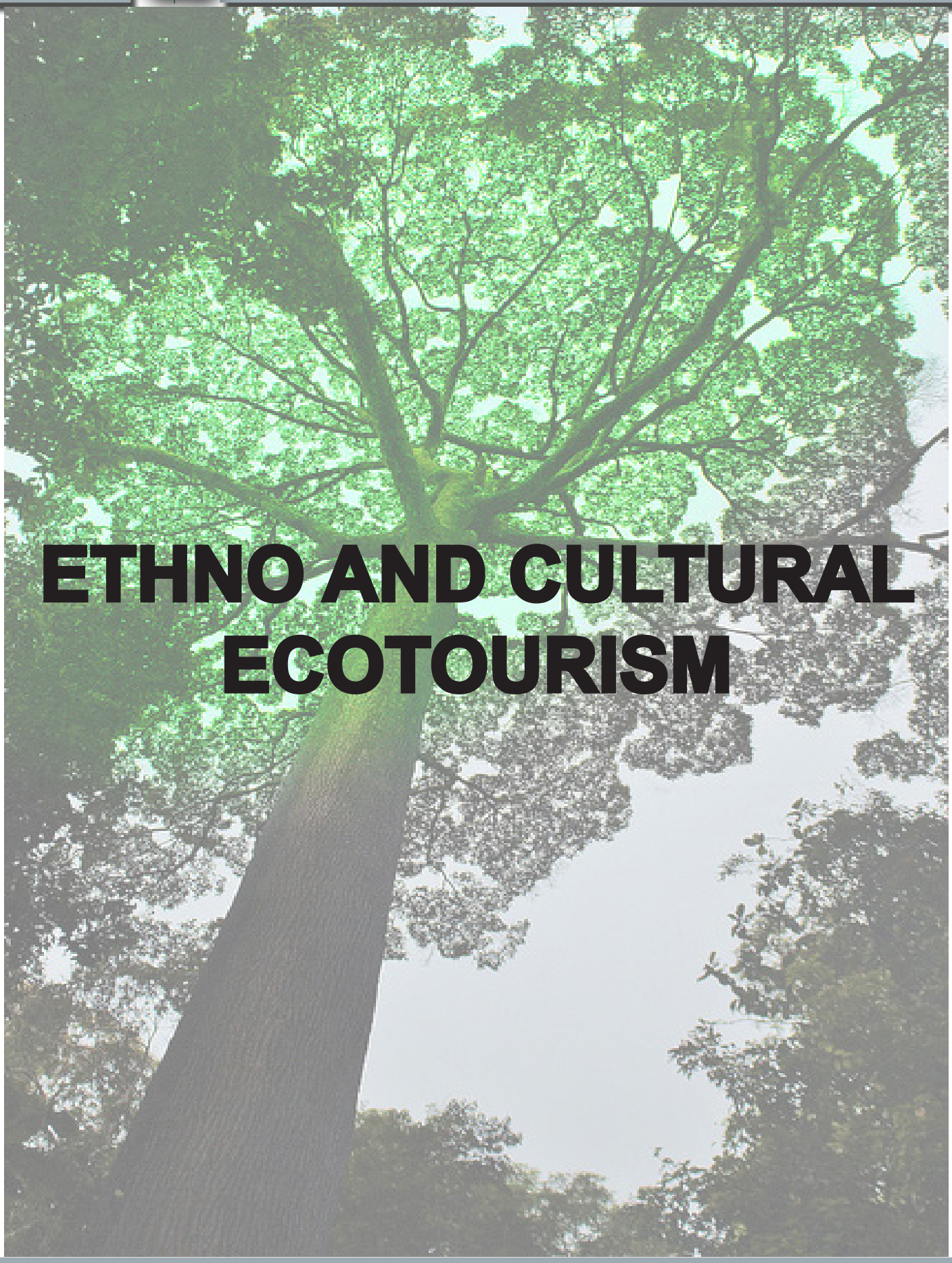

ETHNO AND CULTURAL ECOTOURISM

SOCIO-ECONOMIC IMPACT OF NATIONAL ELEPHANT CONSERVATION CENTRE ON LOCAL ENTREPRENEURS

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ABSTRACT

Ecotourism encouraged responsible travel to natural destination which accomplishes the safeguard of its benefits to natural environment and local community. Simultaneously, ecotourism benefits the local population because without the benefit, ecotourism is not practicable as it only becomes a tourism industry. A program with local entrepreneur wasconducted by National Elephant Conservation Centre (NECC) to enhance cooperation between NECC and local residents and indirectlybecomes an opportunity for NECC to brief the status of facilities and activities which are in developing process as well as facilities and activitiesthat have been planned for the future. The program also intended to obtain their views and feedback about the socio-economic impact of NECC to their business. Out of 33 local entrepreneurs who carried out their business within 14 kilometres from NECC, 31 entrepreneurs whose nature of business isas food stall operators, retail stores, rental business, farming and tourist guides attended the program. They were divided into three groups according to their business and discussed the problems faced in operating their businesses, and recommendations for improvement of cooperation between them and NECC. It was found out that local entrepreneurs agreed NECC gave advantage to their business and assist in local community's socio-economic development. Capital factor was the main problem for food stall operators, retail stores operators and homestay operators that restrained them from providing better facilities or products. As for tourist guide, the need of assistance through training and courses from NECC will further increase their knowledge and skill. The success of NECC as ecotourism destination also depends on how well the local community gets the benefits besides from how well the nature is being conserved. Thus, the output from this program will facilitate NECC in sustaining development strategy that will benefit the local community's socio-economic status and conserve the wildlife as well.

Keywords: ecotourism, socio-economic, sustainable, local community and entrepreneur.

1. Introduction

Ecotourism has gradually become more and more popular due to its benefit towards the environment and community. Besides all the known benefits that ecotourism has to offer, it is also recognised as a tool for conservation (Ceballos-Lascurain, 1998; Zhang & Lei, 2012) where it also has been proposed as a tool to secure conservation and promote development of rural communities (Neth, 2008). In Malaysia, one of the efforts to protect and conserve the natural environment is by gazetting forest reserves and the establishment of the various conservation centres. In the early years of the National Elephant Conservation Centre (NECC) establishment, it only focused on translocation of the strayed ordelinquent elephants which had encroached farms in populated area. Some elephants were also being rescued from poachers' trap that later on received treatment at this centre. Over the past few years, this centre has become a renowned destination not only for domestic but also international tourists. Besides being a hub for conservation education, the centre has also created many opportunities for the local community either to work in the centre or open their own business. In order for NECC to be a successful ecotourism destination that is fully supporting the economic aspect of the local entrepreneurs, the contribution
of NECC in this matter needs to be measured.

Ecotourism can be defined by looking at three main components which are natural-based, educational and sustainable management that includes economic, social, cultural and ethical issues (Sharifah, 2012). Therefore, NECC had taken proactive initiative to hold a program with the local entrepreneurs at this centre to enhance cooperation between the NECC and local residents. The outcome from these programs have successfully provide both NECC and the local communities not only sufficient information regarding facilities or activities that are currently in the developing

process but also the future planning for the centre. Apart from that, this study also assessed the opinion and feedback of the local community on how NECC's involvement influenced their economy and social problems. In order to fully implement the ecotourism purpose, NECC and the local community need to merge their effort to spread the conservation message. Thus, it is a necessity for NECC to assist the local community to understand the benefits and responsibilities that come with it.

2. Literature Review

Generally, tourism can improve the quality of life in an area by increasing the number of attractions, recreational opportunities, and services. The difference between tourism and ecotourism is ecotourism emphasizes on conservation and education while tourism does not do so; but both give benefits to the local community. As for ecotourism, local community's involvement is a must to entitle a place as an ecotourism destination. The International Ecotourism Society defines ecotourism as travel to the natural area that protects the environment and sustains the well-being of the local people (Kiss, 2004). By involving the local community in the development process, NECC will somehow increase support for the protected area.

Pimbert and Pretty (1997) suggested in the study that to achieve sustainable conservation, the state authority and environment planners should involve local people in the management of protected areas and "need to identify and promote social processes that enable local communities to conserve and enhance biodiversity as a part of their livelihood system" (Pimbert & Pretty, 1997). The involvement of local community with the conservation activities is significant to the improvement of the standard living conditions in the community (Sebastian & Rajagopanlan, 2009; Mensah, 2012).The establishment of protected areas alone does not guarantee the successfulness of the conservation of the natural and cultural diversity as support from the local community is strongly influenced by their perceptions and opinions toward the management and governance (Bennet & Dearden, 2014). Managing protected areas may give rise to social and economic conflicts (Clapp, 2004; Lawrence & Raitio, 2006; Plummer & Fennel, 2009). Even though local community were encouraged to play an important role to maximize the social-economic benefits, conflicts usually arise among them in decision making on the utilization and management of the natural resources (Govender et al., 2005).

The support of the local community in ecotourism development especially for conservation center in a developing nation has been very limited and eventually it can jeopardize the operation. Murphy (1985) mentioned that if local participation is ignored along the tourism development process, it can increase the cost of business or destroy the industry's potential. Therefore, support from the local community that reside at the vicinity of the center is important to be taken into consideration as it determines the successfulness of nature-based tourism in the area (Liu et al., 2012). Thus, the involvement of local community in the ecotourism development process is essential for tourism planning and management to enable local community's aspirations, capacities, resistance and hostility can be adapted (Tomićević, Shannon & Milovanović, 2010).

The NECC can be considered as an effective conservation and wildlife management tools that can also have a broad array of positive and negative impacts towards social, economic, cultural and political factors in local communities. In addition, an evaluation of ecotourism's contribution to economic benefits in host regions requires an analysis of the backward and forward linkages between tourism and other sectors, an understanding of the spatial area of tourism activities and identification of the beneficiaries of its economic and other effects. Diedrich and Garcia-Buades (2009) argue that understanding and assessing tourism impacts in communities is important to maintain sustainability and long-term success of the tourism industry.

As tourism industry based on interactions with wildlife has been growing in popularity across the world, destinations which offer wildlife interaction activity has received many tourists and most of the destinations are ecotourism sites. Nowadays, NECC is known as a popular ecotourism destination in Pahang and generally in Malaysia. Hence, it is essential for NECC to assess the impact of the establishment of NECC on the socio-economic of the local community. Ecotourism is seen to contribute to the economy of the local people by expanding their income through alternative employment opportunities and entrepreneurship (Che, 2006). By assessing local entrepreneurs' feedback on NECC, it will show how successful ecotourism has been through the NECC. Socio-economic is defined as an individual's resources, wealth, education level and degree of urbanization. Other than that, socio-economic aspects can also be assessed through the employment, infrastructure, facilities and living condition (Mbaiwa, 2003). Thus, the conservation centre may be a potential source of earning for the local people in Pahang. The present study examines the socio-economic impacts, especially the economic impact of the NECC on the local economy, the impact of NECC development in the district, and how the centre affects the community.

3. Methodology

A program with local community in Kuala Gandah and nearby villages was conducted on 10 February 2015 with participation from local entrepreneurs which included food stall and retail shop owners, homestay operators, farmers and nature guides. All the local entrepreneurs invited were based on their village distance from the NECC. The distance was within the 14 kilometres distance from NECC which included three villages (Bolok Hilir, Bolok Hulu and Sokmek). All participants first answered the structured interview with a set of questions on their family and business background. Then, there was a presentation from the National Elephant Conservation Centre on the centre's on going and future development. They were then separated into three groups which were food stalls and retail store operators, homestay operators and nature guides. In each group, they were asked to discuss on the problems they faced in their business and suggestions on how it can be overcome. Finally, each group sent their representative to present what they had discussed earlier and it was followed by a question and answer session. The program ended with a conclusion by the NECC.

4. Results

4.1. From the structured interview, the participants were divided into three groups with their profile as below:

4.1.1. Retail and food stall operators

Majority of the retail and food stall operators in this groups were from Bolok Hulu village where it has more number of villagers. They were age 55 and above; married and had stayed in the village for more than 30 years. They also received education till secondary school level. The average monthly income for this group is between 500 to 1000 (Ringgit Malaysia). Majority of them make their living in this business. Their customers were mostly the local community followed by international tourists, government staffs, domestic tourists and contract workers.

4.1.2. Homestay operators

Out of the 8 homestay operators that were invited to this program, only 5 participated. This group belonged to local entrepreneur with ages 55 and above; they are Malay from the Bolok Hilir village and married. Three of them obtained higher institution education while the rest only studied till SPM level. Homestay business is the main source of income for three of them while the rest has other sources of income, such as farming. Majority of them earn a monthly income between 500-1000 (Ringgit Malaysia) while the rest made 2001-3000 (Ringgit Malaysia). Customers for this group were mainly come from Malay citizen who had wedding ceremony in the village followed by domestic tourist.

4.1.3. Nature guides

Out of the 12 nature guides listed as Kuala Gandah nature guides, only 9 participated. Majority were male, age below 30 years and they stay in Bolok Hulu village. Most of them studied until secondary school and only few had higher institution education. Their monthly income between 500-1000 (Ringgit Malaysia) where being a nature guide is the main source of income for most of them. The customers for this group are majority international tourists.

4.2. The output from the discussion for each group are as below:

4.2.1. All the food stall and retail shop operators were interested to cooperate with NECC and most of them agreed that the establishment of the centre has helped in their businesses and the development of the local community's social-economic. However, the main problem they faced is the lack of capital to make their shop appearance looks attractive and to also enhance their product variety and volume.

4.2.2. For the Homestay operators, they are also interested to cooperate with the NECC. All agreed that the establishment of the centre helped their business and local community's socio-economic development. However, they stated that their main problem was the lack of promotion of their homestays. Some of them also stated that the public infrastructures should be improved to attract more people to visit.

4.2.3. The nature guides are the groups that deals with tourists every day. They are fully interested to cooperate with NECC. They also totally agree that the establishment of the centre has helped in their career and the local community's socio-economic development. Lack of training and course on tourist guiding is their main problem besides the weather condition that limits activities during raining season.

5. Discussion

In managing ecotourism destination, local community cannot be disregarded. As mention earlier, ecotourism acts as a conservation tool for the natural environment and at the same time provide economic benefits to the local community. The strong support from the local community will give a reason to some politicians and legislators to protect the natural areas such as for watershed and for future generations (Weaver, 2001). A study in Seychelles on community involvement in the development of whale shark ecotourism and its socio-economic impact also showed that by engaging local community in ecotourism research, it not only benefit them in terms of conservation but also provides important source of income to the local community (Rowat & Engelhardt, 2007). It is important for NECC management to emphasize on local community socio-economic benefits to make NECC successful as an ecotourism destination. For example, at the North East Kent European Marine Site (NEKEMS), the government overcame conservation obstacles for many years by engaging local community and concern on their socio-economic benefits (Roberts & Jones, 2013). The outputs gain from this program showed that local community had gained good benefits since the establishment of the centre. The NECC has brought changes to the local community social and economy where it had created many jobs opportunities for them. However, to what extend the benefits spread, that will be the output from this program. Most local entrepreneurs were among the food stall and retail shop operators as this kind of businesses seem to be the easiest business to set-up. However due to capital factor, they only managed to open small scale and are unable to expand their business or make it more appealing.

As for the homestay operators, they do not have enough information on what the homestay concept really is and this leads to ineffective promotion. As homestay operators, they need to offer activities too and do not focus on selling rooms only. The lodgers need to experience the host activities either as rubber tapper, farmer and retailer or as a nature guide in NECC. In promoting homestay to tourists especially international tourists, the content of the package will be the pull factors beside the medium use to promote it. For the nature guides, they pointed out that the lack of training and course will be the main problem for them. This is true as it is important for them to have knowledge and skills on how to be a good nature guide. To be a good nature guide, they should have good communication skill and knowledgeable on their environment as a good nature guide is a key to a great experience. Nature guide also work as a moderator for the centre and they act as the centre's representative, thus their skill to communicate and guide tourists is important.

In general, the NECC has improved their facilities for visitors and elephants. For elephants, 10 hectares of forest for roaming area has been prepared together with the observation desk in the forest for tourists to view. For elephant recovery and health, exercise yard and elephant hospital together with quarantine section were created. While for the visitors, a grandstand was made for better viewing during the elephants' show. Besides that, the visitors' square, cafeteria, information kiosks (registration kiosk and nature guide kiosk), toilets for disabled visitors, improved new signage system which will direct visitors in the area and a platform to view the bathing activity. Most of these facilities have been completed and some are already in use, while only some facilities are still under construction. Through this program, NECC could explain this improvement and how these developments could attract more tourists which will also directly impact on their business.

According to the result of this program, among the early steps to be taken by the NECC are improving the activity packages by broadening its cooperation with the local entrepreneurs which include nature guides, food stall and retail operators, farmers and homestay operators. Previous package only included activities that are based on the elephants' routines like feeding, bathing and cleaning. As for group activities, it depends on special requests and it is not being promoted. Therefore, in the improvement plan by NECC, they have created new packages such as the volunteering work and educational packages. In these packages, the activities are not limited within the centre but

includes activities outside the centre such as visiting the aborigines' village, jungle trekking and environment education activities. With new facilities in progress in NECC like the elephant observation deck, education centre, Gandah and Krau Wildlife Reserve galleries, it can create new activities that are also included in the package. By including activities other than the elephants' routine activity will optimize visitors' time and experiences at NECC and indirectly increase local entrepreneurs' income. NECC has also discussed with tourism to collaborate with homestay operators. In fact, one homestay committee has even been set up for homestay promotion and development.

6. Conclusion

It cannot be denied that local community gained economic benefits from the establishment of NECC. However, the income they gain is lower than the average income for the rural population in Malaysia (Economic Planning Unit, 2015). Thus, for nature guides, NECC will increase nature guide service charges according to the standard nature guide guideline as NECC improvement plan hopes to increase local community income. However, NECC cannot solve the problem regarding public infrastructure and this matter has been extended to the village committee and the distinguished authorities. This program is expected to strengthen the cooperation between the locals and the NECC as the program functions as a medium for discussions to solve problems together. With a better understanding and good cooperation between NECC and the local community, coupled with new facilities development at NECC, it will make NECC a great ecotourism destination in Malaysia that will contribute to the sustainability of the environment management and the local community socio-economic.

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A PROPOSED STUDY ON FOOD TOURISM: EXAMINING FACTORS AFFECTING TOURISTS' SATISFACTION AND BEHAVIOURAL INTENTIONS TOWARDS NYONYA RESTAURANTS IN MALACCA

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ABSTRACT

The rise of the tourism sector has provided a platform for Nyonya restaurants to flaunt their best features and to attract tourists who want to indulge themselves in the culture of Malaysia. This study focuses on the factors that influence tourist satisfaction and behavioural intentions. The variable of this study is restaurant attributes which encompasses food, service and environment qualities as well as perceived price fairness. Convenient sampling method will be carried out in three Nyonya restaurants in Malacca and a total of 300 respondents will be chosen through self-administrated questionnaire. Data collected will be analysed using Statistical Package for Social Science (SPSS) version 22. Data analysis will apply factor analysis and multiple regressions to determine the dimensions of the attributes that affect tourist satisfaction and behavioural intentions. This present study is important because it helps restaurateurs to identify the wants and needs of customers when dining out. From a managerial perspective, the study hopes to provide information on the attribute that have the greatest effect on tourist satisfaction and behavioural intentions. With that piece of information, restaurateurs can develop strategies and execute plan to help them serve the tourists better and thus improve the profitability of their businesses with better efficiency.

Keywords: Tourist satisfaction, behavioural intentions, restaurant attributes and Nyonya restaurants.

1. Introduction

Tourism is one sector that plays a significant role towards the economy growth of a country (Omar & Ab. Karim, 2014). According to World Tourism Organization, tourism is an activity where people move and spend their time in places outside their normal surroundings for less than a year for leisure, business and other purposes. Malaysia has been receiving substantial intake of tourists from all over the world every year. Around 27 million tourists visited Malaysia in 2014. The direct contribution of the industry to Gross Domestic Product (GDP) was RM 61.0 billion that year which increased from RM 58.3 billion in 2013. The revenue was created though industries supported by tourists, namely hotels and restaurants, airlines and other transportation services (excluding commuter services) and other leisure industries (WTTC, 2015).

The heightening dominance of tourism breathe a new life into local exotic culture such as the Peranakan culture which has become much diluted after World War II. The translation of the Peranakans culture into objects for tourist consumption revives the culture (Ooi & Lai, 2014) which has also become somewhat of a brand name (Dollah & Che Kob, 2003). The label fits nicely into the country's official destination slogan "Malaysia – Truly Asia" which depicts Malaysia as home to a rich blend of numerous Asian cultures (Ooi & Lai, 2014). The Nyonyas have played a more outstanding role than the Babas in rebuilding the Peranakan heritage for it is the legacy of the womenfolk that have the faculty to attract tourists, namely the cuisine, accessories and clothes (*kebaya* & *kasut manek*) (Dollah & Che Kob, 2003).

Initially, the Nyonya delicacies are sold in *kopitiams* (coffee shops), wet markets, hawker centres, 'economy rice' stalls, '*chu char*' places (Ong, n.d.), and *pasar malams* (night markets). These establishments creatively fuse Nyonya foods into the repertoire of Malaysian cuisine, selling it alongside Malay, Chinese and Indian cuisine. Family-run Nyonya restaurants are fast emerging into the scene, perhaps by the urge to perpetuate the Peranakans heritage and identity through its cuisine (Wong, 2007). The colourful Nyonya *kueh, laksa, otak-otak* and *kerabu* are also a highly sought-after commodity in major hotels (Tan, 1988; Sidek, 2005) and high-end shopping malls. Remarkable numbers of new restaurants are escalating in enclaves such as Melaka Raya and Tengkera in Malacca and Georgetown, Penang as well as in Kuala Lumpur and Selangor.

The elevation of the status of food allows restaurant businesses to bloom at a rapid pace. Food has turn from human sustenance to an integral instrument in exhibiting the identity and culture of a destination (Nam & Lee, 2011). Many researchers have agreed that this sub-element of tourism seems to possess a profound effect on novelty-seeking

tourists when they are choosing for a holiday destination (Moginon, 2010; Omar & Ab. Karim, 2014). They recommended that every country should concentrate on making their regional food a central attraction to tourists for they are symbolic items which capture the essence of the place (Nam & Lee, 2011). Tourists of today seem to embark on an endless quest to search for extraordinary experience (Omar, Ab. Karim, Abu Bakar & Omar, 2015). Boyne, Hall and William (2003) discovered that tourists spend nearly half of their budget on food during their travels (Yusni, 2010) and the whole sum is amounted to 30% of tourism revenues (Omar et al., 2015).

Ethnic restaurants can function as a principle interaction tourists have with the culture of a destination (Nam & Lee, 2011). Restaurants do not only produce food for immediate consumption but also 'foodservice experiences' (Yuksel & Yuksel, 2002). As 'cultural ambassadors', they expose tourists to food and people of the host country as well as their way of life. Tourists will also get to grasp the differences between their culture and those they come to interact with (Nam & Lee, 2011). When one dines, all senses of human: vision, touch, hearing, taste, and smell are stimulated and hence, this activity has gradually become a principal channel for tourists to appreciate the local culture of a destination (Kivela & Crotts, 2006). Thus, these restaurants are indispensable to foreign tourists who consider dining out as a mandatory component of their travel itinerary.

Due to the astonishing growth of ethnic restaurants in the recent years, there have been hostile competition amongst them. Restaurateurs are striving to attain the highest returns possible to remain profitable and to keep the business running. As the ethnic food market expands, the choices of the customers on where to dine are based on impressions concerning restaurant attributes. The perception of customers on restaurant attributes is considered to be an important factor that can influence their fulfilment and behavioural intentions in the food service industry (Namkung & Jang, 2007; Liu & Jang, 2009). The rudimentary restaurant attributes which have always been under scrutiny are food, service and environment with the addition of price fairness. Determining customer satisfaction is pivotal measure if restaurateurs are to determine how the attributes affects this aspect. As customer's satisfaction will permit restaurants to foster long-term retention and competitiveness (Yuksel & Yuksel, 2002), restaurant operators need to formulate a customer-oriented marketing strategy that recognizes customer needs which will result in satisfied and loyal customers (Lim, 2010).

Even though several studies have been done to assess tourist satisfaction in different domains of travel and tourism, relatively inadequate empirical research is carried out to explore tourist satisfaction with restaurant dining experiences. Few past studies that addressed the important attributes of ethnic food and service quality, and their influence on tourist satisfaction and behavioural intention were done for ethnic restaurants outside Malaysia (Yuksel & Yuksel, 2002; Nam & Lee, 2011). From an academic perspective, despite the popularity of ethnic restaurants in the Malaysian foodservice industry, this area has received little research attention. Recently, there are a few studies done in Malaysia on Chinese Muslim restaurants (Shariff, 2012), Mamak restaurants (Ramly et al., 2004) and Middle-Eastern Restaurants (Zainuddin, 2012). Nevertheless, the target subjects were citizens of the country and the researchers placed more focus on the factors that influence restaurant selection rather than satisfaction. Little effort has focused on determining antecedents of customer satisfaction and post-dining behavioural intention in the Nyonya restaurant industry. Hence, there is a serious need to determine the aspects that will create satisfied tourists and to nurture positive behavioural intentions for the Nyonya restaurant industry if the organizations are to serve the foreign tourists better. The study can be a first step toward cultivating the success of Nyonya restaurants.

2. Literature Review

2.1. Customer Satisfaction

Customer satisfaction has an enviable status in marketing literature for over three decades for contented customers will advantage organizations for a long time through loyalty and continuous profitability (Dube, Regnahan & Miller, 1994; Liu & Jang, 2009). This term is defined by Oliver (1997) as reaction of the customers out of contentment. It is an evaluation that a feature of a product/service, or the product/service itself is imparting a pleasing level of consumption-related fulfilment. In short, it means the general contentment level with the experience provided by a product or service (Andaleeb & Conway, 2006). Past researches have demonstrated that measuring customer satisfaction is a complex procedure whereby a great number of factors are involved. Many theories on satisfaction are based on a relative theory, in which satisfaction is always evaluated though comparison with a standard. Some of their names are Lewin's expectancy-disconfirmation theory (Oliver, 1981), equity theory (Oliver & Swan, 1989), three-factor theory.

Many past studies on customer satisfaction cited in the foodservice literature have concentrated on ascertaining the

sources of customer satisfaction (e.g. attributes) to discover effective ways to determine customers' wants and needs. However, considerable disparity appears in the level of specificity of the attributes studied. Oh and Jeong (1996) constructed a 19-items fast-food restaurant satisfaction instrument while Qu (1997) formulated a 14-items instrument to measure the determinant factors and customers' choice intentions for Chinese restaurants in the United States. Although studies have shown divergent levels of attribute specification, there is a consensus among most researchers in which customer satisfaction is affected by multifaceted character of factors that reflect the multifunctional nature of hospitality services (Kivela, Inbakaran & Reece, 1999). Literatures have confirmed that satisfaction is resulted from a confluence of attributes, specifically food, service, environment and value of the meal (Dube et al., 1994; Ladhari, et al., 2008; Nam & Lee, 2011).

2.2. Behavioural Intentions

Past studies have widely ascertained that customer satisfaction is positively related to behavioural intentions (Liu & Jang, 2009; Ryu & Han, 2010; Canny, 2014). Customer satisfaction is considered as one of the fundamental precursors of post-purchase behavioural intentions because it substantially improves the insight of customers towards the product or service. It can also heighten the conscious effort of customers to come back again in the future (Oliver, 1980). Customers are more likely to revisit again if the restaurants give them a positive impression (Sukalakamala & Boyce, 2007). Considerable numbers of studies have shown that improving customer satisfaction level is essential to increase revisit and recommendation intentions besides being a predictor of customer loyalty (Han & Ryu, 2006; Nam & Lee, 2011).

According to Susskind (2002), customers will take several actions when they are unhappy about their dining experience. They may try to overlook the poor quality of the service and continue to patronize the establishment or they might try expressing their concerns to the operator in the hope of setting things right on the spot. The last alternative they may take will be detrimental to the organization and that is they will quietly depart and will never return again (Susskind, 2002). Sulek and Hensley (2004) highlighted the fact that more than 90 percent of unhappy patrons will never return and will switch to another place (Oliver, 1997). Regardless of their later actions, customers are likely to complain to an average of ten people about their unfavourable dining experiences that they encountered. For that reason, it is safe to say that satisfaction impacts severely on behavioural intentions (Sulek & Hensley, 2004).

Despite the close linkage between customer satisfaction and behavioural intention, previous studies have demonstrated that factors influencing customer satisfaction do not always agree with those affecting behavioural intentions. For instance, though Sulek and Hensley (2004) who carried a study in a full-service restaurant found that food, atmosphere plus fairness of the seating order are all important predictors of overall dining satisfaction, only food was found to be an antecedent of post-dining behavioural intentions. Another example can be detected in a study done by Namkung and Jang (2007) in which they only pay attention to one dimension: food quality. Even though food taste and presentation are found to affect satisfaction and behavioural intention significantly, temperature has a substantial effect only on customer satisfaction. Hence, there is an urgent need to inspect restaurant attributes and their impact on both customer satisfaction and behavioural intention.

2.3. Factors Affecting Customer Satisfaction & Behavioural Intentions

In recent decades, customer has become more sophisticated and they are no longer willing to spend their money on inferior service or food quality. Consumer of today is searching for an exceptional, unique, and avant-garde dining experience. To tackle such challenging matters, the restaurant operators will need to comprehend the importance of understanding customers' perceptions on the attributes of Nyonya restaurants if they are to achieve success (Sukalakamala & Boyce, 2007). Identifying predictors of customer satisfaction and behavioural intentions has always remained a pivotal concern of foodservice practitioners. It is widely understood that most organization have limited resources and therefore, restaurateurs can only make the right decision and invest the resources in a way which can increase the number of satisfied customers if the right attribute or dimension is established (Matzler & Sauerwein, 2002). Restaurant attributes covers three fundamental aspects: food, service and atmospheric quality (Kivela et al., 1999, 2000; Sulek & Hensley, 2004; Liu & Jang, 2009; Ryu & Han, 2010; Canny, 2014). Perceived value is also gaining place as another essential restaurant attribute (Liu & Jang, 2009). Through a literature review of dining satisfaction and behavioural intention, all four basic elements of restaurant attributes were found to relate to customers' overall dining satisfaction and their post-dining behavioural intentions.

2.3.1. Food Qualities

Food is the main item which is made and sold in restaurants. Food quality has been widely acknowledged as a key antecedent of customer satisfaction and behavioural intention (Dube et al., 1994; Sulek & Hensley, 2004). Regardless of the significance of food quality in restaurant industry, no agreement is reached on the individual attributes that embody the fundamentals of food quality. Sulek and Hensley (2004) placed all food attributes into only one variable named food quality, whereas Kivela et al. (1999) argued the existence of many attributes under food quality, namely presentation, tastiness, freshness, nutritious, menu item variety and temperature. A thorough review of foodservice literatures reveal the general description of food quality which primarily focuses on food appeal, food safety and healthy options.

In a study by Liu and Jang (2009), food safety was detected to be a substantial predictor to customer satisfaction but meeting this requirement did not seem to have impact on customers' intent to return patronage. Another notable cue for evaluating food quality is food appeal which encompasses attributes like taste, presentation, freshness, textures, colour, temperature, size of the portions, and entrée complexity as well as menu variety (Kivela et al., 1999; Sulek & Hensley, 2004; Namkung & Jang, 2007; Canny, 2014). Findings of Namkung and Jang (2007) discovered taste and presentation influenced satisfaction and behavioural intention while temperature of food only had impact on satisfaction. Healthy food is also gaining acceptance (Siguaw & Enz, 1999). In the last few years, there is a surge of numbers in people who are seeking for healthy options (Sulek & Hensley, 2004) and this phenomenon suggests that customers may choose their dining place based on the availability of such selections (Namkung & Jang, 2007). Despite the fact that Namkung and Jang (2007) found that healthy options to be an insignificant predictor of satisfaction, it had a major impact on behavioural intentions. Lastly, customers of ethnic restaurants typically wish to experience authentic ethnic culture and therefore, the importance of food authenticity is not to be ignored (Tsai & Lu, 2012).

2.3.2. Service Quality

A majority of researches on service quality of various industries has been based on SERVQUAL (Parasuraman, et al., 1988) and its alternative SERPERF (Cronin & Taylor, 1992). Primarily, Parasuraman et al. (1985) formulated ten dimensions of service quality but they later condensed the number to five for they found them to overlap and the SERQUAL model was invented. They argued that service quality (SQ) can be ascertained by comparing the expectations and perception of the customers on the performance of a service (Liu & Jang, 2009). The formula is SQ = P-E, whereby P is how the customer perceive the performance of a service while E is his or her expectation. Service quality is considered high if P is more than E and vice versa. Regardless of the fact that this model is widely utilised, it is criticized for being inadequate for generalisation and its failure to explain for some industries (Yildiz, 2011).

In order to suit the SERVQUAL model for the usage of restaurant industry, Stevens et al. (1995) altered a few items from the original SERVQUAL and established DINESERV. This model which is used to determine perceived service quality in restaurants fits into SERQUAL's five dimensions. SERVQUAL and DINESERV models remain the most commonly used diagnostic method for evaluating service quality despite receiving censures from other researchers. The five dimensions that customers use to evaluate service quality are tangibles, reliability, responsiveness, assurance and empathy (Parasuraman et al., 1988). The tangibles dimension deals with elements that customers can detect through sense of sight: restaurant's appearance, cleanliness, comfortable seating area, appearance of personal, and attractive and legible menu. Although cleanliness of space cannot stimulate satisfaction, its absence will trigger dissatisfaction (Bharath, et al., 2007). Chung and Hoffman (1998) found that customers are extremely adverse to issues such as bad smells, filthy serving equipment, foreign object in food and signs of pests and these problems will create a lasting, damaging impression on the restaurants and gave rise to low repatronage intention.

The second dimension, reliability captures the meaning of being capable of providing service consistently and accurately. DINESERV items that sits under this dimension includes accurately served food, consistent service and rapid amending of mistakes. The staffs' attentiveness and prompt action in serving customers are the focus of responsiveness. Prompt service is an aspect which must not to be taken lightly if the restaurateurs plan to keep the customers satisfied. According to Yuksel and Yuksel (2002), level of satisfaction drops as waiting time increases as long waiting time will jeopardize the customers' experiences. Mental stress due to the ambiguous length of time they must wait and the productive time that is lost justify the fact that the waiting time should be reasonable. Customers must also be given sufficient time to finish their meal for nobody would like to savour their food in a rush (Yuksel & Yuksel, 2002). On the other hand, the servers' detailed knowledge of the menu items as well as their ability of portraying professional mannerism such as competence and skills in presenting polite, friendly and helpful attitude (Canny, 2014) is the main elements of assurance. The employees' sensitivity in sincerely caring for customers' needs and wants plus handling of complaints is assessed by empathy (Ladhari et al., 2008).

According to Yuksel and Yuksel (2002), communications with the service provider of the restaurants produce a considerable weight on the assessment of the customers on the organisation. They argued that food and the manner it is presented to the customers are equally important. However, they also found that the service performance might have a more prominent role than food quality in enhancing satisfaction as long as the latter is acceptable. Service quality will be the ultimate judgment of customer satisfaction when the food is of splendid taste and the décor and furniture are suitable. Hence, an excellent marketing plan means nothing should there be a failure in interaction.

2.3.3. Physical Environment

Good food and service only are not sufficient to form a decent dining experience. Restaurant environment is another aspect that possesses the ability to create a meaningful experience to customers (Ryu & Han, 2010; Ariffin, et al., 2012; Canny, 2014). Kotler (1973) coined the term *atmospherics* to explain the effort to fashion buying spaces to create certain emotional effects in the purchaser that boost his or her buying probability. He explained that the quality of the surrounding environments is accessed by the sense whereby the key sensory channels are sight, sound, scent and touch. Although it is widely accepted that food and service qualities as well as prices are the critical factors that determine the fate of the restaurant, atmosphere is gaining popularity as customers are seeking a novel dining experience totally dissimilar from home (Kotler, 1973). Hence, Ariffin et al. (2011) deduced that the importance of this aspect could be on par with the products in terms of customers' buying decision.

Environment can influence the actions of the customers, especially on their outlook of the place and their social interactions. The probability of customers to pass their time and spend their money in agreeable environments is definitely higher than disagreeable ones. The settings of the restaurants are found to have profound impact on the length of social interaction (Yuksel & Yuksel, 2002). Ryu and Han (2010) commented that food and service quality are immaterial as they cannot be judged until they have been consumed or experienced. Thus, customers can only look to tangible cues such as lighting, arrangement of furniture, exterior design and others to predict the sort of products and services that the restaurant will deliver. Besides having the ability to attract and ward off potential clients at first glance, the surroundings can also influence the cognitive, emotional and physiological reactions of customers which can later be translated into their actions (Yuksel & Yuksel, 2002). Clark and Wood (1999) claimed that restaurateurs should give more attention to tangible features rather than intangible ones if they are to attain customer loyalty and constant restaurant patronage.

2.3.4. Perceived Price Fairness

Apart from the food, quality of service and conditions of the environment, the price is another factor that drives a customer to the restaurant (Andaleeb & Conway, 2006; Liu & Jang, 2009; Nam & Lee, 2011; Ryu & Han, 2010). Perceived price fairness is defined as the evaluation of price by customers who will decide if it is reasonable, acceptable and just (Bolton, et al., 2003). It is based on their internal reference prices, which can be the last price paid, the price most frequently paid and market prices in similar transactions (Kahneman, et al., 1986). It could also be an average price of a service as assessed by a customer through comparison with those of its competitors.

Price perceived to be reasonable will lead to customer satisfaction and loyalty (Han & Ryu, 2009). On the other hand, an exorbitant price will evoke dissatisfaction and disappointment, leading customers to retaliate by spreading negative comments and switching to other restaurants, even to a less-than-optimal choice (Peng & Wang, 2006; Xia, Monroe & Cox, 2004). Likewise, Andaleeb and Conway (2006) mentioned that customers will expect high quality product/service and nothing less when the price is high. Otherwise, it can induce a sense of being deceived. Customers are inclined to question the restaurant's capability of delivering quality products and services if the price is low. Hence, restaurant managers should always propose a reasonable and affordable price to ensure the contentment of customers.

3. Methodology

3.1. Research Design

This research will employ a descriptive research design. Questionnaire will be the prime source in this data collection. A structured questionnaire is developed based on a thorough review of the literature and will be pre-tested by 30 tourists at a Nyonya restaurant to ensure the reliability of the instrument developed. The questionnaire will be updated and improved based on the feedback from the pilot test. Before finalising the questionnaire, a few food experts will review the questionnaire, and alterations will be made based on their suggestion to ensure content validity. The finalised questionnaires will be distributed to 300 tourists (100 per restaurant) in 3 well-known Nyonya restaurants in Malacca.

A convenience sampling method is utilized for data collection. The questionnaires will be randomly distributed in each restaurant at the exit door after the tourists have finished their payments session. Hence, this study could expose the entire dining experience, satisfaction and their post dining behaviour at an aggregate level. The owners/ managers will be contacted first to obtain permission to conduct the survey in their establishments. Restaurant owners and selected employees will be asked if the tourists are willing to participate in the survey before the questionnaires are given to them. The respondents who participated in the study must be at least 21 years of age. Potential participants will be informed that their participation is on voluntary basis and their answers are confidential. The patrons will be asked to return the questionnaires to the staffs or the researcher. To avoid any biases, the survey is to be administered on weekdays during the lunch hours.

3.2. Measurement

The self-administered questionnaire will consist of multiple choices and a 7-point Likert scale. The questionnaire will comprise four sections: demographic profile, perception of restaurant attributes, customer satisfaction and behavioural intentions. The first section of the questionnaire is related to respondents' relevant personal information: gender, age, race, education level, monthly income, dining companion and frequency of dining in the restaurant. The second section encompasses tourist perceptions of restaurant attributes which are made up of food quality attributes, service quality attributes, atmospheric attributes and perceived price fairness. The restaurant attributes are adapted and adopted from previous research on satisfaction and behavioural intention in restaurant organizations (Kivela et al., 1999; Raajpoot, 2002; Ryu, Han & Kim, 2008).

Section 3 will deal with the overall satisfaction related to the Nyonya restaurants. Customer satisfaction will be measured with four items of Oliver's (1980) perceived disconfirmation theory (Ryu, et al., 2008) whereby the items are modified to properly fit with the restaurant situations. The items are ''I am satisfied with this restaurant,'' ''The restaurant put me in good mood," "I am pleased to have visited this restaurant'' and "I really enjoyed myself at this restaurant." The fourth section will determine the behavioural intentions of tourists based on their responses to three items modified from Zeithaml, et al., (1996): ''I would like to come back to this restaurant in the future,'' ''I would recommend this restaurant to my friends or others,'' and ''I would say positive things about this restaurant to others.'' The items of restaurant attributes, customer satisfaction and behavioural intentions will be measured using a 7-point Likert-type scale, where 1 = strongly disagree and 7 = strongly agree. The questionnaire will be written in English.

3.3. Data Analysis

The data collected will be coded using Statistical Package for Social Science (SPSS) version 22. The data will be analysed according to the research objectives and questions. An exploratory factor analysis will be used to determine the underlying factors of restaurant attributes. The adequacy of applying factor analysis is determined by the Kaiser Meyer Olkin (KMO) measure of sampling adequacy (MSA) and Bartlett's test of sphericity. Stepwise multiple regression is used to identify the attributes that affect customer satisfaction and behavioural intentions. Finally, the relationship between customer satisfaction and behavioural intentions are to be tested with a simple linear regression analysis.

4. Conclusion

This study aims to assist Nyonya restaurant operators in ascertaining what their customers want and expect from a dining experience which encompasses their overall experience, starting with the quality of food and service to the restaurant environment. By identifying dimensions that give rise to customer satisfaction in restaurants together with the qualities that make up these explicit dimensions of satisfaction, this study can provide constructive knowledge for management to take effective actions to improve customer satisfaction. Besides identification of the attributes that matter most to customers, a thorough research on customer satisfaction will reveal the relative weight that the attributes have on the fulfilment level of the customers. Such study will not only provide important useful managerial implications for Nyonya restaurateurs but also supports interface between the restaurateurs and customers. Integration of customer satisfaction into stratagems and operations of organizations will undoubtedly sustain the competitive advantage and enduring profitability of a firm.

Managers must carefully analyse the resources obtained and tackle the areas or attributes which will have the largest weight on satisfaction after costs and risks have been taken into consideration. Securing a good satisfaction data can give way to practical action plans and improved resource-planning decisions, making cost and quality controls more effective. Once the areas where improvements are needed are identified, they can develop strategies and execute plans that would best entice the customers. They will be able to provide appropriate products or best practices that accommodate patrons' preferences and demands towards Nyonya restaurants. Problems with respect to customer dissatisfaction can be assuaged. Satisfied customers will also lead to positive behavioural intentions in the latter and earning their loyalty in the long run. Besides retaining the old customers, these customers might also draw new customers to the restaurants through words of mouth. Nevertheless, restaurateurs must remember that attracting customers and keep them are a whole different matter. Building and sustaining relationships with customers is no simple matter unless they have a comprehensive understanding of the decision processes that is utilized by the customers in their evaluation of their dining experience.

Profitability will also be increased by the augmentation of operational and marketing efficiency. With the extra revenue generated, greater market share can be procured, enabling restaurateurs to expand their businesses. Extra profit can be invested in areas which could further revitalize or maximize the revenue of the restaurants. These efforts are crucial in the bid to success in foodservice operations in today's competitive environment besides positioning themselves to take advantage of this growing worldwide trend towards eating ethnic foods. The extraordinary rate of failure in the foodservice industry proposes that the task to transform customer satisfaction into monetary success is elusive. It is hoped that this study will encourage other researchers to carry out similar studies in different ethnic restaurants in Malaysia.

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ETHNO-TOURISM: A REVIEW ON NATURAL RESOURCES USE PATTERN BY INDIGENOUS COMMUNITY IN PENINSULAR MALAYSIA

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Keywords: Ethno-tourism, indigenous people, traditional knowledge, natural resources and sustainability livelihood.

ABSTRACT

Tourism involving local community culture is an important tourism industry in many countries, which is simply referred to as ethno-tourism. The indigenous people may become one of the attractions in the tourism industry due to their unique cultures, tradition and heritage. Indigenous people of Peninsular Malaysia (or Orang Asli in Malay) are well known as a community with great traditional knowledge regarding the forest and its component. There is lack of research on natural resources utilisation by the indigenous people in Malaysia. This paper aims to provide a review on natural resource utilisation by the indigenous people in Peninsular Malaysia based on documents from previous studies. The finding of the present study presents more than 200 species of plants and a total of 20 species of animals known to be significant towards the well-being of the indigenous peoples. The natural resources play an important role towards the sustainability of livelihood of the indigenous peoples in term of economic, social and food-security. Also, this paper highlights the role and involvement of the indigenous peoples in promoting the sustainability of the tourism based on their traditional knowledge.

1. Introduction

Tourism is known as one way to promote the culture, tradition and heritage of a community in a country. Historically, tourism that involves the local community aspect has become one of the important tourism industries in many countries. The role or involvement of the local community in tourism is widely studied and referred as ethno-tourism, which is defined as an activity that focuses on human-based works rather than nature to provide tourist an understanding about the lifestyles of the local community (Bolnick, 2003).

In addition, ethno-tourism provides cultural exchange activities with the local community. In relation to that, the interest and involvement of local communities should be considered as one of the crucial requirements to ensure the tourism plan becomes effective and successful (Wight, 1993). For instance, in Kenya, the local community involvement in wildlife-based tourism is important to achieve the desired sustainable tourism (Korir et al., 2013). This may have emphasized that successful tourism could be achieved in sustainable way through the participation of local community. Basically, the tourism industry was recognized as an important industry for the economic well-being of the country. Tourism can provide advantages to tourists in terms of knowledge, experience and satisfaction.

Biodiversity based-tourism industry is receiving much attention. Peninsular Malaysia is rich with one of the greatest biodiversity. It also has great potential as habitat for various types of endangered and rare species. Besides that, Peninsular Malaysia houses communities of indigenous peoples which are well-known as Orang Asli. The Orang Asli are one of the earliest pioneers in Peninsular Malaysia with some of their groups dating back to at least 25, 000 years (Nicholas, 2000). The Orang Asli is also referred as the minority people and are well-known as the 'first people or 'original people. The Orang Asli in Peninsular Malaysia is made up of three main groups which consist of the Negrito, Senoi and Malay-Proto (Carey, 1976). Each group comprises of six sub-ethnic or tribes with their great cultures, beliefs, languages, traditions, and lifestyle. Tribes in the Negrito group consist of Kintak, Kensiu, Jahai, Medrik, Batek and Lanoh while the Senoi group consists of Semai, Temiar, Jah Hut, Ma'Betise, Chewong and Semaq Beri. For the proto-malay, the tribe consists of Temuan, Jakun, Semelai, Orang Seletar, Orang Kuala and Orang Kanaq. The Orang Asli distribution in Peninsular Malaysia is as shown in Figure 1.

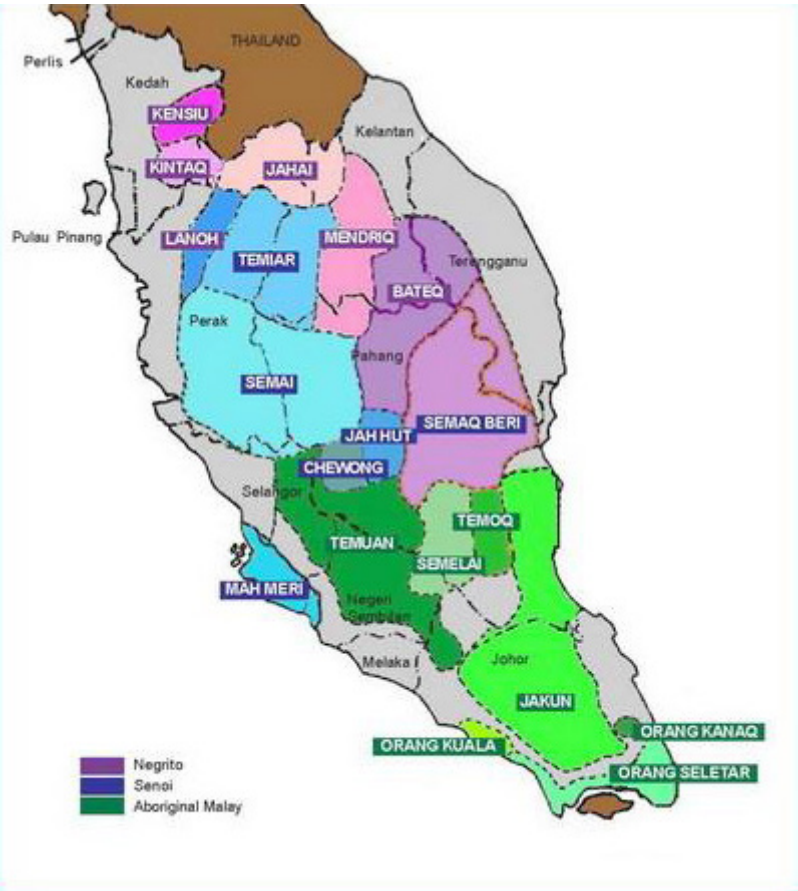

Figure 1 Orang Asli ethnic and sub-ethinic distribution in Peninsular Malaysia
Source: Jabatan Kemajuan Orang Asli, 2012

Traditionally, the indigenous communities lived in rural areas where several families lived together. Back then, their houses were built from bamboo and rattan obtained from the natural forest. Each house represents one family living together. They possess nomadic behaviour where they move from one place to another. Each village has a head or chief that lead the populations to manage and regulate the life of the community. Originally, indigenous people are hunter gatherer and collectors of many types of forest resources, which are important component of their livelihood. Recently, the indigenous peoples have remained active in hunting and collecting the forest products for sustainability of their livelihood. Gathering of non-timber forest products (NTFP) has an important role in many aspects of indigenous community especially for their subsistence. Indigenous peoples are also greatly known as one of the hardcore users of the natural forest resources. According to the report from the Department of Statistics Malaysia (2010), 1.4% of the indigenous community nationwide was classified as poor community. In Pahang alone, 35.2% out of 76.9% of the indigenous peoples were recorded living in hard-core conditions. Hence, poverty alone can become the main reason affecting the use of natural resources among the indigenous people.

At present, the use of natural resources is widely discussed in terms of providing benefits to mankind for sustainability of livelihood. In terms of the indigenous people's resources utilisation, there are varieties of forest resources that are important to the life of indigenous peoples and this can be highlighted in the tourism aspect. Through the tourism sector, awareness and education as well as conservation efforts can be implemented to conserve the available resources so that it may not compromise their livelihood.

Recently, many studies have been conducted concerning the utilisation of the natural resources by the indigenous peoples but few discussed the factors affecting their resource utilisation and the importance of the resources to sustain their livelihood. Natural resources are important component to fulfil the life requirements of the indigenous peoples. In addition, it is undeniable that natural resources are closely related to their sustainable livelihood. They basically acquire various resources at the edge of the tropical forests. This may emphasize that the indigenous peoples are forest-dependent community (Kuchikura, 1986; Ramle et al., 2014a). The Batek Orang Asli in Pahang refer themselves as the forest peoples (Lye, 1998) because of what had been ordered by the superhuman beings. They believed the superhuman beings or the spirit is the one who created them and the nature surrounding them.

2. Traditional Knowledge of the Indigenous People

Traditional knowledge (TK) or also known as the local ecological knowledge (LEK) involves engaging the local community. Traditional knowledge is defined as knowledge as well as the beliefs about the relationships of living things with one another or with their surrounding environments (Kai et al., 2014). The knowledge is also recognized as knowledge inherited from generations to generations where the knowledge includes the traditional knowledge on forest, the components, ecology and wildlife (Kardooni et al., 2014). The traditional knowledge is usually passed verbally to the younger generation or learnt from the elders. The indigenous people are greatly known as a community with their very own traditional knowledge in many aspects. As for the Batek tribe, they acquire the knowledge through many ways, such as observation, imitation, learning from specific mentor and the most important is through direct hands-on experiences usually obtained when moving in and out of the forest (Lye, 2002). Examples of the indigenous traditional knowledge are knowledge on harvesting and collecting forest resources, survival while moving in and out of the forest, conducting economic activities such as making handicraft, carrying out traditional hunting of wildlife, using various types of forest resources as medicine and knowledge on the universe.

There are many important types of forest resources to the indigenous people's livelihood that have been recorded related to their traditional knowledge. The resources consist of various types of plants and animals which historically used as food, medicine, pet, ornamentals, and tools. Ideally, it is important to conserve the traditional knowledge of the indigenous community and properly document their traditional knowledge as a record for future use and benefit. The traditional knowledge is crucial for the use of future planning of any development activities since the traditional knowledge studied could be extrapolated so it can benefit the present generation (Lohani et al., 2008). Through the preservation of the traditional knowledge, the culture and heritage of the indigenous knowledge can be maintained and well conserved. This can be achieved when there is s continuously transfer of knowledge from the elder to the younger generation.

The use of natural resources as food and medicine is a part of the indigenous people's traditional ecological knowledge. The traditional knowledge is well practiced to ensure the sustainability of their livelihood. The Temuan Orang Asli has interesting knowledge on traditional medicine that uses 47 species of plants, and 12 species of animals (Azliza et al., 2012). They use the natural resources to treat many types of diseases such as diabetes, hypertension, asthma and cold. Besides that, the traditional knowledge of the indigenous peoples also includes their practices, beliefs and culture. They have practiced their culture inherited from their ancestors until today where the practices reflect their original identity as original peoples of land. For example, the taboos or belief of Semaq Beri Orang Asli have been discussed in a previous study (Ramle et al. 2014b). They strongly believed in the *Semaq hala,* the spirits which give orders to them and a responsible superhuman being that protects all the resources in the forests. All the taboos should be obeyed, so they do not provoke the spirits to prevent any unexpected disaster. Furthermore, Hood (1995) also discussed the sustainable way of the Orang Asli harvesting the forest resources according their belief. Hence, they shall withdraw the forest resources only with purposes. Indigenous people's practices are strongly related to their beliefs in superhuman power or spirits who gives order to them to practice so.

3. Methods of Resources Utilisation

Various tools and methods are used by the indigenous people to utilise the forest resources. Basically, the indigenous peoples only use simple tools to utilise the resources which are the traditional methods that had been practiced from their ancestor. For instance, indigenous people use the blowpipe made from bamboo to hunt for animals. Besides that, they set up traps to harvest the terrestrial animals, for example porcupine and mouse deer; deployed traditional traps to harvest aquatic resources such as *bubu* and they also use hands to utilise animals like pangolin and the tortoise. The skills and strategies are usually learnt from their parents (Ramle et al., 2014a).

Previously, the Semaq Beri Orang Asli applied the rod-and-line fishing method and *tawar* to capture the fishes (Kuchikura, 1996). Other than animals, they frequently harvest forest resources such as woods, chandan, rattan and bamboo. At present, several commonly used tools by the Orang Asli recorded on a daily basis are sumpit, snare, traps, fishing net, traditional trap which is the *bubu*, gill nets and knife. Besides the utilisation purposes, the tools were also used as a protection tool while moving in and out of the forest. Most of the tools were made from forest products such as bamboo and rattan. The summary of tools used by the indigenous peoples is as shown in Table 1. Similar method has been recorded in most of the Orang Asli groups for example the *bubu* and blowpipe practiced by the Jakun Orang Asli in Kampung Peta in the state of Johor (Siti Aminah et al., 2013). The tools can be referred as material culture practices by the Orang Asli. There is no record of the use of shot gun by the Orang Asli. Ramle et al. (2014a) had widely discussed the approach used by the Orang Asli of Semaq Beri tribe in obtaining the resources in a sustainable way. Therefore, the utilisation practices by the indigenous people may emphasize the sustainable use of their resource which are still practiced till these days.

Table 1 List of tools used by the Orang Asli in their daily activities

Tools/ Weapons	Uses	Tribes
Sumpit	To hunt terrestrial mammals and arboreal animals such as squirrel and bird. Also, it is used as a weapon for protection while walking in and out of the forest.	Jakun, Semaq Beri, Batek
Bubu	To trap the fishes.	Jakun, Semaq Beri
Spear gun	To hunt larger mammals and also used to hunt fishes while in the water.	Semaq Beri
Fishing Rod	Used to catch fishes in the river	Semaq Beri
Gill net	To harvest fishes	Semaq Beri
Snare	To trap terrestrial mammals such as porcupine and deer. Also, it been used to catch the birds.	Semaq Beri
Traps	Used to hunt various types of animals, including terrestrial birds.	Semaq Beri

Source: Adopted from Ramle et al., 2014a

4. Non-timber Forest Products (NTFP) Utilisation

Indigenous people harvest various types of wild plant and animals, as well as the aquatic resources. All the available resources are crucial mainly for the sustainability of their livelihood. The dependence on forest by the indigenous peoples is widely studied (Ramle Abdullah et al., 2014b). All the resources utilised and obtained from the forest by the indigenous peoples are referred to as Non-Timber Forest Products that consist of both plants and animals. Arnold and Ruiz (1996) defined the Non-timber Forest Products (NTFP) as any non-timber product which is dependent on a forest environment. Examples of the NTFP are gaharu, rattan, honey, bamboo, fruits, a variety of herbal plants and meat sources such as deer, porcupine and wild boar. The NTFPs has many useful properties and are important to mankind in many aspects.

The common forest resources utilised by the indigenous peoples are rattan (*Calamus* sp), agarwood (*Aquilaria malaccensis*) and bamboo (*Bambusa* sp). Besides that, many types of herbal plants were utilised for medicinal purposes. The current ethnobotany study in Peninsular Malaysia had recorded more than 200 plant species utilised by the indigenous peoples for medicinal purposes to treat various illnesses such as hypertension, diabetes, stomach ache, diarrhoea and fever (Howell et al., 2010; Samuel et al., 2010; Azliza et al., 2012; Ong et al., 2012). The example of plant species used as medicines are shown in Table 2. The potential plant resources harvested by the indigenous people used as medicine may contribute to their well-being. Local community in Borneo also utilised a variety of plant species for medicine. A total of 132 species of useful plants recorded in a survey among the Murut Community (Julius, 2003). Another study conducted by Julius et al. (2010) in Maliau Basin, Sabah recorded a total of 55 species of medicinal plants. Both the findings also recorded several similar species utilised by the indigenous peoples in Peninsular Malaysia such as *Eurycoma longifolia* and *Aquilaria malaccensis*. There are more than 1700 species of plants and animals with more than 5000 uses found in the Malaysian forest (Burkill, 1935). Other than medicine, many plant resources were also used for various purposes, including roof thatching, handicraft, and construction materials and as their source of income (see Table 3).

Table 2 List of plants species utilised as medicine listed in IUCN Red List status

Order	Family	Species	Local name	Tribes	Uses	IUCN Status
Acorales	Araceae	*Acorus calamus*	Jerangau	Semai	Used as talisman for healing ritual	LC
Malpighiales	Clusiaceae	*Garcinia scortechinii*	Akar senggugut	Jah Hut	Treat painful menses and use as an abortifacient	LC
Malpighiales	Euphorbiaceae	*Euphorbia tirucalli*	Mentulang	Semang	Remove warts	LC
Schizaeles	Lygodiaceae	*Lygodium circinnatum*	Coonk ribu	Semai	Used for ritual healing	LC
Marattiales	Marattiaceae	*Angiopteris evecta*	Paku gajah	Temuan	Ringworm and *Tinea versicolor*	CR
Sapindales	Meliaceae	*Aglaia odorata*	Pacar cina	Semang	Help reduce fever	NT
Malpighiales	Rhizophoraceae	*Pellacalyx saccardianus*	Leng'am	Semai	Used to bath post-partum mothers	LC
Malvales	Thymelaeaceae	*Aquilaria malaccensis*	Pokok gaharu	Semai/ Jah Hut	Treat various ailments	VU

* IUCN Red List category:
Near threatened = NT
Vulnerable = VU
Least concern = LC

Sources: Adopted from Howell et al. (2010); Samuel et al. (2010); Azliza et al. (2012) and Ong et al. (2012)

Table 3 The examples of plants resources utilised by the Orang Asli

Order	Family	Species Name	Common/ Local Name	Uses
Arecales	Arecaeae	*Calamus* sp	Rotan	Income/ Handicraff/ Furniture/ Construction materials
		Salacca zalacca	Salak	Food/Income/ Handicraff
Ericales	Sapotaceae	*Palaquium gutta*	Gutta-percha	Income
Fabales	Fabaceae	*Parkia speciosa*	Petai	Foods/Income
		Pithecellobium jiringa	Kerdas	Foods/Income
		Pithecellobium bubalinum	Buah jering	Foods/Dye
Malpighiales	Euphorbiaceae	*Manihot esculenta*	Pokok ubi	Food/Income
Malvales	Thymelaeaceae	*Aquilaria malaccencis*	Pokok gaharu	Income/ Incense
Poales	Poaceae	*Bambusa* sp	Bambu	Income/ Construction materials
Sapindales	Anacardiaceae	*Bouea macrophylla*	Kundang	Food/Income
		Calamus castaneu	Cucuh	Handicraff/ Roof thatching
	Simaroubaceae	*Eurycoma longifolia*	Ubi jaga	Income

Source: Adopted from Howell et al., 2010

Animal resources are also important sources of living for the indigenous peoples. The animal resources are continuously used by mankind throughout history until today. There are many studies that record a number of useful animals in the life of the indigenous peoples for various purposes such as food, pet, ornamentals, sources of income and also for medicine. The Garasiya people, the main tribal group in India have utilised over 24 species of animals for medicinal purposes (Jaroli et al., 2010). There are some protected mammals recorded such as the elephant, monkey and sambar deer. In relation of that, Bagde and Jain (2013) recorded 30 species of wildlife utilised by the dweller to treat various illnesses such as fever, jaundice, diarrhoea, impotency, asthma and allergy. Another study conducted by Kim and Song (2013) also revealed that animals are not only consumed as food, but also used in healing practices by the indigenous peoples as the practices are applied from their existed traditional knowledge.

According to previous researches (Howell et al., 2010; Azliza et al., 2012; Fatan Hamamah, 2015), there are a total of 12 species of wildlife utilised by the indigenous peoples for medicinal purposes (see Table 4). Besides that, there are 10 species of animals utilised by the indigenous peoples for their own consumption. Other purposes of the animal utilisation are for trading and even kept as pets. The summary of the types of wildlife resources utilised by the indigenous people are shown in Table 5. Among all the animals (listed in Table 4), there are some species of these animals that are totally protected and have been listed as critically endangered under IUCN Red List (*Manis javanica*). Aziz et al. (2013) recognized there are some weaknesses in the legislation for the management of the natural resources affecting the indigenous peoples' right. Therefore, it is crucial to properly document the data on wildlife utilisation by the indigenous peoples so it can help review the law relating to wildlife utilisation by the indigenous people. The aim is to help improve and provide recommendation for better life of the indigenous people without compromising the sustainability of the animals to sustain their livelihood.

It is the same in Sarawak, where several animals are important source of living for the indigenous community (Mohd Azlan & Muhammad Faisal, 2006). For example, animals become an important source for household consumption in the rural community. Besides revealing the total of 55 species of wildlife consumed in the diet of the rural community, there are also 52 species utilised for medicinal purposes. The examples of these animals are python, porcupine, Malayan water monitor and salt water crocodile. Other than that, the animals utilised as tools and decorative materials. As discussed by Pederson (2004), wildlife products that were readily available including horn, bone, ivory, antler and feather have been used by humans as ornaments and decorative materials since prehistoric times. Few parts of the animals such as feathers and horns of the hornbill are potentially kept as decorative materials.

Table 4 Taxonomic list of animals utilised by the Orang Asli for medicinal purposes

Order	Family	Scientific name	English name	Uses	Tribes	IUCN Status
Perciformes	Channidae	*Channa striata*	Common snakehead	Increase wound healing	Lanoh/Temiar	LC
		Channa gachua	Dwarf snakehead	Increase wound healing	Lanoh/Temiar/ Temuan	LC
Stylommatophora	Achatinidae	*Achatina fulica*	Land snail	Treat asthma and breathlessness	Temuan	-
Blattodae	Termitidae	*Termes* sp	Termite	Enhance fertility	Temuan	LC
Scolopendromorpha	Scolopendridae	*Scolopendra* sp	Centipede	Treat asthma and breathlessness	Temuan	-
Squamata	Pythonidae	*Python reticulatus*	Reticulated phyton	Treat various diseases such as hypertension	Lanoh/Temiar	-
		Python brongersmai	Red short-tailed python	Treat cold	Temuan	LC
Bucerotiformes	Bucerotidae	*Rhinoplax vigil*	Helmented hornbill	Used to detect poison	Temuan	CR
Pholidota	Manidae	*Manis javanica*	Malayan pangolin	Treat internal injury and used as talisman for protection	Jah Hut	CR
Primates	Lorisidae	*Nycticebus coucang*	Slow loris	Treat wound	Temuan	VU
Rodentia	Hystricidae	*Hystrix brachyura*	Porcupine	Treat various illnesses such as fever, asthma and headache	Temuan	LC
	Sciuridae	*Ratufa bicolor*	Malayan giant squirrel	Treat breathlessness	Temuan	NT

*IUCN Categories: Least Concern (LC), Vulnerable (VU), Near Threatened (NT), Critically Endangered (CR)

Source: Adopted from Howell *et al*., 2010; Azliza *et al*., 2012; Fatan Hamamah, 2015

Table 5 Taxonomic list of summary of the wildlife utilised by Orang Asli for various purposes based on previous studies
(I: Food, II: Medicine, III: Trading, IV: Pet)

Class	Order	Family	Scientific name	English name	Uses	WCA (2010)	IUCN Status
Fishes	Perciformes	Channidae	*Channa striata*	Common snakehead	II	-	LC
			Channa gachua	Dwart snakehead	II	-	LC
Gastropoda	Stylommatophora	Achatinidae	*Achatina fulica*	Land snail	II	TPA	-
Insecta	Blattodae	Termitidae	*Termes* spp.	Termite	II	-	LC
	Scolopendromorpha	Scolopendridae	*Scolopendra* spp.	Centipede	II	-	-
Reptiles	Testudines	Geoemydidae	*Batagur baska*	Terrapin	I IV	TPA	CR
		Testudinidae	*Testudo* spp.	Tortoise	I IV	PA	-
	Squamata	Varanidae	*Varanus salvator*	Water monitor lizard	I III	PA	LC
		Pythonidae	*Python reticulatus*	Reticulated Python	II	PA	-
			Python brongersmai	Red short-tailed python	II	TPA	LC
Aves	Bucerotiformes	Bucerotidae	*Rhinoplax vigil*	Helmented hornbill	II	TPA	NT
	Artiodactyla	Tragulidae	*Tragulus napu*	Mouse deer	I	TPA	LC
		Cervidae	*Muntiacus munctjak*	Barking deer	I	PA	LC
		Suidae	*Sus scrofa*	Wild Boar	I III	TPA	LC
	Pholidota	Manidae	*Manis javanica*	Malayan pangolin	I II III	TPA	CR
	Primates	Cercopithecidae	*Macaca fascicularis*	Long-tailed macaque	I IV	PA	LC
		Lorisidae	*Nycticebus coucang*	Slow Loris	II	TPA	VU
	Rodentia	Hystricidae	*Hystrix brachyura*	Porcupine	I II	PA	LC
		Sciuridae	*Ratufa bicolour*	Black giant squirrel	II	TPA	NT
			Callosciurus notatus	Plantain squirrel	I	TPA	LC

*Wildlife Conservation Act (2010) categories: Protected Animals (PA), Totally Protected Animals (TPA)
*IUCN Categories: Least Concern (LC), Vulnerable (VU), Near Threatened (NT), Critically Endangered Species (CR)

Source: Adopted from Howell *et al*., 2010; Azliza *et al*., 2012; Fatan Hamamah, 2015

5. Sustainability Livelihood of the Indigenous People

Natural resources play an important role in various aspects of local communities, especially in term of sustainability of their livelihood. Chambers and Conway (1991) defined sustainability as a function of how both assets and capabilities are used, maintain and enhanced to preserve the livelihood. The term livelihood often relates to capabilities, assets and activities which is required for living. The livelihood is said to be sustainable when it copes with and recovers from stresses and shocks, maintains or enhances its capabilities and assets. According to sustainable livelihood framework, it means to provide more incomes, increase well-being, reduce vulnerability, improve food security and more sustainable use of the natural resources. In terms of sustainable livelihood of the indigenous people, the utilisation of the forest resources has contributed to their sustainable livelihood as there are many important forest resources that are useful to the indigenous people in many aspects. The natural resources have been very much associated with livelihood of the indigenous community. Sustainable livelihood is defined as a method of development that relates all aspects of the human livelihood and how peoples obtained them (Nik Fuad *et al*. 2011). Various aspects have been considered to achieve sustainable livelihoods which are the human basic need, food security, sustainable agriculture practice and poverty.

There are many factors affecting the forest resource utilisation by the indigenous peoples. The purpose or reasons leading to the resources utilisation are strongly related to their sustainability livelihood. Besides that, the traditional knowledge or local ecological knowledge of the indigenous peoples also affects their resource harvesting pattern. For example, the knowledge of their hunting and gathering of forest resources approach enable them to utilise the resources easily. The resources are not only important for their own consumption, but also contribute to their socio-economic well-being. In the economic aspect, the resources become their source of income to fulfil other life requirements.

The indigenous peoples utilised the resources as their main sources of living. As stated earlier, the indigenous peoples are knowledgeable when it comes to forest as forest gives greater significance of their life as the original peoples. They have a lot of information on which and what types of available resources can be used. Other than that, the non-timber forest products (NTFPs) are crucial for their food security. The food security is very important for their sustainability of livelihood where it should be highlighted that the resources need to be conserved to safeguard the food security which directly may sustain their life.

6. Indigenous People Save Tourism?

Previously, the importance and role of tourism in promoting the indigenous peoples' livelihood had been discussed. One way is by promoting their unique culture and lifestyle via the implementation of conservation efforts to conserve their traditional knowledge. The impact of tourism development towards the Orang Asli in Cameron Highland showed positive results (Norlida Hanim et al., 2012). The Orang Asli gained benefits in terms of their economic well-being, increment in their physical as well as social assets. Other than that, the Orang Asli is also able to manage the threats to the sustainability of their livelihood. Besides that, the livelihood of the Orang Asli can be seen in their local practices and culture. The traditional practices and culture can be promoted through tourism sector by highlighting the importance of resources surrounding them. As an example, ecotourism provides better livelihood to the Jakun community in Tasik Chini (Habibah et al., 2010).

Indigenous peoples are also able to promote the sustainability of tourism and directly save the industry. A statement as to whether the indigenous people may help promote the sustainability of tourism, 'Is the indigenous people saving tourism?' As the tourism industry provides benefits to indigenous peoples' livelihood, the win-win situation can be achieved between both the tourism industry and the indigenous peoples' livelihood. For instance, the Orang Asli participation supports the sustainability of tourism in Tasik Chini (Norlida Hanim et al., 2012). As sustainable tourism requires the participation of local community, the indigenous peoples may become one of the medium to make tourism sustainable. Firstly, the forest dependence community possesses great traditional knowledge in many aspects. This traditional knowledge may be served as focal attractions in the tourism industry. The traditional knowledge of the indigenous peoples consists of many aspects including their knowledge of harvesting and collecting forest resources, survival while moving in and out of the forest, conducting the economic activities such as making handicraft, traditional hunting of wildlife, treatment using various types of natural resources and knowledge on the universe. By participating in the tourism industry, tourists may be exposed to the Orang Asli lifestyle which is based on hunting and collecting forest resources for their subsistence. They are also able to share experiences with the Orang Asli about their traditional knowledge. Thus, tourist may gain information, have better understanding and interpretation about the uniqueness of the Orang Asli. Tourist from outside of the country for example can become a medium to convey the information regarding the indigenous people's lifestyle to their citizens. Thus, peoples from other country would have desire to come to our country to see and view the indigenous peoples in the country.

The involvement or role of the indigenous people can be seen as a way to promote tourism. For instance, both male and female of the indigenous peoples have difference way and roles that can become an attraction in tourism. The Orang Asli especially the women Orang Asli play an important role in the tourism industry (Fatan and Liyana, 2014). The skill of the female Orang Asli have been addressed in providing tourism products such as handicrafts made from rattan and bamboo, traditional food, dance which is popularly known as *sewang* and they also may be actively involve as tourist guide. As an example, plant resources such as mengkuang can to be turned into baskets and mats. The *sewang* dance is one of their cultural practices which are usually used in many ceremonies such as death, wedding ceremony and during harvesting seasons. It also can be performed to entertain the tourists. Besides that, they are also very knowledgeable regarding the uses of the wild plants from the natural forest as medicine. This may become an attraction to the tourist to get to know the uses and value of natural resources. Several Orang Asli settlements located at Taman Negara Pahang which is open for visitors have become one of the major attractions in the tourism industry. A study conducted by Normala and Sofiah (2011) revealed the preferences of tourists visiting Taman Negara Pahang. Visiting the Orang Asli village falls into the highest top five activities preferred by the tourists as compared to the other 13 activities provided. This shows that the Orang Asli are categorized as one of the main attractions in tourism. Tourists are able to experience the lifestyle of the Orang Asli by participating in their activity, such as making firewood the traditional method as used by the Orang Asli. As a result, the willingness to pay of tourists for the experiences, goods, performance, delicacies and services goes into the tourism industry and directly benefits the Orang Asli as well.

In relation of that, Kamarudin (2013) highlighted the relationship of three important components to ensure sustainable eco-cultural tourism developments and they are the natural resources, community and tourism. This highly reflects the importance of local community involvement in tourism industry. For example, the indigenous people are known as a community with strong connection with the natural resources. Therefore, more efforts and researches are required to look deeper on the potential of the indigenous people as catalyst in successful tourism development. The involvement of the indigenous people should be taken into consideration and it is also important to give them the opportunity to be involved in the tourism industry via active participation in promoting their uniqueness as a major attraction in ethno-tourism. By doing that, the tourism industry can be expanded and not only focus on material culture, but also concerning the non-material culture. Thus, tourism industry of our country can continually develop.

7. Conclusions and Recommendations

The traditional knowledge of the indigenous people holds high value tourism. Through conservation of their traditional knowledge, their livelihood could be sustained. Tourism industry may promote conservation and give awareness to the public on the importance of culture to the humankind. The culture of the indigenous peoples should be preserved and this can be achieved through conservation and natural resources management. The aim is to conserve the practices and knowledge of the indigenous peoples for the benefit of future generation. Tourism may promote the existing culture of the country where it can benefit the socioeconomic well-being of the country. The indigenous peoples' lifestyle highly reflects their unique identity. Other than their tradition and customs, their dependence on natural resources also emphasizes their unique life. Tourism may affect the livelihood of the indigenous peoples in both positive and negative ways. Positively, tourism may help promote the culture and lifestyle of the indigenous people as well as safeguarding their livelihood. However, the tourism sector also may cause the decline of traditional knowledge of the indigenous peoples because development can change their natural environment. Therefore, the role and decision-making from the responsible parties are urgently needed to ensure the sustainability livelihood of the indigenous peoples.

Based on the review, the indigenous peoples are one of the hardcore users of forest resources. They also have their very own traditional knowledge which is acquired and practiced from their ancestors. Traditional knowledge of the indigenous peoples should be preserved and conserved for the benefit of mankind. The understanding of the importance of natural resources to the indigenous people is also very important to ensure the sustainability of their livelihood. A lot of qualitative study had been conducted, there is a need for more quantitative studies to quantify the resources utilised. The involvement of responsible law is also required to help improve the quality of life of the indigenous people. Therefore, by carrying out more studies related to natural used pattern by indigenous people, a clearer view on the importance of natural resources legislation affecting the indigenous peoples' right can be provided to help in decision-making processes.

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ETHNO-TOURISM: THE HISTORICAL AND CULTURAL EXPLORATION OF GUA BEWAH IN TASIK KENYIR, TERENGGANU

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Abstract

Gua Bewah in Tasik Kenyir, Terengganu holds unique geological heritage and yet it has not been fully discovered. The cave embedded in Bukit Bewah is shaped by limestone layers that is approximately 270 million years old. The history of Gua Bewah had been unlocked through the discovery of many fossils, evidence of human historic through the discovery of human remains and prehistoric human skeletons. This study predominantly contributes to the growing body of knowledge by inspiring the understanding of the potential of Gua Bewah as an ethno-tourism destination. In addition, this limestone cave can be promoted as a part of the natural resource that has ethno-tourism potential to boost the economy of the local economy as well as increase awareness and environmental conservation of the historical and culture that resides inside the limestone cave.

Keywords: Ethno-tourism, Gua Bewah, prehistoric human skeleton, fossils and Tasik Kenyir.

1. Introduction

Ethno-tourism is the field of tourism industry that focuses on excursion, concentrates on the works of traditional culture of humans rather than nature. It provides tourists the experience and understanding of the lifestyle of local people (Bolnick, 2003). Meanwhile, Cohen (1999) described ethnic (ethno) tourism as (1) a selection of tourism site where (2) the target cluster is not influenced by any culture, customs, social or politics of the majority population within a certain area boundaries and that (3) it is a tourist spot due to their cultural distinctiveness, individuality, singularity and uniqueness. Compared to the traditional forms of tourism, ethnic-tourism highlights on authentic experiences and the direct contact between tourists and the cultural traditional practices (Smith, 1997; Dong et al., 2003). The concept of ethno-tourism is parallel to the criteria of ecotourism but it is slightly different in terms of the target of attraction. In Blamey (1997, 2001) and Weaver and Lawton (2007), scholars have concluded that ecotourism supposedly satisfy three criteria, which are (1) the main attraction is primarily nature-based; (2) there is learning and education concept between tourist and the nature-based activities; and (3) the experience and product management should be compatible and corresponding with economic sustainability ideas, environmental and social-culture of the local community.

From the global point of view, ethno-tourism studies have been discussing on sustainable development (Vidal, 2012), economy development (Dong et al., 2003; Polukhina, 2013; Burusphat, 2014; Magomeddhapievna, 2014; Shykeryynets & Gumenyuk, 2014) and its potential (Garcia, 2009; Aleksandrova & Aigina, 2014). The implementation of ethno-tourism however is rarely used in the Malaysian tourism studies as it has been difficult for the conservation organizations, development agencies, government, publicity, scholars and tour operators to accept. They believe that the use of the new term might be confusing and that ecotourism itself has been described as a type of sustainable tourism that has undergone rapid modernization in conjunction with universal distresses on sustainability (Weaver, 2001). There are ethno-tourism programs in Taman Negara Kuala Tahan, Pahang. However, the communities do not realize that their visit to the Bateq Orang Asli villages is part of an ethno-tourism activity.

This study predominantly contributes to the growing body of knowledge by inspiring the understanding of the potential of Gua Bewah as an ethno-tourism destination for historical and cultural exploration. In addition, promoting this limestone cave as part of the natural resource would potentially boost the local economy as well as increase awareness and conservation of the environment, historical and culture that resides inside the limestone cave. Even though there are no aboriginal residents surrounding the limestone cave, this study tends to use up the scope of ethno-tourism by listing prehistoric human skeletons as one of the ethnic elements besides the aborigines.

2. Gua Bewah Physical Setting

Located on the south of Tasik Kenyir, Hulu Terengganu (4°51'3"N, 102°43'21"E), Gua Bewah or locally known as Gua Tahi Kelawar (Figure 1), is one of the limestone caves besides the Gua Taat (opposite Gua Bewah). Both caves are the only limestone caves present in Terengganu that becomes a landmark and "entrance gate" to the state park. It is compulsory for every tourist to report themselves to the Department of Wildlife and National Park (DWNP) which operates at the Tanjung Mentong. Before the Sultan Mahmud dam was built, the journey to Gua Bewah takes several days, travelling via river into the centre of peninsular. Since, the changes in the Kenyir landscape, tourists can reach the limestone cave in 70 minutes by speedboat.

2.1 Limestone cave

Gua Bewah is part of the Hulu Terengganu area. It is being mapped as an old sedimentary rock from Carbon, Cretaceous or Jurassic and Permian ages that consists of igneous and volcanic rocks (Mohd Sharoum et al., 2015). Most of the sedimentary rocks (termetamorf) are the dominant clastic (Carboniferous – Permian age; Jurassic – Cretaceous) and carbonate rock or limestone (Permian age) (Mohd Sharoum et al., 2015). Gua Bewah that resides in Bukit Bewah composed of limestone that consists of dolomite and calcite, several facies (Mohd Sharoum et al., 2015). Overall, the geology of Bukit Bewah is estimated to be approximately 270-260 million years old (Middle Permian) and is believed to be an old mainland seabed. However, the collision of the earth's crust and plate tectonic long time ago made the mainland seabed rise and formed the limestone hill. In addition, many fossils were reported to be surrounding Gua Bewah that consists of igneous dike (Mohd Sharoum et al., 2015).

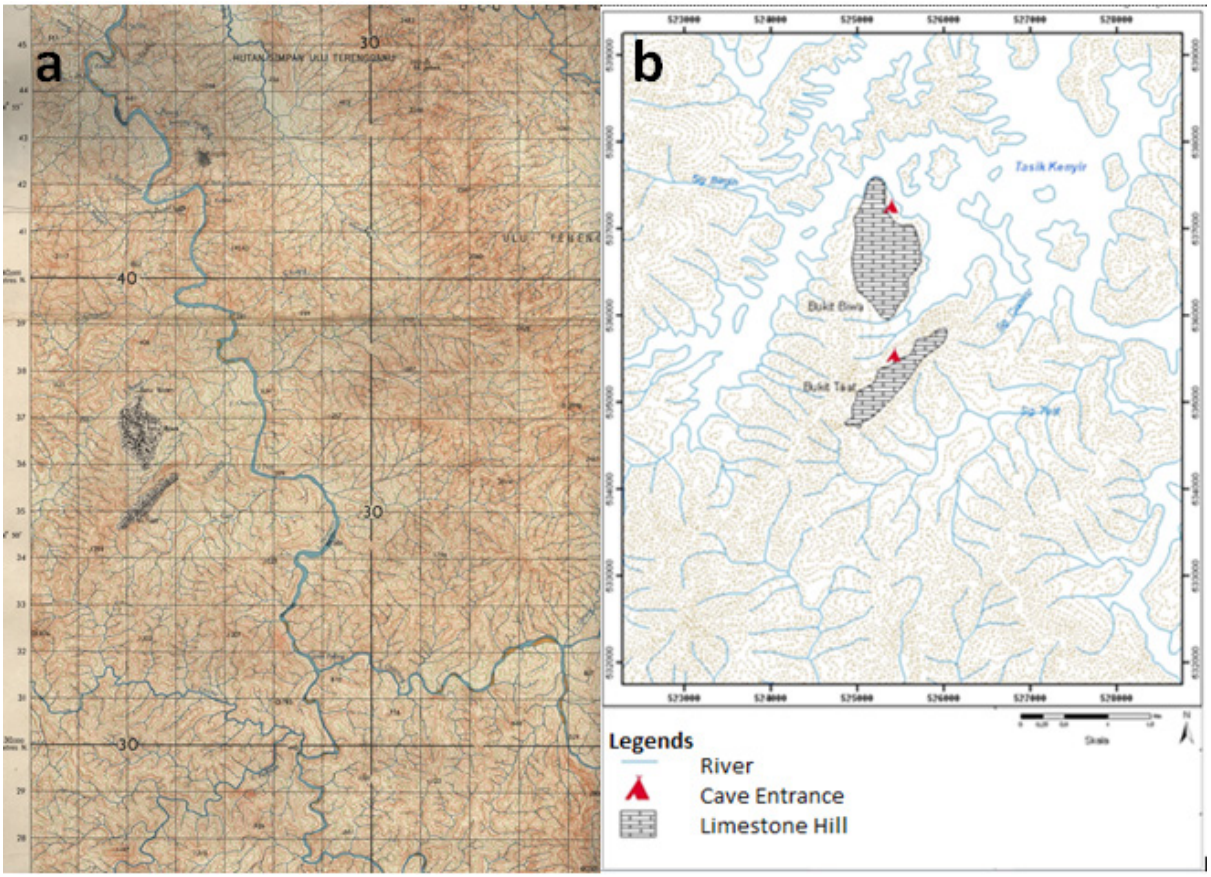

Figure 1 The location of Gua Bewah (rounded shape) before (a) and after (b) Tasik Kenyir dam being made (Adapted and modified from Lembaga Muzium Negeri Terengganu and Mohd Sharoum et al., 2015).

Fossils found in Gua Bewah consists of bivalve (*Tanchintongia* sp.), cephalopod, coral (*Amygdalophyllum* sp., *Lithostrotion* sp., *Pseudohuangia* sp. and *Yatsengia* sp.), foraminifera (*Agathammina* sp., *Climacammina* sp., *Globivalvulina* sp., *Parafusulina gigantean*, *Pseudodoliolina* sp., *Pseudofusulina* sp., *Schubertella* sp. and *Schwagerina* sp.); and gastropod (Figure 2 Mohd Sharoum et al., 2015).

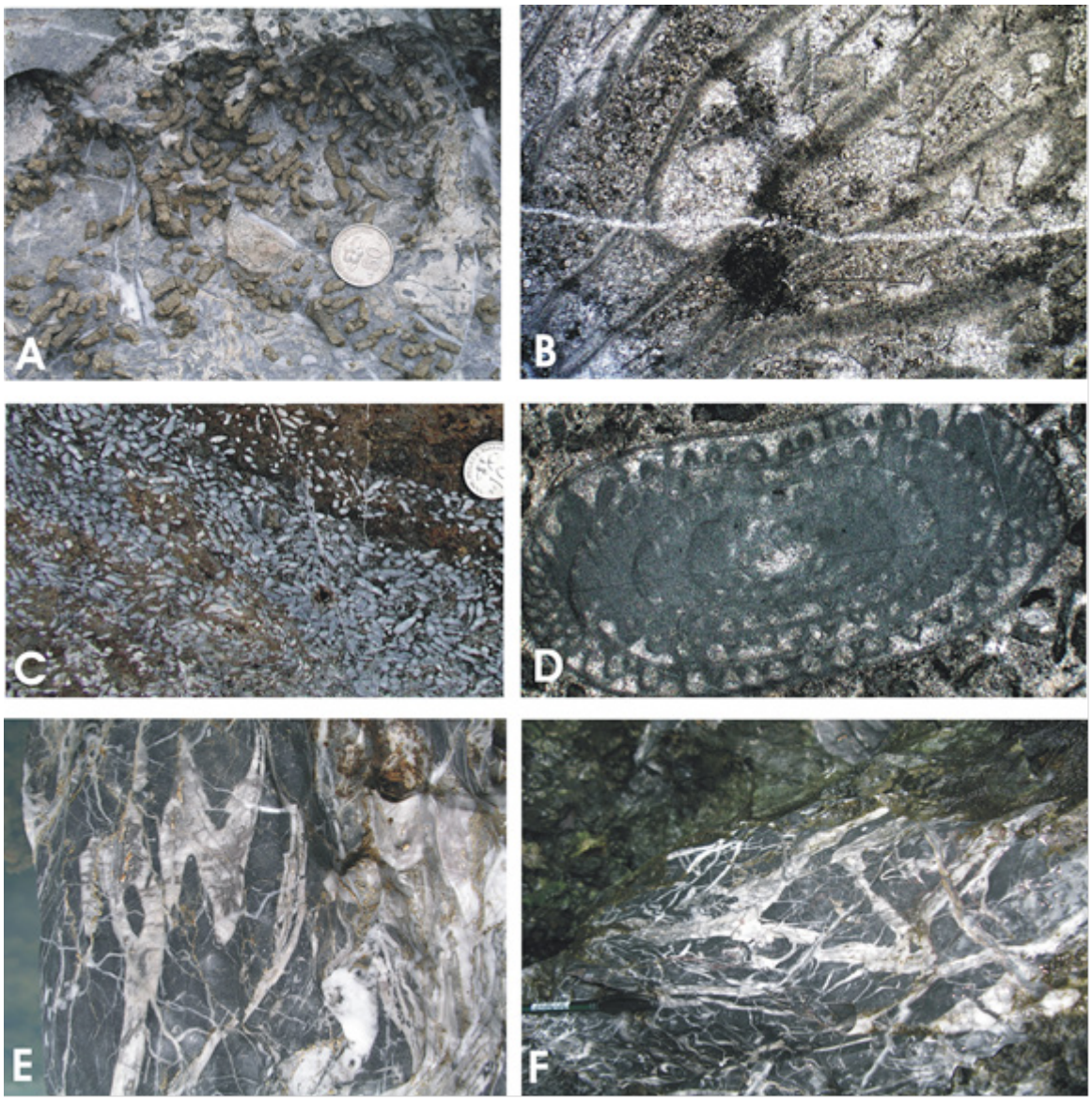

Figure 2 Fossil that exists at the Gua Bewah. (A) Shell, (B) Shell structure enlarged using microscope, (C) Phusulinid, (D) *Parafusulina* sp., (E) and (F) giant bivalve. (Adapted from Mohd Sharoum et al., 2015).

3. The Potential of Gua Bewah as an Ethno-Tourism

An excavation activity was conducted in late 2009 at Gua Bewah. As a result, an ancient human skeleton (Figure 3) was found in one of the archeological sites at a depth of around 65 to 70 cm. This ancient bone was believed to be a teenage girl, with its carbon dating approximately 16,000 years old (*Hoabinhian* period; Lembaga Muzium Negeri Terengganu, 2010). The girl was buried in a fetal position where both knees were tucked into the chest. Interestingly, this method was similar to an ancient skeleton found in Gua Cha, Kelantan with its carbon dating approximately 10,000 years old. Thus, there is a possibility that the Bewah human is the same population as the Cha human even though the time period is quite far from each other. Besides the Bewah human, archeologist also discovered some artifacts, fossils and ancient human skeletons in Gua Tok Bidan (beneath Gua Bewah) and Gua Taat (opposite). However, at present Gua Tok Bidan is submerged under water after the completion of the Sultan Mahmud dam.

Figure 3 Prehistoric Bewah Human found underneath the stone at the entrance of Gua Bewah. (Lembaga Muzium Negeri Terengganu, 2010)

Bewah Human may have some relationships or perhaps an ancestor to the Orang Asli (Bateq and Semaq Beri) that had settled in Kampung Sungai Berua, the edge of Tasik Kenyir. Previous studies on time divergence of Orang Asli shown in Kardooni et al. (2014) showed that researchers believed that there are links between the Orang Asli and *Hoabinhians* based on archeological evidence. *Hoabinhian* are "ancient people" that lived during the Middle Stone Age (8,000 and 1,000 BC). Allen (1879) and Hill et al. (2006) had raised a questioned whether these Orang Asli were connected to the first large wave of human migration from Africa or are they linked to the serial human Asian evolution. The *Negrito* or Semang group is a descendent from *Hoabinhian* and shared some similar physical appeals with a population of pigmy African (Allen, 1879; Fix, 1995). This group formed the first settlement of coastal inhabitants, but were forced to go inland and isolated to the northern Malay Peninsula (Carey, 1976; Fix, 1995).

Previous excavation has found evidence of pebbles, unifies tools, stone hammer and anvil believed to be used by public collector hunter for hunting, skinning and preparing food. This is proven by the discovery of various animal bones, charcoal and snails (Isa, 2011). Based on the archaeological findings, it is proposed that the Bewah human was part of a group of hunters and collectors that always forage within the area covered by the limestone mountain luxury complex, such as Hulu Terengganu, Hulu Kelantan and Hulu Tembeling, Pahang. The subsistence foraging patterns and the major public expenditure patterns results the hunter making the limestone caves as their temporary camp. Based on the historical evidence, ethnography is also a way of life practiced by the collector aboriginal hunters (Isa, 2011).

4. Biodiversity surrounding Gua Bewah

4.1. Flora

A total of 169 species of flora can be found around the Bukit Bewah and Bukit Taat and it is dominated by families of Anacardiaceae, Annonaceae, Euphorbiaceae, Fabaceae, Lauraceae, Rubiaceae and Sterlculiaceae (Mohd Sharoum et al., 2015). *Aralidium pinnatifitidum*, *Artocarpus rigidus*, *Baccaurea macrocarpa*, *Dillenia* reticulate, *Ficus vasculosa*, *Intsia palembanica*, *Parameria leavigata* and *Piper porphyrophyllum* are types of species that can be found in Bukit Bewah and Bukit Taat vegetation (Mohd Sharoum et al., 2015).

4.2. Fauna

Norfarhana *et al*. (2015) recorded 14 species of bats at Bukit Taat where *Hipposideros larvatus* was found to be the most abundant species. Mohd Sharoum et al. (2015) added *Megaderma lyra* (Chiroptera), *Orthriophis taeniurus ridleyi* (Squamata), Rhaphidophoridae (Orthoptera); and Araneae and Amblypygi (Arachnida) to the list of fauna recorded in Gua Bewah and Gua Taat.

5. Conclusion

This study is a response to the growing body of knowledge by inspiring and understanding the potential of ethno-tourism at Gua Bewah, Tasik Kenyir through the historical and cultural exploration. More studies, publicity and program development are required to market and promote the uniqueness of the hidden national historic heritage that reside in Gua Bewah. In addition, the usage of ethno-tourism should be a clear understanding of the communities because ethno-tourism should be seen as an alternative of our country's tourism to boost the local economy as well as increase the awareness and environmental

Acknowledgements

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KENYIR LAKE: ECOTOURISM AND THREATS TO ITS DEVELOPMENT

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ABSTRACT

Ecotourism is often perceived as a tool for promoting sustainable management of the country's natural resources whilst providing social and economic benefits. As a concept, it gains support mainly for its contribution to environmental conservation, cultural preservation and economic values. Kenyir Lake and its surrounding rainforest is home to a rich diversity of species and supports a community of indigenous people, the Orang Asli, who depend heavily on the region's natural products and ecosystem services. However, uncontrolled tourism, excessive logging and poaching, overlapping policies and management issues are some of the factors that could potentially harm the area and diminish Lake Kenyir as a potential sustainable ecotourism destination. This paper highlights some of these threats and provides recommendations for the management of natural resources for long term sustenance of its biodiversity.

Keywords: Ecotourism, Kenyir Lake, Orang Asli, sustainability and biodiversity.

1. Introduction

Ecotourism is a sustainable natural resource-based tourism activity that principally promotes conservation whilst stimulating economic growth. It focuses primarily on encouraging tourists to experience and learn about nature and its natural resources; without disturbing the ecosystems and the services they provide. At the same time, it also promotes conservation and provide economic benefits to local communities (Ceballos-Lascurin, 1993). This nature-based tourism relies heavily on its natural resources and heritage to attract tourists to areas that are commonly remote and with limited income opportunities for its residents. Despite its apparent benefits, this form of tourism has not been without controversies (Orams, 2002). The presence of humans in natural area is often viewed with inherent negative impacts. Many argue that exclusion and protection of natural areas is the best form of conservation and protection to a fragile and threaten ecosystem (David et al., 2002). However, the impacts of human presence on animals are difficult to ascertain as it is often subtle and complex (Rode et al., 2007; Vignon et al., 2010). Hence, whether ecotourism contributes to species and habitat protection is still subjected to discussion (Duffus & Dearden, 1990; King & Stewart, 1996).

Malaysia is blessed with vast amount of natural resources, rich biodiversity, beautiful landscapes, ecosystems and culture. There are approximately 298 species of non-marine mammals (Davison & Akbar, 2007), 742 species of birds (Jeyarajasingan, 2007), 203 species of amphibian and 397 species of reptiles (Das & Yaakob, 2007), 280 species of freshwater fishes in Peninsular Malaysia and more than 100 and 200 species reported from Sabah and Sarawak (Ahmad & Khairul Adha, 2007), 1751 of marine and brackish water fishes (Arshad & Padilah, 2007), over 102 species of freshwater crabs (Ng & Yeo, 2007), 4000 species of larger moths and 936 species of butterfly (Khen, 2007), 1200 ant species (Idris, 2007), 386 species of Seaweed (Phang et al., 2007), and 15000 species of vascular plant (Saw & Chung, 2007). These numbers are considered to be rough estimates as there are many species yet to be discovered and the systematics of many groups remain unresolved. Hence, Malaysia is recognized as one of the megadiverse countries alongside 11 more countries where together they embrace about 60% of the world's known species (Mohamed, 2005).

Kenyir Lake is in Terengganu that is situated on the east coast of peninsular Malaysia. The lake was formed by the damming of several rivers over the period 1978 to 1985 to create the Sultan Mahmud Hydro Electric Power Plant which covers an area of 36,900 hectares. Kenyir Lake, and its surrounding area, is home to numerous species of flora and fauna, and the area is touted as a centre for cultural tourism, ethnic tourism, environmental tourism, and recreational tourism. It has an estimated of 132 dipterocarp tree species, 290 species of birds and 61 recorded species of fish (Walton et al., 2016). Kenyir's diverse natural resources are also heavily relied on by the indigenous people; the Orang

Asli. The biodiversity of the area provides sustenance and livelihoods for the Orang Asli (Ramle et al., 2014). Hence, factors that impact local natural resources such as tourism may have direct implication to the sustainability of the Orang Asli's way of life. Uncontrolled tourism, excessive logging and overlapping policies are among the factors that could potentially harm the sustainability of the Kenyir Lake area and reduce the quality of life for the Orang Asli. This paper highlights threats to Kenyir's ecotourism industry and provides recommendations for its sustainable development.

2. Threats to Kenyir Lake

2.1. Logging and Poaching

Malaysia is listed in the International Tropical Timber Organisation (ITTO) as one of the five major tropical log producers between 2012 to 2014 (Figure 1). High quality and sought after timbers are produced like Cengal, *Neobalanocarpus heimii*, Dark Red Meranti, *Shorea acuminata* and also Agarwood, *Aquilaria malaccensis.* The latter is commonly used as incense, perfume and in traditional medicine and its value has increased due to a recent increase in demand from consumers in the Middle East (Marina et al., 2010). With the total export value of more than 20 billion of timber products in 2014 (Figure 2), timber products utilization becomes a major threat to the forests around Kenyir Lake.

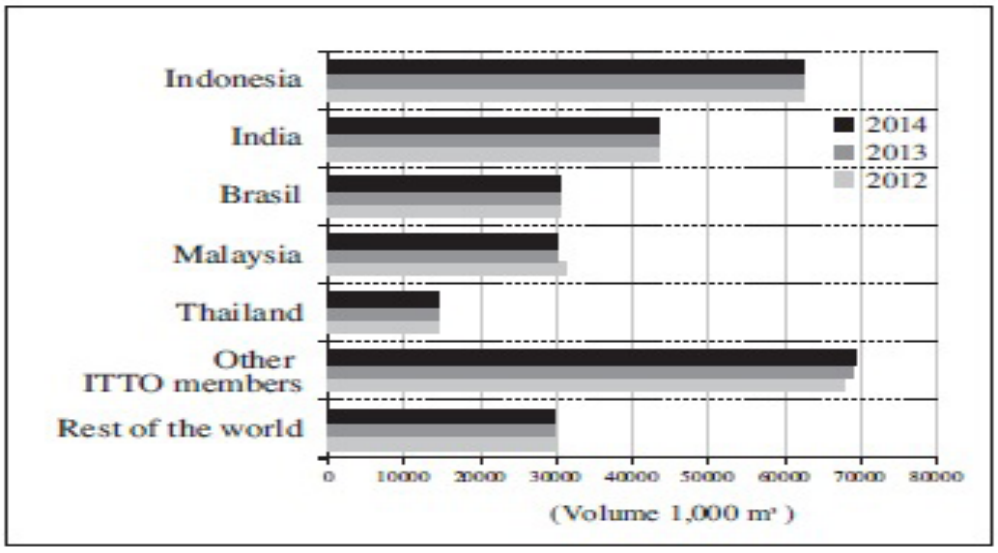

Figure 1 Major Tropical Log Producers
Source: ITTO, 2014

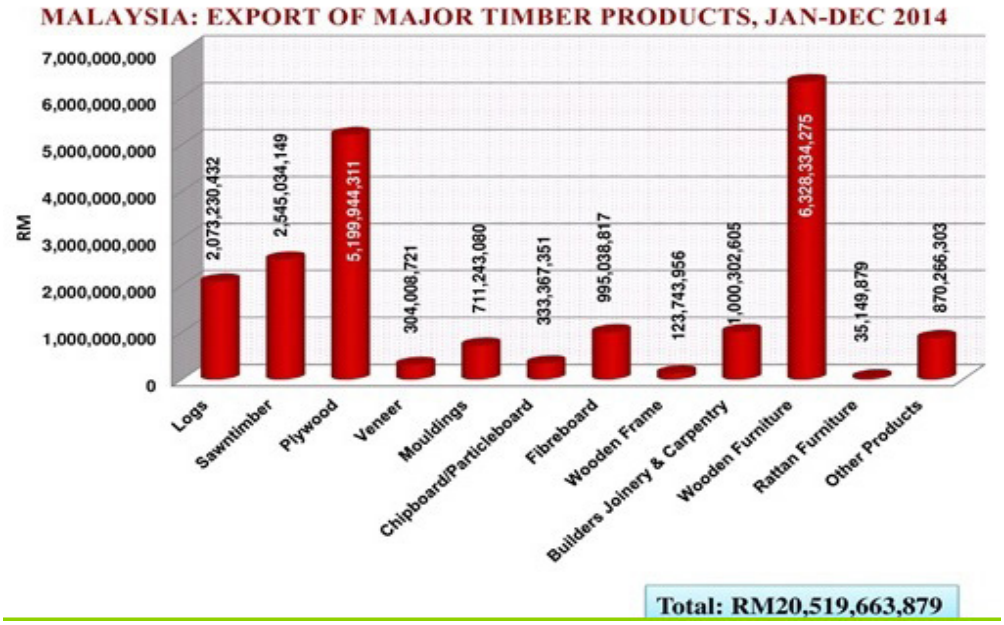

Figure 2 Export of Major Timber Products
Malaysian Timber Council, 2014

Although a proposal to gazette the Kenyir area as a UNESCO Geopark is currently being considered (Tan, 2014), the area is not yet protected, with the exception of Tanjung Mentong which is considered as part of the bordering National Park, thus legal logging activities are permitted. Legal logging activities in the area which is intended to finance the state government appears to be sustainable. However, it has nevertheless lead to deforestation, landscape changes and fragmentation of the forest in some places. The high price of agarwood, *Aquilaria malaccensis* encourages poachers to illegally collect this particular timber species (Chua 2008). Illegal logging of agarwood conducted by poachers not only threatens the trees they harvested but the sale of this wood is thought to facilitate and subsidise wildlife poaching activities (Reuben clements pers. comm.). Logging can reduce the quality of aquatic habitats as well as terrestrial habitats. River and lake water quality is decreased by an influx of suspended sediment washed from cleared, destabilised land increasing turbidity and smothering fish spawning gravels (Karim & Mansor, 2013). Without doubt, tourism activities like recreational fishing and local subsistence fishing will be affected if fish populations in Kenyir Lake are reduced. More directly, the Orang Asli will be affected by a decline in forest products. The forest has been a vital source of sustenance to the local residents. The Semaq Beri tribe (within the Orang Asli) regard the forest as a 'Forest Bank', in which their sources of livelihood are safely stored (Ramle et al., 2014). Ramle et al., (2014) categorized the significant resources in the context of food and income into five categories (Table 1).

Table 1 Categories of food and income sources from the forest of Semaq Beri tribe

No.	Category	Food/ Income
1	Source of carbohydrate	Wild tubers (In many varieties. There are at least 10 types of wild tubers that are often consumed by the Semaq Beri tribe as a source of food (Ramle, 1993).
2	Source of vegetables	Consists of fern shoots and wild vegetables (*umbuk*). There are at least five types of *umbuk* consumed by the local residents.
3	Source of protein	Consists of wild game meat and fishes. All animals and fishes can be consumed except those considered poisonous.
4	Source of fruits	All types of fruits, except those considered poisonous.
5	Source of income	Various materials that have market value. The Semaq Beri usually focuses on searching rattan, aloeswood, some wild game catches and medicine (herbs).

Source: (Ramle et al., 2014)

There are more than 800 species of medicinal and aromatic plants recorded in Peninsular Malaysia that are used by indigenous tribes (Ministry of Natural Resources and Environment, 2014). The Malayan Tiger, *Panthera tigris jacksoni* has been hunted for centuries due to its value in Chinese medicine. Nowell and Link (2007) stated that tiger was used to produce "Bone Strengthening Wine" and sold for USD$120 a bottle. The decline in the number of these majestic creatures from an estimated of 3000 (Locke, 1954) to 500 (Topani, 1990) have been worrisome . Tiger surveys at nine forest sites in the states of Perak, Pahang, Terengganu and Kelantan between 1997 and 1999 reveals that tigers were confirmed from six sites and suggests their national population up to several hundred tigers with density of 0.51 – 1.95 tigers per 100km^2 (Anthony et al., 2007). On the other hand, Pangolin, *Manis javanica* is also hunted as a source of protein, leather goods and traditional medicine (CITES, 2000) while Asian elephant, *Elephas maximus* are poached for meat, leather and for ivory (Hedges, 2006). Such species represent charismatic mega fauna that add value to the Kenyir area as an ecotourism resource as the chance to see them in the wild has tangible value to consumers. The survey by UNWTO (2014) confirms that wildlife watching is the dominant factor in tourism for most African countries, representing 80% of the total annual trip sales to Africa. The data also suggests that tourists are willing to pay up to USD$433 per person a day (UNWTO, 2014). It therefore a reduction in the numbers of these animals through poaching could reduce the perceived chance of seeing one thus decreasing ecotourists' willingness to pay.

Hence, these activities are major threats to the pristine forest ecosystem, culture and majestic animals in the lake area and promoting the area for tourist attractions.

2.2. Uncontrolled Tourism

In the last 5 years, approximately more than 20 thousand of tourists were attracted to visit the Kenyir area to be involved in activities such as fishing, sight-seeing, camping, bird watching and jungle trekking and this figure keeps increasing each year (Figure 3). The lake harbours 14 waterfalls flowing rapidly around the lake with the most famous being the Lasir waterfall and limestone cave like the Bewah Cave and Taat Cave. Kenyir Lake is also a popular destination for recreational fishing. However, uncontrolled tourism and fishing activities could degrade historical sites, the fish and its habitats, effecting the development of Kenyir Lake as an ecotourism attraction. Without proper monitoring by the authorities, the value of its attractions could be decreased. According to Zwirn et al. (2005), recreational and sport fishing could actually lead to overexploitation, similar to legal commercial fishing if performed and managed recklessly. This evident is seen in United States as 23% of recreational fishing often involves the catching of endangered species (Coleman et al., 2004). Recreational fishing has the potential to aid the introduction and establishment of alien fish species in Malaysia as desirable sport fish are often stocked to create new fishing opportunities (Khairul Adha et al., 2013; Walton et al., 2016). For example, the peacock bass, *Chicla ocellaris* in Peninsular Malaysia were introduced by irresponsible anglers in the early 1990s into the man-made lake from former mining area for sport fisheries (Khairul Adha, 2006).

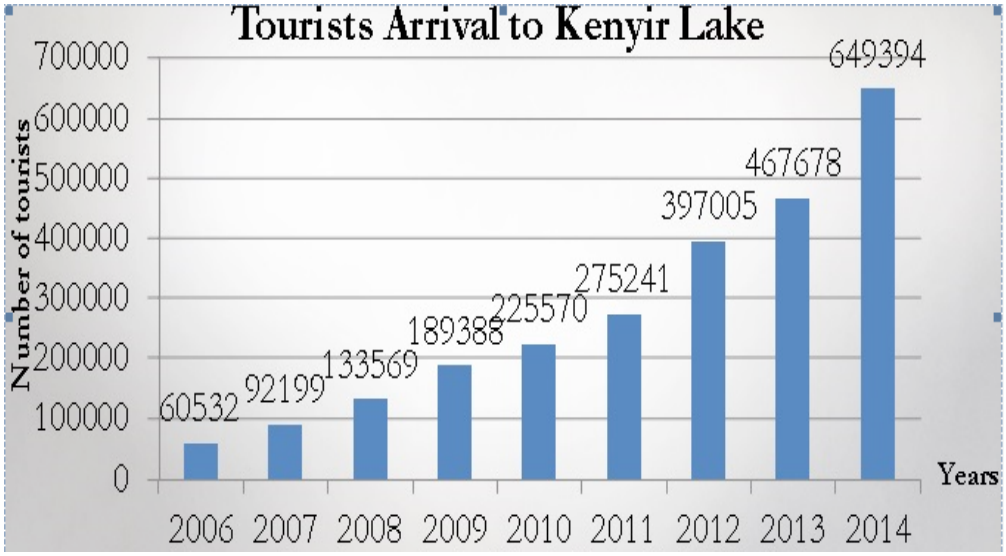

Figure 3 Tourist Arrival to Kenyir Lake
Source: KETENGAH, 2011; Faizah et al., 2015)

It is important to maintain the indigenous knowledge and the Orang Asli sustainable practices as it can be promoted as an attraction in the Kenyir Lake area. However, increasing contact between indigenous people and tourists have threaten to erode their traditional way of life. In the short term, tourism can improve the economic status of the Orang Asli. However, Tzu-Ming and Dau-Jye (2014) suggested that new modes of economic revenue accompanied by tourism activities may change the traditional social mechanisms of aboriginal tribes. Merlan (1998) found that the indigenous people's natural resources use methods change due to tourist's interference with their traditional beliefs. Although Islam has been spreading into the Semaq Beri community in Kenyir since 1994, there is no real change in their way of life as they still practise their ancestors' belief (Mohd Zahedi et al., 2007). On the other hand, the increasing number of tourists may lead them to rely on tourism-based jobs like tour-guides and boatmen thus changing their traditional lifestyle. These changes may lead to the loss of traditional knowledge and degradation of culture.

2.3. Management Issues

In 1996, Kenyir Lake was listed as one of the potential sites for ecotourism in the Malaysian National Ecotourism Plan (MOCAT, 1996) and has stated that the entire area is under the jurisdiction of Terengganu Tengah Development Authority, KETENGAH which lead the development plan with the help of consultants. However, this may be delaying the gazettement of Forest Reserves and may be hindering ecotourism (MOCAT, 1996). In addition, there is some confusion and overlapping management authority in dealing with the historical sites like Bewah Cave and Taat Cave as it could fall under the jurisdiction of the Department of Wildlife and National Park, Terengganu Tengah Development Authority, KETENGAH and also Terengganu State Museum. Also, there are no specific Federal laws or rules related to lake management even though there are numerous Federal and State laws related to river management like the Environmental Quality Act (EQA), Town and Country Planning Act (TCPA) and Water Services Commission Act (WSCA) and the Water Services Industry Act (WSIA) (Academy of Science Malaysia, 2009). According to Academy of Sciences Malaysia (2009), there is no dedicated organisation that looks at lake management separately as Department of Irrigation and Drainage (DID) does not have a mandate for lake management. Zati and Salmah (2008) discussed the need to revise and improve the water and environmental laws for lake development and management. Generally, there are inadequate governance system to monitor and manage lake ecosystem in Malaysia. Hence, there is a need to formulate a special law for lake ecosystem.

2.4. Biological Threats

The establishment of new fish species intended for aquaculture, biological control, the aquarium industry and stock enhancement has led to the spread of invasive alien species in Malaysia (Reusink, 2005; Walton et al., 2016). Khairul Adha et al., (2013) discussed that alien species can tolerate wide range of environmental condition and humans are the main sources for the spread and translocation through aquaculture and stock enhancement throughout Malaysia and establish in wild. This alien species could have a negative impact on native ecosystems and should have been prevented at all cost. Walton et al., (2016) reported that *Gambussia affinis* which may be introduced to control mosquito-borne diseases (Ghosh & Dash, 2007) as a means to reduce the proliferation of Dengue fever in recent years (Lavinia, 2015) poses a threat to Kenyir's native species population viability through tropic competition, interference competition or by predation on other fish. Direct predation on the eggs and young individuals of important native species like Tinfoil barb, *Barbonymus schwanenfeldii* and Hampala barb, *Hampala macrolepidota* may affect commercial harvest in the future and availability for sport fishing.

2.5. Other Threat

The creation of the Sultan Mahmud Hydro Electric Power Plant which later created Kenyir Lake may give negative impacts on local community. In addition to the creation of the new dam in the upper stream of Sungai Terengganu which intended to increase and improve electricity output (The Star, 2010), fish species may significantly decrease and affect the native species. Karim and Mansor (2013) reported that about 40% of fish's availability and species diversity is reduced due to the affect of the dam in the Temenggor Lake area. The native species in Kenyir Lake may be affected and reduce in numbers. The prestige of Kenyir Lake as angler's heaven could be damaged and lead to loss of tourists and profits.

3. Conclusions and Recommendations

As tourism in Kenyir Lake depends on its flora and fauna and also the indigenous cultural heritage, the following recommendations relating to logging, poaching and uncontrolled tourism could improve the status of Kenyir Lake area as ecotourism destination.

Firstly, to prevent further degradation of forest resources, the whole forest area of Kenyir Lake should be gazetted as a National Park or State Park and be given full protection. The gazettement of the forest around Lake Kenyir could prevent more logging activities and reduce poaching in the areas. The declaration of Royal Belum in Perak as a state park should be used as an example to preserve Kenyir' precious natural resources. Restricting access for poachers and illegal loggers, providing regular patrols and strict enforcement is critical to the preservation of the regions' endangered wildlife. Authorities could restrict access for fishing in the lake, designating areas deemed to be important for the reproduction of exploited fish species as off limits, or activities restricted at certain times of year, during spawning times for example. Tourists that visit the lake for fishing should be notified about these limits and rules should be actively monitored and enforced by patrolers. Monitoring of wildlife and fish populations will assist park managers to assess the risks posed by poaching and fishing, optimising wildlife protection through informed decision making.

The knowledge and practices of indigenous people are important to ensure the sustainability of forests. There is a need to record and explore more of this knowledge as there are insufficient research on the Semaq Beri tribe in Terengganu. In contrast, increasing contact between indigenous people should be limited to decrease interference of other cultures.

Recreational fishing can be sustainable if practiced responsibly. The success of lake trout fisheries in New Zealand utilising catch and release methods make it a good model for the fishing practices in Kenyir. However, the effectiveness and impacts of such angling practices should be monitored and studied to ensure its benefits outweigh the costs (Young, 1999).

The overlap of Federal and State jurisdictions should be a major concern and lead to an understanding and creation of a new policies and organisation to monitor and manage lake systems in Malaysia. Aquaculture industries are important in Malaysia for food production and have the potential to reduce fishing pressure on wild stocks; however the introduction of non-native invasive fish species should be strictly controlled to avoid negative environmental impacts.

The commercialisation of aquaculture of native fish species should be developed to relieve pressure on wild stocks and prevent further introduction of invasive species from aquaculture. Lastly, the documentation of fishes in the affected area of the dam should be done and sensitive fish species should be subjected to breeding programs.

Overall, ecotourism in Kenyir has great potential to be recognised at an international level, but numerous challenges must be addressed. Its potential as an ecotourism destination largely depends on natural resources and heritage. Thus, steps must be taken in order to maintain the area's natural condition. Threats to ecotourism development like logging and poaching, uncontrolled tourism, overlapping policies and management issues should be monitored and their impacts reduced where possible. Ultimately cooperation between stakeholders and authorities will be crucial in the development of the area and its promotion as a premium destination to the public. Enforcement of law must be revised to preserve the natural heritage of the area.

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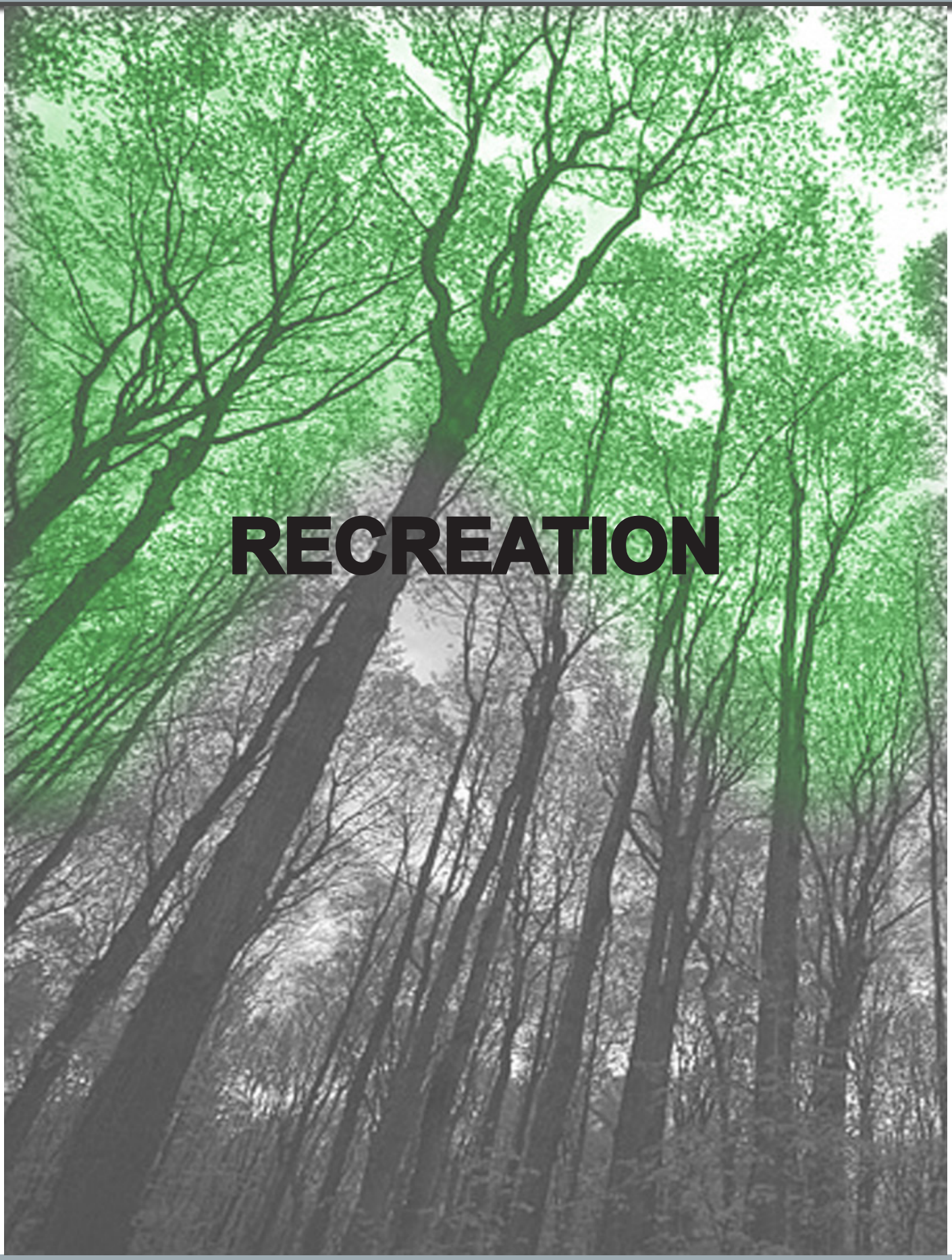
RECREATION

A PRELIMINARY STUDY ON EFFECTS OF TEMPORAL CLOSURE ON SOIL COMPACTION AND TRAIL WIDTH AT FOREST RESEARCH INSTITUTE MALAYSIA

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ABSTRACT

Closing excessively used nature trails is one of the methods to reduce recreational impact. A preliminary observation on nature trail's recuperation was carried out at Forest Research Institute Malaysia's canopy walkway trail. Soil bulk density and trail width were monitored from January 2014 till June 2015. Soil bulk density and trail width were found to have decreased by 4.32% and 17.5%, respectively. This study showed that temporal closure of the nature trail enhanced the soil quality. The results of this study will be used as a guidance for the management to estimate period of trail closing.

Keyword: Ecotourism, forest recreation, hiking, nature trail management and carrying capacity.

1. Introduction

Ecotourism refers to the responsible travel to natural areas that conserves the environment and improves the well-being of local people (TIES, 1990). Ecotourism industry is now the second most important economic resources of Malaysia. Other than the urban and historical attractions, forested areas are also favourite places of visit.

The grounds of Forest Research Institute of Malaysia (FRIM) were partly abandoned mining areas and vegetable farms, but was reforested starting in 1928. The grounds have now become one of the most popular destinations for recreation activities among locals and foreigners. For recreational purpose, FRIM offers a wide spectrum of activities such as hiking, trekking, picnicking, jogging, camping and bird watching. These activities are in demand due to the increased awareness among the public on the importance of healthy lifestyle. Table 1 shows the number of users entering FRIM's ground for various recreational activities.

However, uncontrolled recreational activities can cause negative impacts to the forest ecosystem. Previous studies proved that recreational activities gave negative impacts on the forest ecology. In addition, various ecological components are inter-related, thus recreation impact on a single ecological element will eventually affects the other components (Hammitt & Cole, 1998). Excessive visitors not only degrade the environment but also reduce the recreational satisfaction among the users (Noor Azlin, 1999).

The type and extent of trail impacts are influenced by use-related and environmental factors, both of which may be modified through management actions (Marion & Olive, 2006). Use-related factors include type of use, amount of use, and user behavior while the environmental factors include vegetation and soil types, topography and local climate (Leung & Marion, 1996; Hammitt & Cole, 1998; Marion, 1998).

Outdoor recreation, including nature-based tourism, has long been recognized as an agent of ecological change in natural ecosystems, with the potential to affect soil, vegetation, wildlife, and water quality (Leung & Marion, 2000; Monz et al., 2010). Hence, proper monitoring of nature trail is important to ensure sustainability of the forest ecosystem while monitoring the user satisfaction. This study was conducted to evaluate the recuperation progress of a nature trail in FRIM. This study is important to assist the management in determining the needs to re-open a new trail and close existing trails for the purpose of recuperation.

Table 1 Number of FRIM recreational users from 2006 till 2015

Year	Number of users
2006	170,373
2007	190,931
2008	212,105
2009	255,663
2010	193,012
2011	296,159
2012	683,946
2013	707,297
2014	1,090,159
2015	542,509

2. Materials and Methods

The study was conducted at FRIM's canopy walkway trail. The trail leading to the canopy walkway is also used for trekking purposes since 1991. The canopy walkway of FRIM is one of the major ecotourism attractions. This trail (930 m) has been closed since December 2013 due to the condition of highly compacted soil (Figure 1).

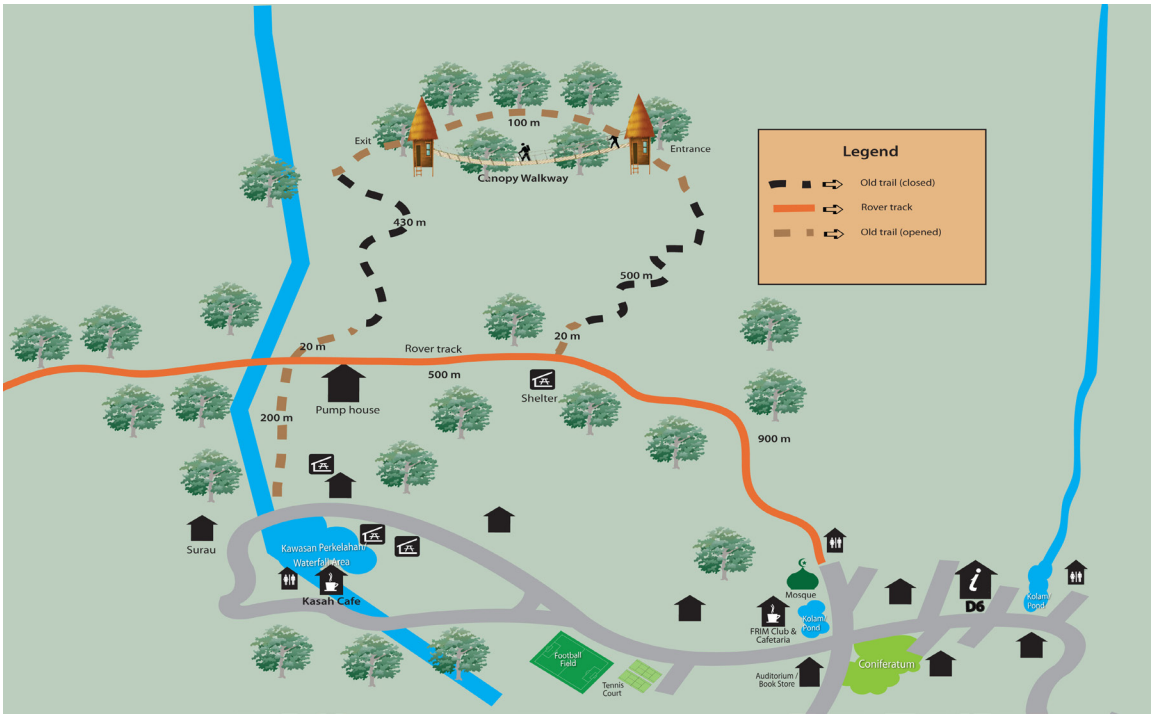

Figure 1 FRIM's Canopy Walkway trail
Source: Forest Research Institute Malaysia

Two types of data were recorded i.e., soil bulk density, BD (g/cm^3) and trail width, TW (cm). Data on TW and BD were recorded at two-month intervals. A total of 90 soil samples were taken from the trail for BD measurement. The soil samples were taken at the middle of the trail and 10 m from one another. All soil samples were sent to the laboratory for further analysis. In the laboratory, the weight of each soil sample was recorded. The samples were then oven-dried at 105 ^oC for 24 hours and re-weighed. BD was calculated by using the formula below:

$$BD = \frac{\text{Soil weight before oven-dried – soil weight after oven-dried (g)}}{\text{Soil volume (cm}^3\text{)}}$$

For TW, measurement was carried out by using a measuring tape at each sampling point at the middle of the trail. The study period was from January 2014 till June 2015.

3. Result and Discussion

The study found that the trail has BD of 1.62 g/cm^3 in January 2014. In June 2015, the BD was reduced to 1.55 g/cm^3 after the trail was closed for 18 months, showing a reduction of about 4.32% (Figure 2). In general, the greater the BD, lesser pore space would be available for water movement in the soil. This condition will hinder root growth and penetration, seedling germination and subsequent plant growth. Previous studies showed that shoot growth and leaf size is declined when BD increases (Masle, 1992; Mulholland et al., 1999).

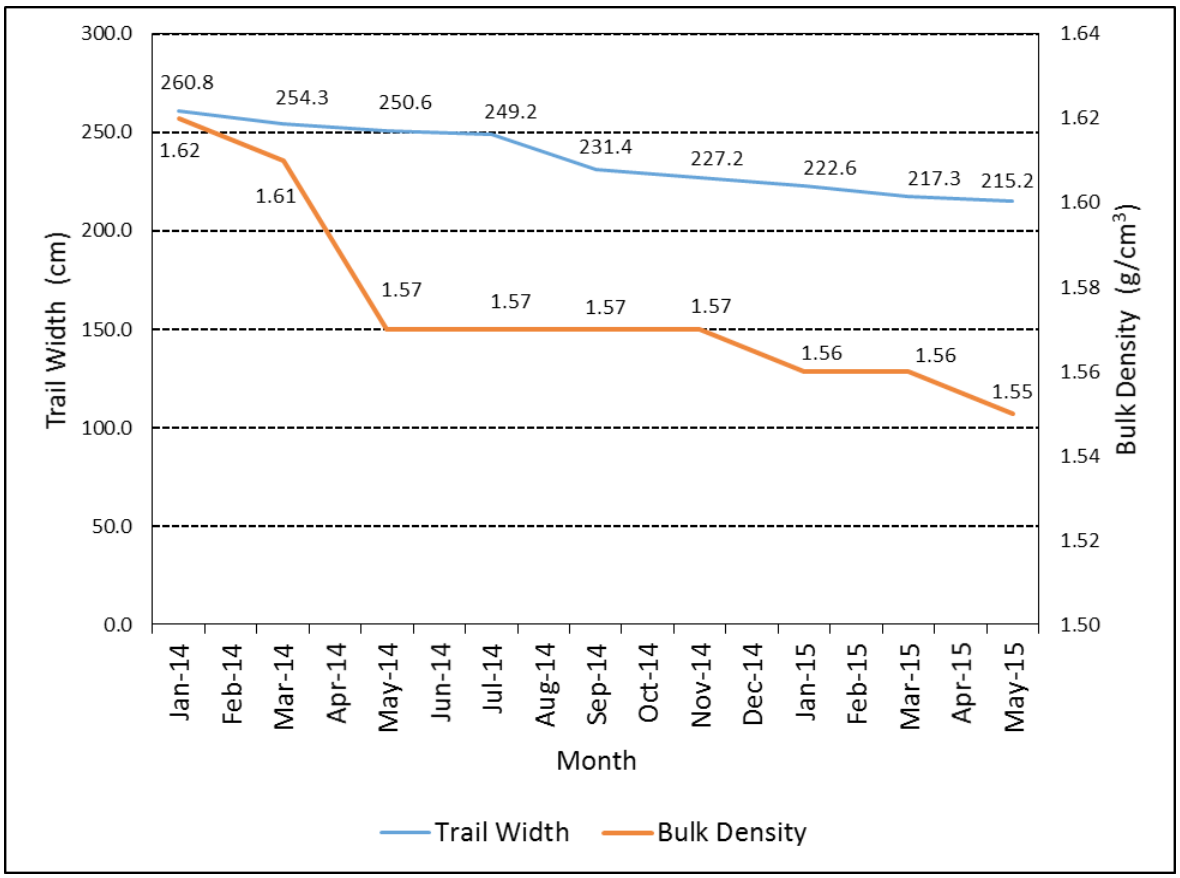

Figure 2 Soil bulk density and trail width (January 2014 till June 2015)

The TW of the trail was reduced from 260.8 cm to 215.2 cm, a reduction by 17.5%. These results suggested that temporal closure of the trail reduces compacted areas hence allowing for new plant growth.

4. Conclusion

The findings of this study confirm that temporal closing is a practical approach to minimize the impacts of recreational activities on soil compaction and trail widening in forest areas.

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THE DEVELOPMENT OF CREATIVE INDUSTRIES IN MALAYSIA AS EXPERIENCED BY LES'COPAQUE PRODUCTION

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ABSTRACT

The 21st century has been known as an era where countries need to find new economic activities. With the rapid evolution of ICT today, it has brought profound worldwide changes to human lifestyle. Many scholars agree that the creative industries are significantly connected to the cultural aspects particularly in developing countries like Malaysia. At the same time, culture and tourism have always been closely related to each other. Hence, in order to compete in the creative industries world market, developing countries like Malaysia have to work together with traditional industries such as the cultural and tourism industries because they have unique and rich cultural resources. A case study was conducted with an animation company in Malaysia to better understand their experiences in developing animation products that adopted the Malaysian culture. Face to face interviews with key officials of the company were undertaken to gather an in-depth data on their experiences. Secondary data was also used to support the primary findings. The company made a substantial breakthrough in the international market particularly in Asia with their animation products that infused strong Malaysian culture. The combination of the two industries was suggested as creative tourism. The combination of multidisciplines are highly recommended for developing countries like Malaysia to further enhance the two industries. Nevertheless, there are many aspects that still need major attention from the stakeholders in Malaysia for the development of both industries.

Keywords: Creative industries, culture, tourism and Malaysia.

1. Background to Creative Industries

The 21st century has been acknowledged as an era where countries need to find new economic activities. With the rapid evolution of information, communication and technology (ICT) at the present time, it has brought profound worldwide changes to our lifestyles. Unfortunately, not all countries have equal ICT growth and facilities. In addition, there seems to be no common definition of creative industry in the literatures, even today. But scholars do agree that creative industries are significant elements of the creative economy notion (UNCTAD, 2008).

1.1. The History of Creative Industries in Malaysia

Malaysia has been constantly mentioned in the literatures pertaining to the development of creative industries in the developing nations (UNCTAD, 2008). Malaysia has been identified as one of the most important developing countries due to its economic and political stability. However, Malaysia is still trying to catch up with her neighbours (such as Hong Kong, Indonesia, India, Singapore and Vietnam) and other developed countries which are more advanced in this sector. Compared to other important traditional economy sectors in Malaysia such as agriculture, tourism and manufacturing, the creative industry is a new term and therefore the government and public sector still lack understanding of it, particularly its definition (Ali et. al., 2011).

For the last 20 years, Malaysia has shifted to a technology based economy. With Vision 2020 (of which ICT development plays a large part) being initiated to achieve a 'developed nation' status by the year 2020 (Ramasamy et al., 2004), it has given significant impact on the growth of creative industries in the country. Some authors have described the Malaysia's ICT plan as one of the most aggressive in the world, with it receiving full support from the government (Ratnathicam, 2002) as well as being ambitious. Malaysia's ICT plan has seen the birth of many government agencies and private organisations focusing on expediting the growth of creative industries in the country. The establishment of the Multimedia Development Corporation (MDeC) in 1996 by the government is a proactive step taken to bring Malaysia to the next level in the development of the creative industries. One private company that made a substantial impact on the development of ICT in Malaysia is the Les'Copaque Production (LCP) that utilized the cultural elements in the production of their animation products.

The United Nations Conference on Trade and Development (UNCTAD) (2004; 2008; p 12-13) formulated and broadly classified creative industries into four areas: (1) heritage – traditional cultural expressions and cultural sites; (2) arts – visual and performing arts; (3) media (not including new media) – publishing and printed media and audiovisuals; and (4) functional creations – design, new media and creative services.

Since the classification combines culture, tourism and creative industries together, the present classification is used as a guideline in this study to explore the creative sectors in developing countries particularly in Malaysia. The creative industry comprises a whole range of often overlapping organisations, products and disciplines (Cunningham, 2002), such as art, culture and entertainment. It shows the close connection between the three sectors particularly in developing nations which tend to include culture and heritage as part of their creative industry definition. It is noted that many research based on developed countries have omitted cultural tourism (such as heritage tourism) from being a part of their creative industry (Cunningham, 2002). Developing nations may not have the creativity, innovation and technology resources offered in the developed countries; nevertheless their lacking in the former is compensated by the abundance of rich cultural resources which can be used as a platform to develop their creative industry and to compete with the developed countries (UNCTAD, 2008). While it seems self evident that culture, tourism and creative industries are inter-connected, research examining their relationship is rare. Developed countries like Australia and New Zealand have adopted the creative industries model introduced by the UK labour government in 1998. However, developing countries such as China, Indonesia and Malaysia use mixed model, a combination between the UK model and their own model. For example, in these three countries, culture and part of tourism (such as arts, crafts and heritage) are part of the creative industries development plan.

1.2. Research Problem

The central research problem of this study is to explore the development issues underlying the creative industries through the development of the animation sector as experienced by LCP in Malaysia. Hence, three research questions have been formulated for this research:

RQ1: What is the relationship between cultural tourism and the creative industries?
RQ2: How is the animation sector in Malaysia being developed?
RQ3: How does Malaysia position itself in the creative industries in the region?

In order to answer the three research questions, a case study on a company that has been directly involved in the creative industries and utilizes the Malaysian culture in their products was used. The next section will discuss more on the company.

2. Review of Related Literature

Many scholars in the literature believed that culture is connected to all aspects of human life (Smith, 2001). Hence, when the topic of creative industries is discussed in the literature, it will be associated to culture. This is similar to the tourism industry because they rely significantly on culture (McKercher & du Cros, 2002). According to the World Tourism Organisation (2004), cultural tourism has always been the top three reasons for people to travel in the yesteryears and it remains to do so until today.

Cultural tourism activities are the combination of the cultural and tourism sectors. Both have established a close connection to each other since the days of the Romans (McKercher & du Cros, 2002). However, the phrase 'cultural tourism' was not used until 1992 (Stebbins, 1996). The White House Conference on Travel and Tourism defined cultural tourism as "travel directed toward experiencing the arts, heritage and special character of a place" (as cited by Heritage Tourism National Trust, 2002). From this definition, the key idea on cultural tourism is about 'experiencing' the products. The World Tourism Organisation (2004) defined cultural tourism as; the movement of persons for essentially cultural motivations (study tours, performing arts, and cultural tours), travel to festivals and other related events. Although in WTO's earlier definition of cultural tourism did not mention about experience, nevertheless, study tour which means the tour taken with the intention to learn something was mentioned. From the learning activities, it provides knowledge and experience to a person. In addition, due to the rapid changes taking place around the world, more authors seem to include experience in their definition of cultural tourism.

Cultural tourism has been identified as the major contributor to the tourism industry for more than twenty years, and it has played an important role to many developing nations' economy (WTO, 2004). UNCTAD (2008) identified the rich cultural resources in the developing countries which can be used as their creative asset to develop the creative industry. Using these resources will enable developing countries create their own unique cultural identities which can be exported globally with the objective of reaping economic and social benefits and increased participation in the global economy (UNCTAD, 2008). Hence, many governments worldwide are now promoting their cultural tourism assets due to its immense potential contribution to their socio-economy (Heritage Tourism National Trust, 2002). Seemingly, over the past two decades the tourism industry is becoming stiffly competitive, and thus compel countries to be both creative and innovative in the use of technology in their development and promotion of their cultural and tourism products (Richards & Wilson, 2006). It is from this premise that stakeholders within both the cultural tourism and creative industries are now in dialogue with one another to develop a unique place-based product.

Currently, cultural tourism products like arts, handicrafts, and traditional music are becoming more innovative and creative to remain competitive. Unfortunately, a substantial gap still exists in the academic literature on this topic predominantly relating to the policies of cultural tourism and creative industries in the developing nations. Some research works have attempted to marry aspects of cultural tourism and creative industries which consequently lead to the conceptualization of the term "creative tourism", which was first introduced by Richards and Raymond (2000). However, further clarification is needed to better understand this new concept and the relationship between the two core elements contributing to it.

2.1. Creative tourism

These days, tourists expect delightful and memorable first hand experiences in consuming tourism products. Hence, the tourism sector needs to beef up their product offerings and ensure that they inject some creative elements to keep their products competitive and sustainable (Richards & Wilson, 2006). Smith (2001) also pointed out that many countries have limited heritage attractions to develop or promote. Therefore, the focus on contemporary, experiential and creative tourism becomes of pivotal importance. Richards and Wilson (2006) came up with the term "creative tourism" which is illustrated in Table 2.1 to demonstrate the relationship between cultural and creative forms of tourism. Further attempt was made by Richards and Raymond (2000) in defining creative tourism as: "tourism which offers visitors the opportunity to develop their creative potential through active participation in courses and learning experiences which are characteristic of the holiday destination where they are undertaken" (p.18). Creative tourism concept is thus seen as the answer to sustain the competitiveness of cultural tourism products in the market. Table 1 shows that, creative tourism is the result of creative processes from the past, present and future where the combination of cultural tourism and creative industries exist side by side.

Table 1 The relationship between cultural and creative forms of tourism

	Primary time focus	**Primary cultural focus**	**Primary consumption focus**	**Primary learning focus**
Cultural tourism	Past and present	High culture, popular culture	Product, process	Passive
Creative spectacles	Present	Arts, performance	Performance	Passive
Creative spaces	Present and future	Arts, architecture, design	Atmosphere	Interactive
Creative tourism	**Past, present, future**	**Creative process**	**Experience, co-makership**	**Active skill development**

Source: Richards and Wilson (2006).

However, it is not the main scope of this study to discuss in detail on this new terminology, It is only meant to mention creative tourism as a new term introduced in the field of tourism and to show the close relationship between creativity and tourism. Unfortunately, not many research works have been conducted to further examine this term.

2.2. Creative industries in relation to cultural industries

The creative industries have been acknowledged to have various players that mostly belong to the cultural and service industries (Hartley, 2005; UNCTAD, 2008). This has created a long debate on the overlapping claims made by these sectors. Heated arguments persist between cultural and creative industries theorists. Some cultural theorists argued that creative industry is exploiting cultural products for commercialisation purposes (O'Connor, 2007), while there are others that claim cultural products are part of creative industry (Hartley, 2005). Yudice (2003) cautioned that even though culture is a resource, it should be treated more than just a commodity. By giving Brazil as an example he continued to state that culture is seen to be able to reduce social conflicts and is capable of leading economic development for the community in the slum areas. For the purpose of this study, the cultural definition used by many anthropologists will be used. They explained culture as an interpretation that is more value-neutral and analytic; and can be found everywhere and not only in the high arts or Western "civilisation" (Smith, 2001). Since the central focus of this study is on the developing nations particularly in Malaysia, this broad idea of culture is suitable in the current study.

2.3. Creative industries in relation to experience industries

The most cited definition used in the literature for creative industries is the definition by the Department for Culture, Media, and Sport (DCMS), UK (2001). They defined creative industries as "those industries that are based on individual creativity, skill and talent. They are also those that have the potential of creating wealth and jobs by developing intellectual property". The creative industries include advertising, architecture, art and antique markets, designer fashion, film and video, music, and software (DCMS, 2001). Almost on the same note, the Sweden Knowledge Foundation cited in Nielsen (2004) defined experience industry as "a collective term used to describe people and businesses in the creative professions whose main purpose is to create and/or supply experiences in various forms". It has 13 sub-categories which include; architecture, design, film/photography, visual arts, literature, advertising, media, fashion, music culinary arts and meals, performing arts, tourism and experiential learning. The two definitions of creative and experience industries have close similarities except for the sub-categories under them. In the creative industries definition, only a part of the cultural products are considered as core products while the rest are grouped with tourism and are categorised as related areas. On the other hand, the experience industry culture and tourism are considered to be the core areas. To some extent, perhaps the experience industries are more suitable for the developing countries which normally categorised their culture and tourism activities as part of their creative industries.

The concept of experience is rather new although it is not a new phenomenon (Darmer & Sundbo, 2008). Activities such as leisure, tourism, cultural, marketing, and internet are part of the experience industry because they offer real services, goods or commodities to customers that command a fee (Pine & Gilmore. 1998). According to Pine and Gilmore (1998), an experience is created when a company deliberately uses services as the stage, and goods as props, to connect individual customers in a way that creates a memorable event, and charged fees. The Disney Land and Disney World, in the US are examples of how the tourism industry uses culture and creativity to attract a significant number of tourists to visit a place, and in providing a unique and distinct experience to them.

Some authors such as Hesmondhalgh and Pratt (2005) use cultural industries interchangeably with creative industries. As a result, there is little clarity and consistency in the meaning of the two concepts which is further adding on to the confusion that already exist (Galloway & Dunlop, 2007). Since creative industries are a new area which lacked reliable data in the literature, such debates are to be expected. However, this study is not going to add to the existing debate of what is essential to the creative industries but rather to explore the pragmatic use of cultural resources in Malaysia's creative economy. To date, research on this topic has been concentrated mainly in developed countries and selected developing nations such as China (Keane, 2004), India (Gibson & Kong, 2005) and Indonesia (Indonesia Department of Trade, 2008). Other developing nations have gone under the radar adding to the poor documentation of creative industries development issues (UNCTAD, 2008), despite their rich cultural heritage and pool of talent (Barrowclough & Kozul-Wright, 2008). Without access to the contemporary digital content markets (cf. Japan, Korea) many developing countries in Asia look to the advantages of tourism and the experiences that can be marketed around tourism including Malaysia. Nevertheless, research on Malaysia's creative industries is not readily available. This study will be among the first to look into this novel topic in Malaysia. Hence, the case study on an animation company in Malaysia will shed light on the content industry as the core product in providing cultural experience to their viewers. More discussion on the case study will be presented in section three.

3. Case Study on Les'copaque Production Sdn. Bhd.

Due to the novelty of this topic, case study is identified as the best method to be used in this study. This study looked at LCP experiences in developing their products and services in the creative industries sector (particularly in animation). The method used was personal face-to-face interview to obtain the best answer from the staffs in answering the semi structured questions at LCP office in Shah Alam, Malaysia. The questions were designed to answer the study's three research questions. The answers from the respondents of the case study can be categorised into seven themes. To strengthen the data, secondary data was also used and quoted when necessary.

4. Les'Copaque Production Sdn. Bhd. Interview Findings and Discussion

The findings of the case study were based on the experiences of LCP and it would be discussed according to the three research questions designed earlier for the study. This is done to ensure the findings answers all the study's research questions.

RQ1: What is the relationship between the creative industries and cultural tourism?

From the interviews with LCP and the document analysis, findings have shown a significant close relationship between the animation sector and culture for LCP product in Malaysia. The LCP staffs constantly mentioned about creative industries, creativity and Malaysian culture throughout the interviews. Their top management also kept stressing on this point when they had interviews with the local media (Patrick, 2008; Bernama, 2009; Utusan Malaysia, 2010). Although they categorised their products as belonging to the creative industries, they also agreed that culture played an important aspect in their products as well as making their products unique and different. This is in line with what the Malaysian government wants from the animation sector in Malaysia which is to have the country's national identity in their products (Muthalib, 2007). The study also supports UNCTAD's (2008) report stating that developing countries have rich cultural resources and should be used to generate their economy.

LCP realised the importance of adding the Malaysian culture to their product and services to make them unique in the market. As a result, their animation series (Upin and Ipin) and 3D movie (Gang: the Adventure Begins) portrayed the three majority Malaysian ethnics' lifestyle. Although, their products were primarily based on technology creativity but they acknowledged the importance of adding in the Malaysian culture to their animation products. This feature made it a success, different and unique from the other animation series and movies in the market. Other earlier animation companies in Malaysia had also added the Malaysian culture into their products, but majority failed to grab the attention from the local and international market. Learning from the failure of those companies, LCP managed to produce better animation and 3D products according to the government and public's requirements. LCP products managed to showcase the multiethnic culture of the country that is suitable not only for children but also adults. In directly, LCP is also promoting the Malaysian culture through their animation products. This contributes indirectly towards the tourism industry or also known as film tourism which is part of the cultural tourism sector.

Between the creative industries and cultural sector, there is a clear evident that they need each other to become more competitive to sustain their products in the market (UNCTAD, 2004; 2008). In the case of Malaysia, their multiethnic characteristic is the unique image of the country which is different from the other countries (Musa, 2000). Thus, culture has been used in many sectors particularly when the country markets their products and services to the world. The close relationship between creative industries and cultural as experienced by LCP are also taking place in other countries in Asia such as China (Keane, 2007), Indonesia (Indonesia Department of Trade, 2008), Singapore (Yue, 2006), and South Korea (Kim et. al., 2007). In these countries, the creative industries are developed alongside with the cultural sector, whether directly or indirectly.

Importantly, can LCP products compete with the animation products from the developed and significantly advanced countries in the global market? With the significant gap between the developed and developing countries in the creative industries, the possibility of developing countries like Malaysia to compete with them is almost impossible. Animation products from countries such as Australia, Japan, the United States (US) and United Kingdom (UK) are known as the market leader in this sector. Although LCP claimed they are involved in the creative industries and produced creative animation but their efforts are not 100 percent creative. It reflects more of a secondary creativity because similar products have been produced in Malaysia as early as 1978 (Muthalib, 2007).

With the rapid changes in the global technology, this sector is considerably competitive. A small company like LCP may not be able to compete with the big and established studios like Pixar and Walt Disney. Although LCP managed to expend their market in most of the countries in South East Asia, and other parts of Asia but their products are still unable to break into other regions such as the American and Europe market. Compared to animated products from Japan such as Bleech, Doremon, and Thundercats, these products have been well accepted all over the world and

the LCP animation products are far behind the Japanese. LCP can use their strength on natural resources and cheaper labour cost to come up with new ideas and services that target different market. With new networking and close ties with other animation companies from China, India and South Korea they can improve their products by sharing technologies, to penetrate these countries. From this networking and collaboration, LCP products can explore fresh ideas and make a substantial impact on the global animation market.

RQ2: How is the animation sector in Malaysia being developed?

- Animation History in Malaysia

Animation began in Malaysia with simple animation works for documentaries and public service filmlets by the Malayan Film Unit. The first Malaysian short animated film was the *Hikayat Sang Kancil* that was produced by the unit in 1978. With the support and encouragement from the government, private companies began to enter the animation market. Majority of these animated products also presented the Malaysian culture such as the Kluang Man, Usop Santorian, Anak-anak Sidek and Lat Kampong Boy. However, these series did not make substantial impact as Upin and Ipin that was produced by LCP. Also, these television series were only popular among a small group of Malaysian viewers with an exception for the Lat Kampong Boy that managed to break through outside the Malaysian market. The success of Lat the Kampong Boy is because the television series was co-produced with international companies from the Philippine, US and UK. The series was adapted from the cartoon book by Lat which is famous locally and internationally. Unfortunately, not all Malaysian have access to watching Lat the Kampong Boy because it was aired on pre-paid television channel. Further, none of these television series was made into movie like what LCP did. However, Lat the Kampong Boy stopped their production after two years of operation due to internal problems, and lacked response from the audience (Filemkita.com 2010).

Data gathered from Filemkita.com website (2010) stated that, in 1998 the first animated movie was produced in Malaysia. With a total production cost of RM 6 million, the animation called Silat Lagenda was adopted from the Malay legend of Hang Tuah and his four friends that happened in the 15th century in Malacca. Unfortunately, the response they received from the viewers was not good and only managed to collect less than Ringgit Malaysia (RM) 150,000.00. Following the first animated film, in 2001 a second animation movie called Cheritera was produced by Matahari Animation and Production Sdn Bhd, and their Indonesian partner Red Rocket Animation. Once again, this movie failed to make a mark in the market with the ticket sale collection was less than RM 3,000.00. Not long after that, another animation movie was produced and managed to collect almost RM 400,000.00. The movie titled Putih was an adaptation of the Malay classic folklore Bawang Putih Bawang Merah which can be considered a Malay version of the Cinderella story. The production of Putih did not use computer technology but instead they used traditional drawing for all the characters in the movie. Table RQ 2.1 shows more details about the Malaysian animated films.

Table RQ 2.1 Animated films produced in Malaysia

Title and Year	Producer	Total Production Cost (RM)	Story line
1998 Silat Lagenda	Peninsula Pictures Sdn Bhd	RM 6 million	Malay self defence called Silat performed by 5 youngsters
2001 Cheritera	Matahari Animation and Production Sdn Bhd, and Red Rocket Animation (Indonesian)	Not stated	Penan (native ethnic in Sarawak) Kid
2001 Putih	Eurofine Production Sdn Bhd	RM 1.1	A Malay version of Cinderella
2009 Geng: Pengembaraan Bermula (3D)	Les'Copaque Production Sdn. Bhd.	RM 4 million	Action adventure about how the twin brothers and their friends solve problem

Source: Filemkita.com, 2010

- 3D Animation Movie in Malaysia by LCP

LCP is the first animation company in Malaysia to be successful with their animation products and merchandise. Their television series *Upin and Ipin* started to make substantial impact in the Malaysian animation scene in 2008, followed by their successful 3D animated film *Gang: The Adventure Begins* in 2009. The total cost to produce the film was RM 4 million, one of the most expensive local films produced in Malaysia, but the cheapest 3D animation film produced in the world. The film and series are not only well received in Malaysia but also in the region, such as in Brunei, Indonesia and Singapore. In Malaysia itself, the film collected RM 6.3 million which is a significant collection for the Malaysian market and the local film. Today, other countries such as Singapore, Brunei, Indonesia, Turkey and India have started buying their products. Their television series and 3D animation movie have won multiple awards locally and internationally. Presently, LCP has attracted international companies such as from China, India, Indonesia and South Korea to collaborate in future animation products. In 2009, they decided to market their 3D animated movie in India, and worked with popular Indian actors like Kamal Hassan as the voices for the characters for Indian market (Isa, 2012).

With proper training and education, the LCP staffs managed to come up with quality products compared to the previous animation products in Malaysia. The exposure they got during their study particularly with the advanced technology in animation and 3D aspects today made them more imaginative with their products. They were able to use higher technology facilities at a minimal cost due to the significant support from the Malaysian government, and private agencies. For their first 3D movie, they received support from at least three ministries and two private organisations. When LCP started their operation, the Malaysian government and private agencies were more aware, and prepared with the right equipment and support compared to the last 10 years.

The significant progress of LCP animation products and merchandise in Malaysia and around Asia are a collective effort from the government, particularly MDeC and other corporate companies as compared to the previous animation companies. The establishment of MDeC has enhanced the creative industries in Malaysia to the next level. The government initiated the creative industries while the market follows the government's lead and direction. Hence, the argument in the literature that this sector is using a top down approach (O'Connor, 2007) cannot be ruled out entirely particularly in Malaysia. LCP has managed to become an eye opener in Malaysia with their animation television series and 3D animated movie. Their new ideas to produce animation products using local images and culture, but with a global appeal managed to bring Malaysian animation sector to a different level. This has also been part of the Malaysian government plan. Now, the Malaysian public has also become more aware of the potential of the Malaysian animation industry that features the Malaysian culture. On top of that, the process of developing the animation products also involved three years of R&D, brain storming, meetings, and discussions. As a result, their products entered the market with more preparation, at the right time and it met what the market wanted. Further, their products came out at the right time when the animation sector grew significantly due to the advancement of innovation in the technology sector that was happening all over the world. Today, the facilities to develop animation products are better and cheaper as compared to 10 years ago. However, LCP realised that they cannot rely too much on the government alone because the government has other commitments to other sectors as well. Thus, for the past two years the company has been actively looking for networking and other business opportunities with international companies.

RQ3: How does Malaysia positioning herself in the creative industries in the region?

For more than five years, Malaysia has been serious about having a better position in the creative industries not only in the region but also in the world. The development of creative industries have become the top priority of the Malaysian government, and have always been addressed by the country's top political leaders. At the same time the tourism industry has been the second income gainer for Malaysia for more than 20 years ago (Ministry of Tourism and Culture, 2014) hence, it is high time for both industries to work together to maximize their strength.

- Budget Allocation

In the 2010 budget, the Malaysian government allocated RM 400 million to enhance the development of the creative industries in the country. With help from the Malaysian private sectors, they worked side by side with the government on the potential of becoming the new major income contributor to the country. Unfortunately, government allocation is not easily accessible due to the tight rules and regulation imposed on the application. MDeC noticed the problem in getting the allocation approved by the government for the creativity sector which is managed by MOSTI because not many production companies have received financial assistance from this fund (Leong, 2009). Further, to receive funds for the purpose of research and development from MOSTI is also difficult particularly in the field of social science like the creative industries. Hence, funding allocation alone is not enough if the accessibility to it is too stringent and not transparent for the market players and researchers. This is an important issue that needs immediate attention from the authorities for Malaysia to have a better position in the creative industries in the region and in the world.

- Policy-makers in Malaysia

In positioning Malaysia in the creative industries in the region and in the world, it needs the right policies particularlyfrom the government as the primary policy-makers of the country. Clear policies from the government can provide a good guideline for the Malaysian creative economy players towards the right direction. From the document analysis undertaken on the major policy makers in Malaysia, this study found that the policy-makers in Malaysia demonstrated that they realised the importance of creativity, innovation and technology for the country's development. Thus, in making this a reality the policymakers worked closely with each other and with other organisations internationally and domestically to develop creative economy in Malaysia. Among the major policy-makers involved directly with creative industries development in Malaysia are; Ministry of Information and Multimedia (MIM), Ministry of Tourism and Culture (MoTAC), Ministry of Science, Technology and Innovation (MOSTI), Ministry of Higher Education (MOHE) and Ministry of International Trade and Industry (MITI). However, until today Malaysia still does not have a clear national creative economy policy although the term creativity has been used extensively by many policy makers in the country. With no clear definition on creativity and innovation in Malaysia, this slogan will remain only a slogan to the public.

There are more than five ministries in Malaysia that play major roles in the development of the creative industries in Malaysia. Thus, there are more than three Malaysian ministries (MOSTI, MoTAC and MITI) involved in assisting LCP with their 3D animated film and television series. In terms of helping the company to market their product outside of Malaysia, MITI and MDeC play a significant role. However, sometimes the roles of these ministries duplicate with each other and this can create conflict during the implementation and enforcement stage. When problems occurred, the ministries' officers tend to point fingers at each other, rather than accepting the blame. Sometimes, the debate would take a longer time to solve, and this is not productive for the development of certain sector particularly a young sector like the creative industries.

- Preparing for the Global Market

In preparing themselves to be competitive with the global animated sector, LCP introduce a slightly different formula for their second 3D movie. For a start, their second 3D animated movie which was launched in 2011 titled, Gang: Outer Space had more global features Also, the company was ready to venture into other types of movies and not just limiting themselves to animation (Raja Azaham, 2009). LCP has started join efforts with their international partners from China, India and South Korea to exchange ideas about their animated products, and co-produced animated television series and movies in the future (LCP, 2010). All of these steps are taken as their early plan to make an impact in the animation global market.

However, with the fast-changing technology happening every day, this task is never to be under estimated. To position themselves in the region requires careful R&D and innovative plan. This is a competitive market and LCP is facing fierce competition locally and globally. Also, more governments around the world and in the Asian region such as China, Indonesia, Singapore and Thailand are investing billions to develop their creative industries. To compete with the animation products from the developed countries particularly, it is almost out of reached by a small company like LCP due to their more advanced technology and strong financial background. Thus, what LCP can do is perhaps to use the available advantage which is culture and other resources that they have around them which are lacking in the developed countries.

5. Conclusion

The successful collaboration between the government and private organisations are crucial in developing a new sector such as the creative industries. Both parties need each other for the benefit of the country's socio-economy sector. Florida (2005) stated that, creative cities need creative governments, creative leadership, and creative communities. All stakeholders must work together for the success of this new economy model which will benefit the local economies. To stay competitive and relevant particularly for developing countries such as Malaysia, the creative industries need the support from other traditional sectors particularly the cultural industry. Culture is one of the strength for Malaysia which other developed countries maybe lacking. Although LCP products and services involved strong modern technology application but their major success is based on the Malaysian culture that they portrayed in their animation and 3D movie. This element adds more value to their products and services, and makes their products unique to the market. Their new collaboration with the *Ultraman* series producer will boost their brand name both locally and internationally particularly in Asia. The priority of this study is not to generalise the study findings, but rather to provide a rich sound background for future studies to further investigate the topic from a different context and using different approaches. As UNCTAD (2004; 2008) suggested, more attention should be given to developing countries pertaining to this topic particularly countries that have been ignored in the literature such as Malaysia. The current research is expected to benefit the key players and policy makers in creative industries development, in gaining a better understanding on how they can work together with the tourism industry in attracting more tourists to Malaysia. Perhaps creative tourism is the right term to use to represent the marriage between the creative industries and the tourism industry.

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KEY DETERMINANTS AFFECTING POTENTIAL CONSUMERS' PREFERENCE TOWARDS GREEN HOTELS IN MALAYSIA

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ABSTRACT

In the hospitality and tourism industry, organisations are moving towards a more sustainable practice whether in the environmental, social or economic aspect. In Malaysia, although the concept of green hotel is not new, it is still considered to be at its infancy stage. The main objective of this paper is to assess the effect of green hotel practices, in particular the four dimensions - energy efficiency, water efficiency, recycling efforts/waste management and air quality management towards potential guests' preferences and to provide insights on the generational differences on preference for green hotels. A quantitative study was conducted on potential green hotels' guests in whereby 471 data was collected and analysed using SPSS. The results showed that potential guests preferred green hotels that have waste management and energy-saving features. Contrary to popular belief that generation Y has higher tendency to support green efforts, this study also concluded that generation X are more willing to stay at green hotels when traveling. Thus, through this study, hotels that dwell in green practices can efficiently utilize their resources and implement practical sustainable efforts to attract potential guests.

Keywords: green hotel, sustainability and generational differences.

1. Introduction

In Malaysia's Third Industrial Master Plan (IMP3) period 2006-2020, the service sector was positioned as a major source of the country's economic growth which includes the hospitality, tourism, education and medical sector (IMP3, 2006). Advancing from this, it is timely to conduct this study as the hospitality and tourism sectors in Malaysia are gaining greater attention due to its foreseeable contribution to the nation. Malaysia, viewed as one of the most popular holiday destinations in Asia received a high number of tourists arrivals each year. In the report published by United Nations World Tourism Organisation (UNWTO), Malaysia posted a solid growth of 7% increase in international tourists' arrivals in year 2014 compared to the previous year (www.e-unwto.org, 2015). Based on the statistics released by Tourism Malaysia (n.d.), Malaysia recorded a total of 57.1 million hotel guests in 2013 where 34.2 million of them were local lodging guests. As such, studies on consumers' behaviour towards hotel preference are vital.

In today's global service environment, there has been an increasing demand for organisations to establish sustainable operations through green practices. This environmental pressure has also affected the tourism and hospitality industry. This is because environmental pollution such as air and water pollution caused by the tourism and hospitality industry have become a growing worldwide concern. In particular, Gustin and Weaver (1996) listed that some of the negative impacts from hotel operations include the extensive wastewater from laundry, high disposal of food products, additional electricity and energy consumption for heated swimming pools, and the use of harmful detergents or cleaning chemicals.

Likewise, there is a diverse understanding of green hotel practices and there is a lack of studies conducted in identifying which aspect of these green practices that would have the most impact on potential consumers. As such, this study would be focusing more on certain functional standards that are outlined by Bohdanowicz (2005) and the ASEAN National Tourism Organizations in accordance to the requirement for ASEAN green hotel standard. The key areas include energy efficiency, water efficiency, recycling efforts or waste management and air quality management. By understanding the impact of these four dimensions of green practices on potential consumers, it is hoped that the hotels in Malaysia can confidently implement their efforts to remain as the preferred green hotel.

Complementary to this, some studies have been conducted to investigate generation Y's perception of green hotel practices, yet still very few studies shed light on the implications of generational differences on their preference towards green hotels. Previous generational studies tend to focus more on understanding generational behavioural differences in the workplace from the human resource management aspect. Thus, besides examining the relationship between the green hotels' practices and the consumers' preferences, this study will also disclose if there are generational differences in those preferences for green hotels in Malaysia.

2. Literature Review

2.1. Green hotel dimensions

Despite the growing focus on the need for environmental protection, many hotels are still struggling to implement clear environmental policies. One of the main challenges that hotels face is the need to strike a balance between its green practices and meeting different consumers' demand. On one hand, hotels strive to operate responsibly but certain hotel guests continue to seek for extras such as high pressure showers, generous supplies of linens and highly varied buffet spread. Thus, hotels that have decided to position themselves as 'green' hotels has to openly communicate their environmentally-friendly practices by placing cards or signage in highly noticeable areas. This is a similar trend being observed in Malaysia to educate the guests on the hotels' green practices.

In trying to understand what entails as a green hotel, Timothy and Teye (2009) described that common green practices include having a green supply chain where the hotel buys eco-friendly or locally-sourced products, uses recyclable materials and packaging. In addition, a green hotel also sees that they use energy and water responsibly to avoid wastage. The term 'green' hotel is often interchangeably used with eco-friendly hotel or environmentally-friendly hotel. The increasing interest in the Asian region to 'go-green' is due to the awareness programmes that the local government has implemented (Kaman, 2008) but since there are many ways that the hotel can 'go-green', this adds difficulty to defining a green hotel (Millar & Baloglu, 2008).

Indeed it has become crucial for hotels to practice environmentally friendly ways of conducting business due to the increasing numbers of green consumers (Manaktola & Jauhari, 2007). Numerous studies have applied by Ajzen and Fishbein's theory of reasoned action (TRA) that was developed in 1967 to demonstrate that an individual's values will shape his or her attitudes toward embracing environmental friendly practices and as a result, trigger that individual's behaviour intention to purchase or choose certain brands. Subsequently, there is a positive relationship between returning consumer environmental behaviour and tourists' propensity to stay in a green hotel, particularly in the Malaysian context as discovered by Mohd Suki and Mohd Suki (2015). Particularly, gender comparison studies in this area have found that women consumers' favourable perception affected their preference of green hotels (Kasliwal & Agarwal, 2015). Knowing this, hotels must start to implement and promote eco-friendly practices. Despite this, green practices are quite diverse in the hotel industry.

In a study by Hartmann and Ibáñez (2006), they found that 'green' brands usually consist of a set of attributes and benefits that helps to reduce negative impact towards the environment and at the same time is able to create positive image among their customers through their environmental concern efforts. According to the ASEAN Tourism Standards that sets the criteria and guidelines for the ASEAN Green Hotel Awards, green hotel is generally defined as a hotel that is environmentally friendly. Similarly, the Ministry of Tourism Malaysia (2013) published the guidelines for green hotel classification which was adopted from the ASEAN green hotel standards. Besides having the star or orchid classification, the guideline states that scores above 50% based on criteria related to environment conservation can also be rated as a 'Green Hotel'. There are 10 criteria altogether - environmental policies and human resource development; green products usage; collaboration with local community; solid waste management; energy efficiency; water efficiency; air quality management; noise pollution control; wastewater management; and toxic and chemical management.

As the consumers become more knowledgeable and aware about sustainability issues, this has a significant influence on their preferences and choice for hotel stay. Consequently, hotels that show that they have proper environmental policies in place are able to attract consumers that are environmentally conscious. In a study by Kasim (2004), he discovered that tourists who visited Penang, Malaysia, preferred hotels with water and energy saving features, recycling containers and information on local ecotourism attractions. Noor and Kumar (2014) also confirms that tourists with high environmental attitudes prefer to stay in green hotels and there is significant relationship between ecotourism activities and intention to stay at a green hotel among tourists. Although there is an increasing prominence on environmental awareness, so far only 10 hotels in the whole of Malaysia have met the standards and been awarded with the ASEAN Green Hotel Awards in year 2014 (Malay Mail Online, 2014).

Whereas, the Green Hotel Association (2007) views green hotels as properties that are predominantly environmentally-friendly that drives water and energy conservation programmes and solid waste reduction while reducing harm towards Mother Earth and cutting costs. Unambiguously, past analysis conducted on green hotels generally outlined the four dimensions, which are energy efficiency, water efficiency, recycling efforts/waste management and air quality management (Alexander, 2002; Graci, 2002; Bohdanowicz, 2005; Jhawar, et al., 2012).

The first dimension that will be assessed in this study is energy efficiency. Energy is vital throughout every hotel that has direct influence on customer satisfaction and is among its top three operational costs. Energy consumption is mediated by occupancy and weather conditions (Hilton Worldwide, 2013). Due to the hot and humid weather in Malaysia, most of the hotels' electricity consumed is used for air-conditioning, lighting and other electronic equipment in the rooms. Unfortunately, some hotel guests tend to leave their air-conditioning and television on throughout the day even when they are not in the rooms. Higher electricity consumption leads to higher emission of carbon dioxide (Co2) that contributes to global warming. There are numerous methods that hotels can involve in conserving energy; among others is by investing in more efficient electrical appliances, replacing traditional light bulbs with LED lights, introducing automated switches and smart elevators. Besides utilising energy–saving technology, the hotels' staff can closely monitor their electricity consumption by installing power meters and regular scheduled maintenance. Past researches have suggested that the hotel staff's attitude towards green programmes also influences the hotel's green efforts (Perron, et al., 2006). By integrating human factor and energy efficient appliances, the commercial sectors in Malaysia can use efficient electrical appliances to effectively reduce energy usage and thus reduce their overall operational cost (Ponniran, et al., 2013). Of recent, researchers have also proposed the usage of alternative renewable energy such as biomass, wind and solar for a more sustainable resort development in Malaysia (Darus, et al., 2009).

Moving forward, water is another scarce resource that is commonly neglected. For hotels, water is usually consumed by the guests and employees. In a study conducted by Tang (2012) on two different Malaysian resorts located at Langkawi and Miri respectively, the average daily water consumption per guest is around 500 litres. Hence, water conservation is highly important to preserve clean and safe water. In terms of water usage, there are many ways that hotels can help to reduce wastage. Green hotels uses a variety of water saving technologies and techniques such as having low flow showers, sensor taps or automated flushing toilets and only changing the bed sheets when requested by guests. Hilton Worldwide (2013) invested in LightStay™, a proprietary system that traces sustainability performance and based on the calculation of this tool, they have managed to reduce water consumption by 10.2% in 2012 compared to the year before. For a luxury resort or full serviced hotel, water is also used to provide services such as spa, sauna, swimming pool, and laundry services and these hotels can invest in rainwater tanks for harvesting and recycling purposes. By improving water consumption efficiency, it not only helps to save the environment but ultimately the hotels benefit from huge savings as well.

A study has shown that due to the rapid increase in urbanization in Langkawi, the methods used for managing solid waste are insufficient and not sustainable (Shamshiry, et al., 2011). One of the reasons that waste management efforts were not successful was because employees in SME hotels did not understand the reason for separating waste (Kasim, 2007; Kasim, 2009). Over the years, the waste generated in Malaysia has continued to rise; calling for a proactive movement among the hotels to be more engaged in recycling programmes. In the last decade, numerous hotels have increased their efforts to reduce wastage by donating excess food, unused soap and other items such as towels and comforters (Shanklin, et al., 1991; Alexander, 2002). Besides composting organic waste or converting to biogas, other materials such as plastic, glass, paper and aluminium can be segregated for recycling. Interestingly, contemporary hotels in Malaysia have incorporated furniture and decor made from recycled materials such as pallets and glass bottles. However, some of the hotel guests find that such acts of reusing, reducing and recycling merely gives the hotels a negative image of being 'cheap' or tacky (Millar & Baloglu, 2008). As such, green hotels need to create a high level of awareness and educate both guests and employees on their waste management efforts to obtain their support.

The last important dimension is air quality management by hotels whereby they seek to provide clean air and minimize air pollution especially indoors. Poor ventilation and air-conditioning system have high tendency for mould and bacteria to spread. In order to maintain clean air, green hotels shouldn't use strong and harmful cleaning detergents and aerosol pesticide sprays. Moreover, they are responsible to conduct regular inspection and maintenance of the building to avoid leakage of toxic substances. Although Malaysia's Tobacco Product Regulations 2004 prohibits smoking in hospitals, public elevators and toilets, and other indoor public places; but it does not restrict smoking in guest rooms of hotels or other lodging (Malay Mail Online, 2015). Generally, for hotels, inns, resorts and other hospitality related buildings in Malaysia, there designate some rooms as "smoking" and others as "non-smoking". Nonetheless, there has been an increase in the number of hotels practicing a strict 'No Smoking' policy such as Tune Hotel, Marriot Hotel, and Sunway Hotel. This policy supports 'smoke-free' environment whereby smoking is prohibited in any part of the hotel except at the designated smoking areas. Indeed, the smoke-free policy benefits both hotel guests and the employees as it reduces air pollution in the hotel and helps to make the working environment more conducive.

Significantly, majority of the studies conducted are geared towards predicting consumers' attitude towards green hotels by profiling them or using certain demographic characteristics (Vaske & Kobrin, 2001; Han, et al., 2009; Kasliwal & Agarwal, 2015; Mohd Suki & Mohd Suki, 2015). Although there are some links which were drawn, it is not clear if indeed the preferences for green hotels are different between the generations.

2.2. Generational Differences

The evolution of generations has seen each generation portraying different experiences, values, beliefs and attitudes. Generational studies were mainly used by marketers to understand their buying behaviour and hence position themselves to appeal to a specific customer group. Previous multi generation studies mainly used cross-temporal meta-analysis (Twenge, et al., 2012) and have pointed to the existence of generational differences between Baby Boomers, Generation X and Generation Y (Smola & Sutton, 2002).

The Baby Boomers are those born between 1940 and 1964 and are in the 51 to 69 years of age as of 2015. The Baby Boomers are often said to be more individualistic and workaholic, hence also known as the 'Me Generation' (Williams & Page, 2011). Although Gursoy, et al., (2008) found that they are quite resistant to new ideas; this generation has shown that they are increasingly more environmentally conscious though they place high importance on economic feasibility (Posnock, 2004). This means that when supporting green products or services, they will want to ensure that the benefits outweigh the cost.

The generally accepted range for Generation X is those born between 1965 and 1980 means currently they are between the age of 35 to 50 years old (Archana & Heejin, 2008; Erickson, 2008). The 'Why Me Generation' places great importance on family values and tolerates multiculturalism. They are fiercely independent and well-educated (Ritchie, 1995). This makes them highly skeptical and cautious with products that has eco-label. Although they are concerned with the environmental issues, they are not prone to being proactive or engaged in green products and services (Ballantyne and Packer, 2013).

On the other hand, Generation Y or popularly known as Millennials or 'Generation We' were born between 1979 and 2000 (Rich, 2008; Littman, 2008). This generation is more Internet-savvy and between the age range of 15 to 34 years old (Spiro, 2006). The 'Why Generation' is confident and image-driven but they are not as independent as Generation X. As this generation tends to view social acceptance as crucial, their choices are often determined by peer recommendation (Littman, 2008). Studies have found that majority of Generation Y are civic-minded and seek for products and services that gives back to the society and environment. Thus, they would most likely support volunteerism and the green concept (Kim et al., 2011). Although they are willing to give back to the society, Generation Y consumers have relatively low knowledge about sustainability (Kagawa, 2007). Moreover, Twenge, et al. (2012) concluded that there was a drastic decrease among Millennials in wanting to take action to help the environment these days.

With these changes taking place, it would be interesting to see which of the four dimensions of a green hotel has the largest influence on these three generations in Malaysia.

3. Methodology

This study used secondary data such journal articles, websites, books and other publications to gain understanding of the subject matter. In addition, since the objective of this study was to gather the information on preferences of potential respondents towards green hotels' practices, a quantitative approach was employed. The self-administered questionnaire was distributed using Google™ online survey form. The survey instrument had two parts. In the first part, there were 15 questions measuring the four dimensions of green practices and two questions to measure their preference towards green hotels which were generated based on the review of the literature. A 5-point Likert scale items from "strongly disagree" to "strongly agree" were used to measure their responses. As for the second part, demographic data were requested namely age, gender, and current residential state. The data was collected using snowballing sampling method from potential green hotel guests from around Malaysia starting with the researchers' personal contact list. A total of 480 responses were successfully gathered. However, only 471 responses were valid and analysed using The Statistical Package for Social Sciences (SPSS, Version 20.0). Descriptive analysis and multiple regression analysis were conducted to provide answers to the research objectives outlined earlier and the findings were presented in the following part.

4. Results and Findings

4.1. Demographic Profile

The demographic profiles of the respondents are presented in Table 1 whereby the majority of the respondents are female (53.7%). Over 38.9% of the respondents are between the age range of 15 to 34 years old (Generation X). As snowballing sampling method was used, majority of the sample was drawn from those who resided in Kuala Lumpur (38%) and Selangor (11%).

Table 1 Demographic Characteristic

Characteristics	**Frequency**	**Percentage (%)**
Gender:		
Female	253	53.7
Male	218	46.3
Age group:		
15 years old to 34 years old	183	38.9
35 years old to 50 years old	138	29.3
51 years old to 69 years old	150	31.8
Residential State:		
Federal Territory of Kuala Lumpur	179	38
Selangor	52	11
Johor	24	5.1
Penang	20	4.2
Sarawak	19	4.0
Kedah	18	3.8
Negeri Sembilan	18	3.8
Pahang	18	3.8
Perak	18	3.8
Malacca	17	3.6
Terengganu	17	3.6
Kelantan	16	3.4
Perlis	16	3.4
Sabah	16	3.4
Federal Territory of Labuan	12	2.5
Federal Territory of Putrajaya	11	2.3

Source: Survey data

4.2. Effect of the Four Dimensions of Green Practices towards Consumer Preferences

Based on the main research objective which is to ascertain the relationship between the green hotels' practices and the consumers' preferences towards green hotels, a multiple regression analysis was conducted.

Table 2 Multiple Regression Result for Relationship between Consumers' Preferences and Green Hotel Efforts[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df1	Sig. F Change
1	.661[a]	.436	.431	.82068	.436	90.168	4	466	.000

[a.] Predictors: (Constant), AirQualityMgt, EnergyEfficiency, WaterEfficiency, WasteMgt
[b.] Dependent Variable: Consumer Preference

Table 3 ANOVA[a] Result for Significance of Multiple Regression Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	242.918	4	60.730	90.168	.000[b]
	Residual	313.857	466	.674		
	Total	556.775	470			

[a.] Dependent Variable: Consumer Preference
[b.] Predictors: (Constant), AirQualityMgt, EnergyEfficiency, WaterEfficiency, WasteMgt

The prediction model was statistically significant, F (4, 466) = 90.168, p <.005 (Table 3) and as can be seen in Table 2, the four variables accounted for approximately 43% of the variance of consumer preference (R^2= .436, Adjusted R^2=.431). As can be seen in Table 4, all correlations for waste management, energy efficiency and air quality management were statistically significant (p<0.05) except for water efficiency (p = 0.209). Comparing standardized coefficient (β), the waste management efforts explained the largest portion (40%) of the variation in potential consumers' preference for green hotels; followed by hotels that has energy efficient practices (22%); and lastly, air quality management (10%).

Potential guests, especially those between 35 to 50 years old, preferred hotels that has paperless policy and uses electronic systems. These guests were also particularly open to the idea of hotels utilizing recyclable materials as furniture or décor and providing recycling bins to segregate waste. In addition, green hotels can implement more efforts in managing waste such as proper disposal of packaging materials and composting of food waste rather than sending it to landfills or donating them. However, the findings by Okazaki et al. (2008) indicated that hotel employees perceive activities to reduce waste especially food waste as less important. This gap between consumer perception and employee perception could be one of the areas where green hotels need to manage closely to achieve competitive advantage for the green hotel. For example, hotel managers are encouraged to engage with hotel guests to conduct educational waste management programmes because they are the closest link to all the stakeholders (Sharma, et. al., 2007).

Table 4 Comparison of the Four Dimensions of Green Practices towards Consumer Preferences

Dimensions of Green Practices[1]	Coefficients	P-value*
Waste Management	0.403	.000
Energy Efficiency	0.217	.000
Water Efficiency	0.055	.209
Air Quality Management	0.092	.040

[1] Variables for the scales were coded on a five point scale; 1 = strongly disagree; 2= disagree; 3=neither agree nor disagree; 4= agree; and 5= strongly agree.
*Significant at p<0.05

4.3. Generational Difference towards Green Hotels

To test the relationship between generational groups and preference for green hotels, ANOVA was employed. Based on Table 5 results, there was a statistically significant difference between Generation X, Generation Y and Baby- Boomers as determined by the one-way ANOVA test ($F(2, 468) = 11.64$, $p = 0.00$). A Tukey Post-hoc test (Table 6) revealed that the consumer preference for green hotels was significantly lower among Generation Y (mean = 3.5055, $p = 0.00$) and Baby-Boomer (mean = 3.6867, $p=0.005$) compared to those in Generation X (mean = 4.0797). Therefore, there were no significant
difference between the Generation Y and Baby-Boomer groups ($p=0.271$) in their preference for green hotels.

According to Kim, et al., (2011), Generation Y guests were more willing to pay extra to stay at green hotels provided that the hotel communicates its eco-friendly practices through advertisements and provides organic food. Thus, even though Generation Y is known to be more supportive of the social and environment practices (Williams and Page, 2011; Kim et al., 2011), they require more information to make decisions. Compared to Generation Y, the Generation X were known for being skeptical and slow to adapt (Gursoy, et al., 2008; Twenge, et al., 2012) but from this study, it has shown that Generation X were more willing to choose a green hotel when travelling. This supported Ballantyne and Packer's (2013) research that Generation X is environmentally conscious. Referring to Table 7, Generation X respondents preferred green hotels that has waste management (mean = 3.9188) and energy efficient (mean = 4.0749) efforts compared to Generation Y and Baby Boomers.

Table 5 ANOVA result of comparison between generational groups' preferences towards green hotel practices

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.384	2	13.192	11.640	.000
Within Groups	530.391	468	1.133		
Total	556.775	470			

Table 6 Comparisons between Generational Groups' Preference for Green Hotels

(I) Age group/generation	(J) Age group/generation	Mean Difference (I-J)	Std. Error	Sig.
15 years old - 34 years old	35 years old - 50 years old	-.57425*	.12002	**.000***
	51 years old - 69 years old	-.18120	.11725	.271
35 years old - 50 years old	15 years old - 34 years old	.57425*	.12002	**.000***
	51 years old - 69 years old	.39304*	.12557	**.005***
51 years old - 69 years old	15 years old - 34 years old	.18120	.11725	.271
	35 years old - 50 years old	-.39304*	.12557	**.005***

*The mean difference is significant at the 0.05 level ($p<0.05$)

Table 7 Comparison of generational groups' preferences towards green hotel practices

Generation Groups		Consumer Preference[1]	Waste Management[1]	Energy Efficiency[1]	Water Efficiency[1]	Air Quality Management[1]
Generation Y	Mean	3.5055	3.5661	3.8434	3.5501	3.9440
	N	183	183	183	183	183
	Std. Deviation	1.08940	.70161	.87063	.96319	.70170
Generation X	Mean	4.0797	3.9188	4.0749	3.6377	3.9185
	N	138	138	138	138	138
	Std. Deviation	.95567	.85492	.68588	.78559	.53709
Baby Boomer	Mean	3.6867	3.5467	3.6044	3.8800	4.0767
	N	150	150	150	150	150
	Std. Deviation	1.12707	.87521	.92556	.91167	.80422
Total	Mean	3.7314	3.6633	3.8351	3.6808	3.9788
	N	471	471	471	471	471
	Std. Deviation	1.08841	.82079	.85797	.90691	.69598

[1] Variables for the scales were coded on a five point scale; 1 = strongly disagree; 2= disagree; 3=neither agree nor disagree; 4= agree; and 5= strongly agree.

5. Conclusion

The findings confirmed that potential hotels' guests in Malaysia preferred green hotels that have waste management efforts, followed by energy-saving features and lastly hotels that have proper air quality systems. However, water saving efforts did not have any impact on their preference for green hotels. Contrary to popular belief that generation Y has higher tendency to support green efforts, this study also concluded that generation X preferred to stay at green hotels when traveling.

Particularly, this study's result contributes significant knowledge for the hotel managers in Malaysia that plans to strategically implement green practices to capture the market segment. As the green momentum grows more global, this is viewed as an opportunity for green hotels to create competitive advantage and socially responsible by protecting the environment at the same time. In Malaysia, going green is still considerably a new practice. Despite this, hotels such as Marriot and Shangri-La in Kuala Lumpur have adapted themselves into the green movement. Some of their efforts include implementing the towel re-using programme, installing solar panels to generate electricity and recycling materials. The results of this study offer useful information on green consumers for hotel managers and practitioners. This research suggests that the potential guests' preference towards green hotels is influenced by specific operational environmental practices in energy, water, air or waste management. Evidently, a hotel with sound green practices can achieve cost benefits and appeal to the customers.

As this study only focuses on the four dimensions of green hotel practices as mentioned above, a more holistic view can be obtained by using all ten dimensions as outlined by the ASEAN green hotel standard and Ministry of Tourism Malaysia. By incorporating these dimensions into the studies and comparing between consumers' expectation and perception would provide a better predictive model and identify the 'green gap' that hotels should improve upon. Nevertheless, sustainable hospitality and tourism practices are not just dependent on consumers'. It is also a concerted effort and support from the Malaysian government to initiate and enforce sustainability policies to preserve the country's environment. Malaysia's Tourism and Culture Minister, Datuk Seri Mohamed Nazri Abdul Aziz, while presenting the Green Hotel Award viewed this bi-annual award as an integral initiative to develop the ASEAN Ecotourism Strategic Plan which promotes responsible tourism and green practice in the tourism industry (Malay Mail Online, 2014).

As this study is only limited to potential guests' preference, equally important is to discover hotel employees' level of commitment and their willingness to participate in the green activities that the hotels choose to embark in. Hence, the underlying individual values that play a major rule in forming attitude and behavior intention should be included to gain a more conclusive result. In addition, another limitation of this study is that the majority of the sample respondents were those staying around Kuala Lumpur and Selangor area. Thus, this study makes a simple inference to generalise the green attitude between the generational groupings while ignoring heterogeneous characteristics. Life course research detected strong relationship between cognitive, affective and behaviourial historical experiences and current choices (Eagly and Chaiken, 1993; Chatrakul Na Ayudhya et. al., 2014). Han, et al. (2010) used the Theory of Planned Behavior (TPB) to the decision-making process of green hotel guests. Thus, future studies should take into consideration individual's life experiences and social influences to unfold how these three factors influence their present attitude and decisions as well.

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INTRODUCTION TO A PSYCHO-ECOLOGICAL STUDY ON DISTURBANCE BEHAVIOUR OF ECO-TOURISTS ON WILDLIFE

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ABSTRACT

Wildlife tourism involving wildlife watching can adversely affect the environment. There are many controversies regarding wildlife watching tourism. Some conservationists believe that it is extremely likely to negatively disturb wildlife along with their habitats. Other conservationists believe that this sort of tourism if properly managed, can assist biodiversity conservation. Bird-watching is one of the subgroups of wildlife tourism that is becoming more widespread in Malaysia. There is a growing concern regarding human disturbance on wildlife related to wildlife recreation. Unfortunately, social scientific analysis of the relationship between outdoor leisure and wildlife disturbance is still inadequate. The review has shown three essential gaps in Socio-Ecological science. (1) The lack of an existing theory to clarify the relationship between conservation science and social science constructs. (2) A need for psycho-ecological studies to recognise the effective factors of behavioural intentions for conservation planning. (3) A general absent of strong testing and validation of social measures included in conservation planning studies. To sum up, if we want to use tourism as a conservation tool, we must study the behaviour and psychology of tourists as well as wildlife.

Keywords: Psycho-ecological study, disturbance behaviour, wildlife and tourist behaviour.

1. Introduction

There is a growing concern regarding human disturbance on wildlife owing to increasing human access to the countryside (Martínez-Abraín, et al., 2010). Human disturbances to wilderness and animal habitats can be different in both time and frequency, along with the degree of intensity of the disturbance: all of which alters the importance of their impact on wildlife (Catibog-Sinha, 2010). An example that regularly occurs lies in the reaction of wild birds to the proximity of human presence. When approached by humans, a bird is likely to alter its behavioural reactions or physiological processes (e.g. flight responses or an increase in heart rate). Despite the fact that these responses tend to be fleeting, they can lead to severe adverse effects in the long-term such as breeding birds being flushed out and leaving their nests, making the eggs or chicks vulnerable to any predators. In environments that are regularly disturbed by humans, breeding performance is likely to decline sharply, leading to the reduction of the number of breeding locations, eventually diminishing the bird population (Steven, et al., 2011).

The report on the impacts of bird-watching on species in Australia by Jones and Nealson (2005) indicated that undisturbed places had immensely higher average numbers of species compared to semi-disturbed and disturbed places. This applied to both rainforest and eucalypt areas. These results support the notion that even activities considered gentle and not harmful, such as bird-watching could adversely affect the avian life and their habitats. No matter how well-organised a tourist expedition, it is impossible to secure an assurance of there being no effect on delicate environments. Frequently undesirable impacts are both obvious and instant, such as when cranes fly into power lines to escape the presence of humans. Some other impacts are less direct, with a slow cumulative effect that eventually shows a serious degree of damage (Green & Higginbottom, 2001). The Indo-Malayan, Afrotropical and Australian eco-zones are lacking in studies of recreational effects, even though these eco-zones are all extremely rich in bird species. South America and Europe, and the United States of America have all been studied to some degree; however, there is very little research on Asia, Africa, Central America and mainland Australia (Steven et al., 2011).

The popularity and frequency of bird-watching are increasing on a global scale as means of recreation. Several problems can be recognised from a close reading of both local and international literature, especially the interviews with experienced personnel who work in the Australian government conservation agencies. These problems are both latent and manifest. The negative effects on wildlife caused by wildlife tourism, particularly for the current study's concerns about birds, can be categorised into three groups: "(1) disruption of activity, (2) direct killing or injury, and (3) habitat alteration (including the provision of food)". There is the possibility of extreme variation regarding the quantity of negative

effects on wildlife. This definition covers most of the potential negative effects on wildlife, especially birds (Green & Higginbottom, 2001). The negative effect of birdwatchers on birds in Malaysia can be specified for the development of the instrument for future research.

Furthermore, the science supporting conservation planning is undergoing a renaissance, with widespread and increasing acknowledgement of the importance of understanding the socio-ecological context of planning regions (Chan et al., 2012). Social research provides tools and techniques for understanding the feasibility of conservation actions. Social research can also assist with the identification of the scope of conservation problems, such as the identification of key stakeholders who have an interest in or an influence on the conservation problem and the characteristics of management and analytical contexts that may influence the problem. Most conservation planners are trained as biologists or ecologists and must, therefore, continually acquire new knowledge and skills in the social sciences. Conservation planners are encouraged to explicitly and comprehensively justify their rationale for integrating social theory, such as the theory of planned behaviour, into conservation planning theory. A critique of existing social science theory relevant to the research problem may promote the development of new, integrated conservation planning theory. The review may also reveal the absence of an existing theory or a set of variables to explain the relationships between conservation science and social science constructs. Furthermore, a general absence of robust testing and validation of social measures included in conservation planning studies was noted (Raymond & Knight, 2013).

Also, social scientific analysis of the relationship between outdoor recreation and wildlife disturbance is still regrettably limited. The challenges of understanding human values, attitudes and behaviour, and identifying appropriate mechanisms and interventions to influence these are still mostly unsolved problems of social science. (Marzano & Dandy, 2012b). Overall, introduced gaps from this paper are relevant to outdoor recreation, and theories and models of human behaviour that could be useful for guiding management responses to bird disturbance.

2. The impacts of wildlife tourism on birds

There is very little research involving the social operators of wildlife disturbance such as norms. Some of these human dimensions have been analysed in closely related areas, such as the effect of norms on wilderness recreation experiences and behaviour (Shelby & Vaske, 1991; Marzano & Dandy, 2012a;). On the other hand, the only aspect to have undertaken any persistent research in the recreational disturbance literature is on perceptions that recreationists have of their (and others') influences on the wildlife. Some studies have explored whether there is a positive relation between participation in the outdoor recreation and worry for the environment with research into this relationship beginning in the 1970s (Geisler, 1977).

There have been difficulties in collecting evidence to prove a strong, direct link. On the other hand, some studies have found that participation in recreation can increase pro-environmental behaviour such as belonging to an environmental organisation, campaigning for environmental issues or joining in an environmentally friendly activity such as green consumerism (Larson, et al., 2011). Nonetheless, there are studies which recommend that in spite of holding strong conservation values, people can disengage worries about the environment from how they separately behave outdoors (Lemelin & Wiersma, 2007). The form of recreational pursuit and favourite places to perform that activity as well as place attachment are also said to have a bearing on environmental attitudes (Dorwart, et al., 2009; Lee, 2011).

A few studies have shown social research with recreationists themselves, focused mainly on wildlife, rather than habitats. For example, in a study on recreational disturbance of mammals in a US State, Taylor and Knight (2003) surveyed trail users, including hikers, mountain bikers and horse riders, on issues such as whether recreational activities affect negatively on wildlife and which user group was held most responsible. Another survey (Sterl, et al., 2008) accomplished in an Austrian urban national park during winter explored visitors alertness of the potential impacts of their activities on wildlife. These studies found that recreational users can be mainly unconscious of the results of their activities for wildlife, and are probable to hold other user groups responsible for negative effects (Manning et al., 2004; Marzano & Dandy, 2012b). Taylor and Knight (2003) reported that fifty percent of those surveyed did not believe that recreational activities had any effects on wildlife. Sixty percent of visitors in Sterl et al. (2008) study believed the same view. Explanations for this is related commonly to considerations of 'suitable' behaviour (such as sticking to trails, following prescribed rules and being quiet), though some recreationists simply felt they were not disturbing wildlife if they did not see any (Sterl et al., 2008). Taylor and Knight (2003) also showed that recreational users undervalued the distance over which wildlife are disturbed (Symmonds, et al., 2000).

There is obviously a substantial gap in our understanding of the social facets of recreational disturbance. Integrating ecological impact studies with social data on recreationists' values, attitudes and behaviour may well suggest

to more useful and socially acceptable management actions (Taylor & Knight, 2003). On the other hand, there are few studies of recreational disturbance which draw directly on established behaviour theory to offer analytical directions or framing and none that relate directly to, or present principal data from research on the bird-watching in Malaysia.

There are numerous approaches in which human behaviour is conceptualised and studied. The most common viewpoint, established upon social psychological research, focuses on the individual who selects about how they behave (a cognitive perspective). They can be influenced to a greater or lesser degree by external factors such as social burdens or economic capability. Some cognitive models have been applied to forecast recreationists' behaviour in the outdoors (Martin & McCurdy, 2009). The theory of planned behaviour (TPB) (Ajzen, 1991) is one of the most broadly cited and applied theories adopting the cognitive views, and statements that intention is the best predictor of actual behaviour. It suggests attitudes towards a behaviour (and its outcomes), subjective norms (that is perceived social pressures) and perceived behavioural control as three principle causes of intention (Marzano & Dandy, 2012b).

It can be enormously challenging to detach or draw boundaries around these different factors and recognise which ones may be most important in how people feel about, and involve in recreational activities. Behaviour theories offer many concepts and notions which nature managers can utilise when looking for understanding and addressing the disturbance of wildlife by recreationists. Nevertheless, some of the notions provide more practicable and instant ways to understanding and affecting behaviour than others (Marzano & Dandy, 2012b).

3. Human behaviour and disturbance on wildlife

Recreational activity involving wildlife viewing can adversely affect the environment. Reviewing the literature relevant to recreation ecology that has published in academic journals in the English language identified 69 articles from 1978 to 2010, were concerned with the effects of this type of activities on birds. Negative impacts were found in sixty-one of these papers (88%). This included alterations in avian physiology (all 11 papers). 37 out of 31 pages found changes in the immediate behaviour of birds. Still, other papers found changes regarding avian abundance (28 out of 33 papers), and 28 out of 33 papers established changes in avian reproductive success. Most of these past studies have been concentrated in a small number of countries, specifically Argentina, the United Kingdom, the United States and New Zealand. These studies are also narrow in that they have focused mostly on cool temperate or temperate climatic zones. Frequently they have been restricted to wetland habitats or shoreline habitats. The examined foraging guilds were usually crustaceovore/ molluscivore, carnivores or insectivores. Certain vast regions – indeed, entire continents - of the world that have both high bird diversity and nature-based recreation like mainland Australia, Central America, Asia, and Africa can only be considered barely studied, or have hardly been studied at all (Steven et al., 2011).

Human disturbances regimes vary in duration, intensity and periodicity which will change the significance of their impacts on wildlife (Steidl & Powell, 2006). Birds are likely to react to human approach by changing their behaviour, however briefly, or displaying flight reactions or an increased heart rate. Even though these responses can be brief, they nevertheless can lead to worrying changes in the long run, such as when flushed-out breeding birds are leaving their eggs or chicks, making them easily attackable by predators (Guillemain et al., 2007). Areas frequently disturbed by humans are likely to suffer reductions in both their breeding performance and the quantity of the available nesting sites, leading to severe population reduction in the long term (Pearce-Higgins, et al., 2007). Although it is not easy to establish a direct connection between disturbances of human origin and population level effects, a hierarchical model can be used to demonstrate the relative importance of a negative effect, whereby the significance of an effect will vary in ways dependent on the scale of the disturbance itself (Steven et al., 2011).

As it has already been noted, research relevant to these issues from many parts of the world is grossly insufficient. Entire continents and vast nations have been studied extensively, such as Europe and most of the American continents. In contrast, research of Australian, Asian, Africa and Central American origin is close to non-existent. Despite the fact that three Eco-zones – Afro-tropical, Indo-Malayan and Australasian – have high bird species richness, there was only one paper investigating the effects on the avian life in the Afro-tropical eco-zone. This paper was concerned with South African shorebird breeding performance; Obviously, there is still much work to be done (Baudains & Lloyd, 2007).

Many areas with high bird diversity make nature-based tourism or bird tourism important parts of their economies, such as various southern and eastern African countries (Lindsey, et al., 2007). The Eco-zone of Indo-Malaya had only a single paper examining the developments of the tourism affecting the habitats of Malaysian plovers in the nation of Thailand (Yasué & Dearden, 2006). The region of Australasia produced only five papers of New Zealander origin, and a single paper of mainland Australian origin (Steven et al., 2011).This single Australian study was about Sydney, the largest city, and how there had once-abundant birds have reduced their activities and presence in the forest trails most utilised

by human walkers and their dogs on the outskirts (Banks & Bryant, 2007). This is surprisingly restricted considering that Australia is a hotspot for bird biodiversity that has been recorded to have over 800 avian species, such as honeyeaters and endemic parrots. It is also a country where nature-based recreation can be considered popular (Jones & Nealson, 2005). Research about the impacts of non-motorised recreation on significant foraging guilds of birds like frugivores and nectarivores is also extremely lacking, with only a paper concerned with the impacts on these guilds. Considering the sheer importance of nectarivores and frugivores and their roles in the ecology of numerous communities, for both the dispersal of seeds and pollination, this seems to be a significant oversight. (Moran, et al., 2009; Steven et al., 2011).

According to Green and Jones (2010) both local and international literature, and furthermore interviews with Australian governmental conservation agencies, show many problems with wildlife tourism both actual and potential problems. These problems are already afflicting the welfare and the behaviour of wildlife, along with reducing their populations. It is possible to categorise these negative effects into three distinct groups: the disruption of wildlife activity, the direct harm or killing of wildlife, and the alteration of habitat, which would include providing the animals with food. Depending on the species, the stages of the life-cycle, the habitats and numerous other variables, the severity and the magnitude of negative effects can vary widely in many ways (Green & Higginbottom, 2001). Bird-watching studies are necessary to assess accurately both the positive and negative effects of bird-watching on the birds and wildlife in the areas where bird-watching takes place (Darryl N, et al, 2001; Jones & Nealson, 2005)

Management processes that identify potential and actual negative effects and implement actions to correct them are critical. Monitoring of wildlife that could be affected by wildlife tourism activities should incorporate well established statistical principles where possible. There are also many gaps in knowledge that we would ideally possess if we are to manage wildlife tourism in such a way as to minimise negative effects on wildlife (Green & Higginbottom, 2001). According to Buckley (2012), if our intention is to use tourism as a conservation tool, we must study the behaviour and psychology of tourists as well as wildlife. Gaining knowledge of both tourists and wildlife is a prerequisite to successfully altering tourist behaviour in a positive way that leads to the satisfaction of all concerns.

4. Behaviour

The key objective of psychology is to recognise what determines people's behaviour, including understanding, explaining, and changing human behaviour. One principal purpose of environmental psychology is to understand what determines people's actions concerning environmentally related domains. Several different ways to determine action have been recommended through the field's review. Many of them could be classified under the general term "action models" or "action determination models". The theory of planned behaviour (TPB), [see, e.g., Ajzen, 1991] was confirmed to be mainly beneficial in the dominion of environmental actions (Klöckner & Blöbaum, 2010).The target behaviour should be defined carefully regarding its target, action, context and time (Frnacis, et al., 2004).

5. Disturbance Behaviour

The concept of disturbance behaviour might be unclear because disturbance is commonly related, and frequently blended, with the most general concept of perturbation. The definition by Boere and Zegers' (1975) for disturbance is "any situation in which an animal behaves in a different way from its favoured behaviour". Some authors only reflect on the human-produced part of disturbance, which is then defined as any condition in which human activities lead animals to behave differently than they would have in the absence of these activities.This paper focuses on birdwatchers' disturbance behaviour on birds with considering the categorisation by Green and Higginbottom (2001) regarding negative human impacts (human disturbance behaviour) on wildlife.

6. Categories of disturbance behaviour

There are many possible ways to group the negative effect of recreationists on wildlife. Those ways that take the response of the animal into account (habituation, avoidance, etc.) pose particular problems. These reactions, though undeniably vital to a thorough evaluation, are often unclear or unpredictable, and animals are capable of responding in several different or unknown ways. Grouping information according to the variety of disturbance can be, for the current purposes of this study, a less ambiguous method. The three categories used in this paper for disturbance

behaviours on birds are. 1. Disruption of the activity of animals, including using spotlights for birding at night, making noise by participating in large groups, keeping wild birds in cages and approaching birds for photography. 2. Intentional or accidental killing or injuring of animals, including killing wild birds (even for research), hunting, collecting or catching birds or trampling the nests of birds. 3. Habitat alteration, including feeding birds.

These definitions would cover most of the negative effects that possibly afflict wildlife. These are connected to three disturbance levels: 'interruption of tranquillity' (animals smelling, hearing or seeing humans but not making direct contact with them), 'interference with rights or property' (the clearance of habitat and similar disruptions) and 'molestation' (fishing, hunting, vehicular collision, etc.) (Green & Higginbottom, 2001). This study, however, diverges to a small degree by considering that the intentional or accidental feeding of animals falls under habitat alteration, and by not attempting to judge the levels of severity of the three levels of disturbance. For example, habitat clearance, when compared to hunting that is well managed, has a higher likelihood of killing many more animals.

Any noisy activities, spotlighting and tourists coming close to animals that are looking after their young or foraging can be considered other examples of disrupting activity. In response to the human disruption of wildlife activities, the animals may show some possible behavioural responses. The animals could react and display avoidance behaviour where the wildlife would flee or hide, or they could be already habituated to humans, having acquired a significant and regular lack of response to the human presence to the point of apparently disregarding their presence. Even worse, the animals could be attracted to humans and move towards them expecting to be fed. Some factors can influence the degree to which an animal will probably be affected by the activities of humans. Examples of such factors are the nature of the activity of the animal, whether or not it has dependent offspring, the quantity and type of past human contact, the openness of the habitat, the degree of which human activity can be predicted, and the methods of transport used by the visitors.

Human intentions may lead to wildlife destruction, such as collecting, fishing, or hunting; unintentional forms of death or injury to animals can also take place due to road accidents. Wildlife ecologists familiar with both the animals in question and the practices of collecting, fishing and hunting should be consulted to create thorough. Reasonable regulation that would allow souvenir sellers, tourists, or any other humans involved in wildlife tourism ventures to engage in these activities in ways that would not excessively harm or severely damage the wildlife population in the area. The human presence is also often responsible for the destruction of wildlife in other ways, such as crushing wildlife underfoot through unintentional trampling (e.g., the eggs belonging to birds that are ground nesting), the intentional killing of animals for perceived security reasons, (e.g., snakes), intentional insecticide use for human comfort, and intentionally setting fire to the forest understory to make firebreaks (particularly when it is breeding season). Obviously, the clearing or severe modification of land to create the infrastructure required for tourism activities is an extremely severe form of habitat alteration, given that, at the very least, it will displace wildlife populations inclined to dwell or pass through those areas.

Additional habitat alterations can be caused by humans trampling on vegetation, or from off-road vehicle damage. Another form of habitat alteration that has to be kept in mind is the possibility of both intentional and accidental provision of food to wildlife. Such changes can lead to significant fluctuations in population numbers, reduced protection from the weather or elements, increased vulnerability to predation, or the dwindling of available prey species. The marked increase in numbers of any single species might potentially lead to negative impacts on the other species that can be found in the ecosystem. There is a real possibility of animals that are used to being fed by hand becoming aggressive towards humans or otherwise posing a threat to tourists. It is not remotely easy to determine the magnitude of impacts or designate them as positive, negative or neutral. There are many complex variables to bear in mind, as what can be considered positive for the welfare of one species may be regarded as only neutral or negative for another species (or for the well-being of the ecosystem). Something found positive in an ecological sense could be negative regarding the effects on species' behaviour. The goals of human activity also shape the assessment of impacts, such as, which is considered more important: the possibility of approaching the animals or the display of their natural behaviour? The method used to approach the animals and any other activities transpiring at the exact site are additional, important factors to take into consideration. Even species that are only indirectly involved in wildlife tourism can be affected or changed by human activities. It is possible for management actions regarding wildlife tourism to lessen or diminish the adverse impacts of tourism on the wildlife itself. These activities can be focused on either the tourists or the wildlife, using many possible methods to alleviate the harm. In the majority of cases, it is considered appropriate to focus on the management of the visitors, as well as the tourist operators, regarding their distribution both spatially and temporally, numbers, behaviour, attitudes and their expectations (Green & Higginbottom, 2001). To Sum up, This paper defined disturbance behaviour on birds in the scope of the categorisation by Green and Higginbottom (2001) regarding negative human impacts (human disturbance behaviour) on wildlife.

7. Summary of the review

It is drawn from the consideration of both natural and social science studies that there is no direct measurement instrument for the assessment of disturbance behaviour on wildlife (birds) via leisure activity, specifically bird-watching. The available measures are all ecological/biological approaches. Considerably, less work has been carried out on the social dimensions of recreational disturbance, particularly bird-watching. Thus, it is necessary research for the presentation of a new, valid and reliable conservation instrument that may assist conservation planners in integrating psychosocial research techniques into the model for conservation planning. There is also a need for an attempt to identify the key factors influencing birdwatcher intentions towards disturbance behaviour on birds among birdwatchers. Consequently, these attempts in future research lead to introduce a predictive model for tourist behaviour to support conservation planning.

8. Conclusion

If bird-watching is to be a sustainable leisure activity in the long-term, more research is necessary for management to monitor the effect of wildlife tourism, especially bird-watching on birds. There is an essential need to study tourist behaviour if we would like to use tourism as a conservational tool. Developing new instruments and introducing new valid models for determination of useful factors on tourist behaviour towards disturbance behaviour on wildlife would be the helpful tool for conservation planning in wildlife management.

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RELATIONSHIP BETWEEN ATTITUDE, SUBJECTIVE NORM AND BEHAVIOURAL CONTROL AND VISITORS' PASSIVE ANTI-LITTERING BEHAVIOURAL INTENTION INSHAHID ZARE FOREST PARK, IRAN

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ABSTRACT

Monotony of industrial life takes the individuals to the stage of instability and bored forcing them to seek an alternative to releasing their emotion and returning back to the balance stage of living. As a result, besides the impacts that rooted in industrialisation, visits by individuals in the natural area for the purpose of relieving from routine life's pressure introduce additional negative effects. This issue encourages managers and stakeholders to design approaches to reduce negative impacts. However, the effectiveness of their approaches has been questioned in terms of durability and efficacy. In the current study, we try to identify underlying factors that seem vital to fill the afore mentioned gap via using the theory of planned behaviour (TPB). The relationships between attitude, subjective norm, and perceived behavioural control and passive anti-littering behavioural intention of ShahidZare Forest Park (SZFP)'s was examined. TPB questionnaire was modified and distributed among 550 SZFP's visitors. The contribution of TPB predictor variables to determine the variance in visitors' intention to perform passive anti-littering behaviour was assessed. Finding showed that subjective norm by predicting 43% [$\beta = 0.43$, $p < 0.01$] of variance in visitors' intention to perform passive anti-littering behaviour is the most influential variable, followed by perceived behavioural control [$\beta = 0.34$, $p < 0.01$] and attitude [$\beta = 0.12$, $p < 0.01$], respectively. Generally, in conjunction with previous studies, TPB showed to be an applicable theory in the field of the pro-environmental behaviour. Eventually, the outcome of the study can lend efficient information to the SZFP's managers to develop messages that are grounded in prominent beliefs of SZFP's visitors toward passive anti-littering behaviour.

Keywords: Passive anti-littering behavioural intention, attitude, subjective norm and perceived behavioural control.

1. Introduction

1.1. Background

With the advancement of the technology and mechanisation of the industry individuals' leisure has been expended. Eventually, the number of the individuals who are referred to the nature area to reduce their tension and frustration is rising (Martin, 1981; Cui, et al., 2016;). Although the number of the visitors' increment can create job opportunities and increase the local community revenue, it is not without its negative consequences such as conflict, nuisance, noise, littering, soil erosion, trampling of the flora and altering wildlife regime, changing the local community culture, vandalism, etc. These are the terms, can be classified under the depreciative behaviour. For two reasons, depreciative behaviour must go under the thoughtful consideration. First, even though tourism and recreation (especially nature-based and ecotourism) can impose negative consequences on the environment, they are both dependent on the environment and its sustained quality (Harris & Leiper, 1995; Markwell & Weiler, 1998; Buckley, 1999; Mathieson & Wall, 1982; Cosma & Pargaru, 2016; Najafi, et al., 2016; Riasi & Pourmiri, 2016). In other words, visitors' experiences will deteriorate in an environment with degraded natural quality. Also the site's capability to attract visitors lessens (Pigram, 1980; Hillery, et al., 2001). Therefore, it seems essential to protect natural areas from disordered behaviour and depreciation that helps to sustain nature recreation industry. Secondly, most of the individuals' visits to the recreational area occur in the fragile and irreplaceable sites (Wall, 1994; Weaver, et al., 2000). Additionally, humans' impact that appears to leave no significant trails in more resistance area may lead to a severe effect on less resistance and sensitive sites (Cohen, 1978; Newsome, et al., 2002).

One of the most prevalent and neglected kinds of the non-environmental behaviour, which is mostly performed by individuals who are visiting in the natural area is littering. Littering is an undesired behaviour, which is socially and environmentally problematic. Most individuals conceive littering as untidy that could harm humans and wildlife's health.

It should be considered that litter and littering are different. While littering refers to the act of the incorrect and unplanned materials disposal, which is assumed as a most prevalent and neglected kind of the environmental damage (Finnie, 1973; Hansmann & Scholz, 2003), litter refers to those materials which are discarded and spread in the specific setting. Litter consist of the wide range of the materials from cigarette butts as a small object to abandoned vehicle as a large item (Arafat, et al., 2007; Schultz, et al., 2011). Based on the setting and the time interval between litter production and its disposal, littering can be classified as passive and active. For instance, due to the long time interval between the litter production in the picnic area and the moment individuals vacate the site, littering behaviour has a passive notation. Whereas, the time interval between litter production and leaving the area for those involving in the activities in trail site is short, presenting active littering behaviour. Besides, littering in the field such as trail is more observable than litter production in the area such as a picnic site, making littering behaviour more prevalent in picnic site. In the other words, active littering is more observable than passive littering. Another reason that can be considered as an element, incrementing occurrence of littering in picnic site is an ownership sensation toward occupied setting. Peripherally, the long time interval between occupying, and vacating the picnic site may increase the littering probability owning to individuals' weakness to recall their littering production(Sibley & Liu, 2003).

Iranian Forest parks, especially those located in the north of Iran, are one of the main sources of the recreational activities, which annually meet a huge amount of the visitors. For instance, Sisangan and Saeidi Ashtiani Noor Forest parks received about two million visitors annually (Salahvarzi, 2011). Although, it could be helpful in terms of providing new job opportunities and improving the primary sources local communities' economic status, this massive and unsupervised visits violate Forest Parks' carrying capacity which, leads to serious problems such as littering, user conflicts, reducing the Forest Parks' attraction, contaminate the environment, which jeopardises visitors' wellness, soil compaction, vandalism, and alter wildlife's regime (Salahvarzi, 2011). Forest Parks in Mazandaran Province have faced enormous quantity of litter for years, leaving both Forest Parks' visitors and managers with a huge problem. As stated by Salahvarzi (2011), the huge amount of domestic and international visitors brought extensive quantity of litter. Based on the author's personal observation and interviews with ShahidZare Forest Park's managers, the prevalence of litters because of littering behaviour and another kind of the depreciative behaviour had been detected.

1.2. Problem Statement

Enormous numbers of the researchers have tried to develop management approaches to alleviate the littering issue in the recreation areas. Nevertheless, the efficacies of these approaches are under scrutiny owing to their limitation to only manipulate the overt behaviour rather than underlying variables, which are assumed to ground individuals' decision-making process. Variables such as values, beliefs, attitude, and norms essential for long-standing behavioural change were disregarded (Ham, 1992; Roggenbuck, 1992; Moore, 1995; Manning, 2003;). For instance, due to management intervention deficiency to eliminate a littering problem in the Iranian Forest Park, the litter prevalence enforces government and private sectors to spend vast amount of money annually. Therefore, developing new methods that can fill the gap of the previous researches leading to durable behavioural changes appeared to be vital. Based on the literature few variables can be mentioned as determinant elements to profoundly change littering behaviour in recreation areas, namely attitude, subjective norm, perceived behavioural control, and intention. Variables that are core constructs in the theory of planned behaviour (TPB), which was developed by Ajzen(1991a). Based on TPB (Ajzen, 1991a), the immediate antecedent of behaviour is individuals' intention toward concerned behaviour which also mediates the effect of the individuals' attitude, subjective norms, and perceived behavioural controls on target behaviour. Attitude is defined as the degree of favourability and un-favourability of the target behaviour based on the individual evaluation of that behaviour. Subjective norm is another exogenous variable embedded in TPB, which refers to the individuals' perception of approval, or disapproval that their relative importance may express about their action. The final core variable that presented in TPB is perceived behavioural control refers to individuals' perception of their capability to perform the target behaviour and the factors that facilitate or impede the performance of the target behaviour (Ajzen, 1991a).

The purpose of our study is to examine the efficacy of TPB to predict SZFP's visitors' intention to perform the passive anti-littering behaviour. Additionally, the effects of each independent variable (i.e., attitudes, subjective norm, and perceived behavioural control) on the visitors' intention to perform passive anti-littering behaviour were determined. The study research questions (RQ) were initiated to fulfil the purpose of the study.

RQ1: Whether the relationship between attitude (instrumental and affective) of SZFP' visitors towards their passive anti-littering behaviour and their passive anti-littering behavioural intention is significant?
RQ_2: Is the subjective norm (in-group and out-group) of SZFPs' visitors towards their passive anti-littering behaviour significantly related to their passive anti-littering behavioural intention?
RQ_3: Is there any significant relationship between perceived behavioural control (controllability and self-efficacy) of SZFPs' visitors towards their passive anti-littering behaviour and their passive anti-littering behavioural intention?

The study research objectives were developed to answer the study research questions. The main goal of the study is to determine the efficacy of TPB to predict SZFP's visitors' intention to perform passive anti-littering behavioural intonation. Additionally, in our study, we tried to determine the effects of each independent variable, including attitude, subjective norm and perceived behavioural control of SZFP's visitors toward passive anti-littering behaviour on their intention to perform passive anti-littering behaviour during the time they are exercising in SZFP. These are the research objectives that were introduced in this study.

RO_1: To determine the relationship between attitude (instrumental and affective) of SZFPs' visitors towards their passive anti-littering behaviour and their passive anti-littering behavioural intention.
RO_2: To determine the relationship between subjective norm (in-group and out-group) of SZFPs' visitors towards their passive anti-littering behaviour and their passive anti-littering behavioural intention.
RO_3: To determine the relationship between perceived behavioural control (controllability and self-efficacy) of SZFPs' visitors towards their passive anti-littering behaviour and their passive anti-littering behavioural intention.

1.3. Significance of the Study

The result of this study could help Iranian Forest Parks' managers to have a profound understanding of factors that ground Forest Parks' visitors decision-making process. Consequently, by having a deeper understanding, Forest Park's managers can design precise messages effective enough to persuade visitors to perform a passive anti-littering behaviour for a long term. The findings should make an important contribution to the field of recreation resources management by drawing the attentions of the involved sectors, such as Iran Touring & Tourism Investment Co ITTI, Handicrafts and Tourism Organization, Cultural Heritage, and Department of Environment to consider the influential elements before implementing their management strategies to counter with littering problem in Iranian forest park. This study also provided an important opportunity to advance the understanding of some features of pro-environmental methods to face littering issue for students and social researchers.

2. Materials and Methods

2.1. Study Design

The descriptive study was chosen as a method of the survey research, owing to the large population size. One of the best methods to directly observe the large target population is survey study, which provides the researchers reliable knowledge to describe target population. In the other words, a large population can be well characterised by using a precise sampling. Additionally, the best way to assess variables such as attitude in a big population is using survey method (Babbie, 2007).

2.2. Setting

ShahidZare Forest Park (SZFP) was selected as a case study, which is located in Mazandaran province. ShahidZare Forest Park with an area more than 70 hectares is located in the south-east of Sari city with the 53˚07´9˝longitude, 36˚32´34˝latitude, 36˚32´57˝north and 53˚07´57˝east (Fig. 1). Alborz Mountains' forested hill is in the vicinity of SZFP, which adds spectacular perspective to the Park. Additionally, the park provides day and overnight visitors with efficient facilities such as picnic site, trail site, and shelter. Besides local users, the proximity of the park to the road, which is the main connection between the religious city of Mashhad and other cities including Tehran metropolitan, which increases the number of visitors choosing the park as a resting area. This park was established in 1980 and is currently under the private sector management.

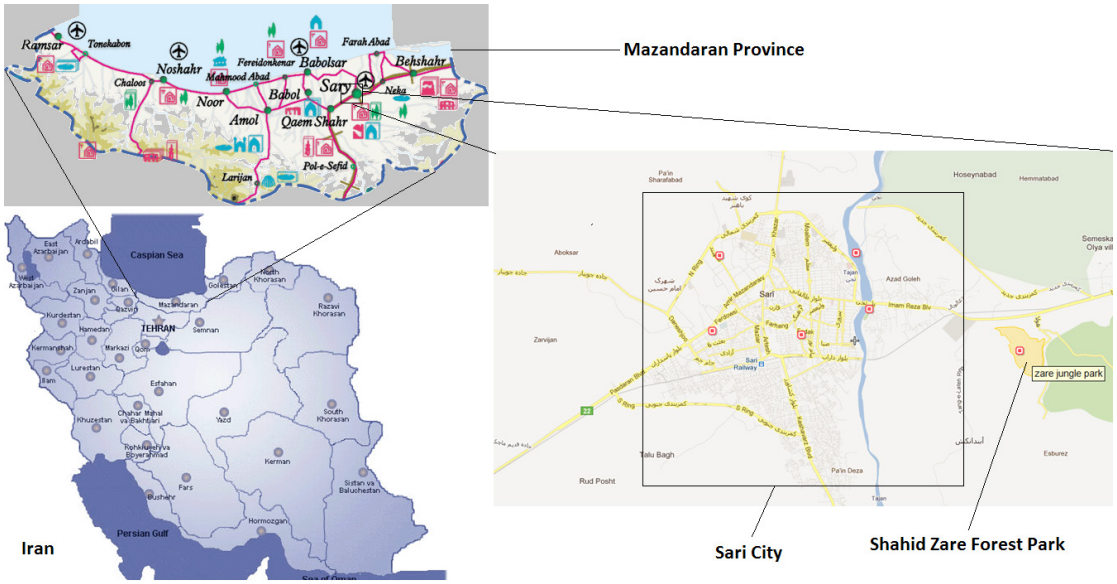

Figure 1: Location of ShahidZare Forest Park in Sari City
Source: Google Maps, 2016

3. Sampling Procedure

The sampling procedure took two steps. First, the target Forest Park was chosen through a simple random sampling from the eight Mazandaran province's forest parks (i.e. ShahidZare Forest Park, Saeidi Ashtiani Forest Park, Mirza Kouchak Khan Forest Park, Emamzadeh Abdullah Forest Park, Telar Forest Park, SiSangan Forest Park, Chalous Forest Park, and SiSara Forest Park) which were identified by the Department of Natural Resources and Watershed Management of Mazandaran province. Owing to the similar qualitative and quantitative condition of the parks' facilities, the number of the visitors, and the presence of the littering problem, ShahidZare forest park was randomly chosen from the eight different Forest Parks. Second, via systematic sampling, 550 self-administered questionnaires were distributed among the visitors of SZFP. Due to the detailed instruction about how to answer the questions, which were provided on the cover letter of the questionnaire, respondents could answer the question without the researcher's assistance. Also, information about the purpose of the study (i.e. how individuals feel about certain environmental-related issues) and the principle of anonymity of respondent was added in the cover letter.

Date collection began after receiving the admission form SZFP's manager. It lasted for one month beginning on the first of May 2011. A total of 550 questionnaires were distributed among the visitors on four weekends. Weekends were chosen rather than weekdays because Iranian population is indeed young and during the weekdays most of the people spend majority of their time in schools and universities. Therefore, collecting date during the weekdays could not sufficiently represent the whole target population. Of the 550 questionnaires, which were distributed among the respondents, 450 were filled up, leaving almost 100 unusable. Of 450 filled up questionnaires, 50 were eliminated due to the missing values leaving 400 questionnaires for data analysis. Valid responses were almost 88.8%, and according to Babbie (2007) the percentage is adequate enough for data analysis (i.e. response rate between 60% to 70%).

4. Data analysis

For the purpose of the data analysis three different statistical methods were used namely descriptive analysis to describe demographic characteristic target population and dispersion of responses by respondents, correlation analysis to estimate the relationship among the study's variables, and multiple linear regression to examine the effect of the independent variables on dependent variables, both individually and jointly (Siegel, 2003; Kline, 2005; Howell, 2007). Using One-Sample Kolmogorov-Smirnov (p-value of 0.0001), the indices of the study (i.e., attitude, perceived behavioural control, subjective norm, and behavioural intention) were exposed to normality test prior to scrutinising the objectives of the research. Results of the normality test supported the normal distribution of the data. In addition, based on the result of exploratory analysis the variables of the study's kurtosis and skewness were between -1 and +1, which again confirmed the normal distribution of the data. To assess the predictor variables' multicollinearity in the domain of multiple linear regression analysis and to specify an indicator that estimates the extend of the study's assessed regression coefficient were affected by collinearity phenomena, the Variance Inflation Factor (VIF) was utilised (Samprit, et al., 2006). The test result showed that there is no multicollinearity effect between predictor variables. The VIF values related to predictor variables were below 5 percent (Table 1).

Table 1 Multiple regression coefficients for IVs

	B	β	p	VIF
V_1	0.088	0.087	0.03	1.179
V_2	0.520	0.403	0.00	1.392
V_3	0.364	0.315	0.00	1.374

V_1 – Attitude
V_2 – Subjective norms
V_3 – Perceived behavioural control

5. Results and Discussion

5.1. Correlation analysis

The results of the correlational analysis showed that attitude and passive anti-littering behavioural intention were significantly correlated [r=0.08, p<0.01]. It means if the visitors' attitude toward performing passive anti-littering behaviour increased, their intention would slightly increase. The finding supports the first objective of the study. Due to the collectivist nature of the Iranian society on one hand, and voluntary characteristic of passive anti-littering behaviour in Iranian Forest Park, it can be assumed that the target behaviour is mostly affected by social pressure rather than individuals' attitude, which may explain weak relationship between attitude and behavioural intention. Another reason that could be effective in a low relationship between attitude and intention was the incompatibility error that might occur in the study. The measures of attitude toward performing anti-littering behaviour during the time visitors are inside the forest park may not be compatible enough in terms of the target, action, context and time with their intention (Ajzen & Fishbein, 1980).The incompatibility issue could decrease the size of correlations. However, as the sample size of the study was quite large (400 respondents), a small correlation was said to be still statistically significant (Baker, 1999). Despite the low relationship between attitude and intention to perform a passive anti-littering behaviour, majority of the forest park visitors showed a positive attitude towards performing the passive anti-littering behaviour. Based on the means rankings, it can be notified that visitors emphasised on the usefulness and profitableness of target behaviour, which represented the instrumental attitude. However, forest park visitors inclined to stress that the target behaviour was bad and unpleasant, which represented the affective attitude.

The second objective of this study tried to determine the relationship between the subjective norm of the forest parks' visitors to performing anti-littering behaviour and their intention to perform anti-littering behaviour during the time they are inside the SZFP. The result of the study showed that there was a positive strong correlation between subjective norm and intention to perform passive anti-littering behaviour [r=0.59, p<0.01]. It means that if the relative important such as families, friends, parks' other visitors and employees support the visitors' decision to perform the passive anti-littering behaviour, the probability that visitors perform the passive anti-littering behaviour (when they are vacating forest parks' picnic site) would increase. The finding supports the study's second objective. Additional analysis revealed that

subjective in-group norm (i.e. family and friends) has a higher correlation [r=0.60, p<0.01] than the subjective out-group norm (i.e. Forest Park's other visitors and management) [r=0.41, p<0.01] with visitor intention. The respondents reported that their families were the most important people who expect them and think that they should perform anti-littering behaviour based on frequency rankings. Most of the visitors in the current study came to the forest park with their family. In Iranian culture, family plays a vital role. Therefore, it is natural that respondents of the study could be mostly affected by their families' ideas related to performing anti-littering behaviour than Forest Parks' employees and other visitors. However, the role of the Forest Park's employee was still prominent who was the representative of the out-group subjective norm. According to Blake and Davis (1964), there are three different kinds of sanction, which are the formal sanction imposed by agents for an organisation or agency, the informal sanction imposed by other persons, and self-sanction imposed by one's self. Therefore, the possible reason why forest parks' visitors ranked forest parks' employee as a second most important person is the probability of forest parks' employees' authority for formal sanction. Finally, the respondents of this study identified forest parks' other visitor as a last important person based on the frequency rankings. The plausible reason with respect to sanction classification (Blake & Davis, 1964) is that forest parks' other visitors could be classified among those people whose the rewards of a smile and approving nod, a sympathetic silence, or a spoken praise, or the punishments of a contemptuous glance, a derisive laugh, or a spoken rebuke is considerable.

The third objective of this study was to determine the relationship between perceived behavioural control of the forest parks' visitors related to performing the anti-littering behaviour and their intention to perform anti-littering behaviour during the time they are inside the forest park. Study finding showed that perceived behavioural control was positively and strongly correlated with passive anti-littering behavioural intention [r=0.54, p<0.01]. It means that by increasing visitors' perception of their capability and doability of the target behaviour, their intention to perform anti-littering behaviour would increase. The finding supports the third research objective. The results showed that the more forest parks' visitors believed that they could control the resources or opportunities, the more they intended to perform the anti-littering behaviour. It seems visitors perceived the performance of anti-littering behaviour in picnic sites to be less difficult and they believe they could perform this behaviour, which received its' credibility from the passive characteristic of the recreation activities in picnic site. In other words, visitors to picnic site usually vacate the place at the end of their recreation activities. Therefore, the act of anti-littering behaviour encounters with less limitation. The additional finding revealed that visitors' confidence in their abilities to succeed in a task would help them to develop constructive beliefs and assumption, and consequently perform the anti-littering behaviour.

Table 2 Correlation analysis: relationship between all variables

	r	Frequency	P
Passive Attitude	.08*	400	0.08
Passive subjective norm	.59**	400	0.00
Passive perceived behavioural control	.54**	400	0.00

**. Correlation is significant at the 0.01 level (2-tailed)

5.2. Hypotheses testing

Multiple linear regression analyses were performed to determine the contribution of each predictor variables entered in the equation in relation to the dependent variables. The efficacy of TPB in predicting passive anti-littering behavioural intention was examined Attitude, subjective norm and perceived behavioural control were entered as independent variables to test TPB. The R-square, F value and p value of the predictor variables are shown in Table 3. Attitude, subjective norm, and perceived behavioural control contributed about 44% of the variance in intention to perform passive anti-littering behaviour (R2 = 0.44).

Table 3 Multiple linear regression coefficients

Model	IVs	R	R^2	Adjusted R Square	f	p
Model II (TPB)	Attitude Subjective norm Perceived behavioural control	0.67	0.44	0.44	105.57	0.00

The regression coefficients related to each independent variable are represented in Table 4.

All independent variables (i.e., attitude, subjective norm and perceived behavioural control) were found to be significant towards the intention to perform the passive anti-littering behaviour. The first predictor variable was subjective norm [$\beta = 0.43$, $p < 0.01$] followed by perceived behavioural control [$\beta = 0.34$, $p < 0.01$] as the second predictor of intention. Attitude was the weakest predictor of intention to perform passive anti-littering behaviour [$\beta = 0.12$, $p < 0.01$] (Table 4).

Table 4 Multiple regression coefficients for IVs

	B	β	p	t	sig
V4	0.22	0.12	0.03	3.21	0.00
V5	0.55	0.43	0.00	9.88	0.00
V6	0.39	0.34	0.00	7.87	0.00

V4 – Attitude in passive group
V5 – subjective norm in passive group
V6 – perceived behavioural control in passive group

The results of this study were consistent with Ajzen and Madden(1986) prediction of goal-directed behaviour that TPB significantly enhanced the prediction of behavioural intention [R square = 0.48 to 0.59]. In this study, TPB could explain 44% of the variance in intention to perform the passive anti-littering behaviour at $p < 0.01$ ($R2 = 0.44$). Furthermore, results of regression analysis showed that the subjective norm was the strongest determinant variable to predict the intention to perform the passive anti-littering behaviour. This reflects that the behaviour of the study (i.e., passive anti-littering behaviour) is under low volitional control. Empirical evidence has indicated that TPB could efficiently predict behavioural intentions (Madden, et al., 1992; Godin & Kok, 1996; Sheeran & Taylor, 1999; Armitage & Conner; 2001; Bamberg & Möser; 2007; Endrejat, et al., 2015;). It can be deduced that forest parks' visitors who intend to perform passive anti-littering behaviour were more likely to evaluate the behaviour positively, to believe that relative importance would approve the behaviour, and believe that they have control over performing the target behaviour and they confidence in their ability and capability to complete the behaviour successfully.

Regression equation:

$$PABI = 0.22 \times AT + 0.55 \times SN + 0.39 \times PBC - 0.06$$

6. Conclusion

To achieve long-term pro-environmental behaviour, forest park managers must identify the underlying values, attitudes, and beliefs of the forest park visitors prior to applying any kind of management approaches. This study found that the underlying values, attitudes and beliefs have a significant effect on visitors' intention to perform the passive anti-littering behaviour. The study's finding confirmed the efficacy of TPB to predict Forest Park visitors' intention to perform the passive anti-littering behaviour. Moreover, performing the passive anti-littering behaviour is not under individuals' full control. This confirmed that perceived behavioural control is a good predictor of intention for behaviour with low volitional control as proposed by Ajzen(1991b). Thus, prior to applying persuasive communication it seems appropriate to elicit Forest Park's visitors' beliefs that shape their attitude, subjective norm, and behavioural control toward passive anti-littering behaviour. Beliefs that could help Forest Parks' managers 1) to improve the quality of the messages that appear on interpretive signage; 2) to find out what are the contextual constraints, preventing individuals from performing the anti-littering behaviour and what are the contextual facilitators that could help individuals to perform pro-environmental behaviour easily. For example, based on finding of this study, self-efficacy is the first effective factor in picnic side followed by control factor. It could take the attention of researchers to the point that visitors believe they have high capability to perform the anti-littering behaviour in picnic site. Consequently, environmental manipulation could not be as effective as lightening important others' approval or disapproval about performing the anti-littering behaviour in picnic site via educational programmes and interpretative sign. 3) to determine the most important influential people in the particular population and particular context. For instance, this study found that individuals' families and friends (i.e., in-group subjective norm) are the most influential factors in their decision to perform the passive anti-littering

behaviour. Therefore, individuals can be referred to the reaction that may come with their non-environmental behaviour from their families and friends (i.e., informal sanction). Meanwhile, forest park managers are recommended to highlight and reinforce the role of forest parks' manager and employees as sources of formal sanction in their management approaches. 4) to identify individuals' knowledge about their behavioural consequences. It is important to specify these beliefs since it assists the managers to design intervention that built on the base of the visitors' own beliefs. It is expected that this strategy can increase the attractiveness and efficacy of the management approaches. For example, based on the results of this study, people who are spending their time in picnic area believe, it is useful to take their rubbish with themselves while they are vacating the area. Therefore, for those managers who desire to use indirect management approaches such as persuasive communication (interpretative sign and education programme), it could be suggested to add reliable information and knowledge about the positive effect of anti-littering behaviour in their intervention.

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TOURIST SATISFACTION ON THEIR VACATION AT PULAU LANGKAWI

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ABSTRACT

Pulau Langkawi is a well-known tourist destination both domestically and internationally as it has many attractions as it is full of natural and man-made resources making it an ideal tourism hot-spot of Malaysia. However, there is little documentation on the satisfaction level of tourists in Pulau Langkawi as a whole. This study focuses on the level of satisfaction among tourists based on their expectations and realization on five different domains which are accommodation, transport, safety, motivation and activities. To obtain data for this study, questionnaires were designed with expectation and realization statements based on the 5 domains which are accommodation, transport, safety, motivation and activities. The sample size of the study was 300 respondents. This study is based on the Expectation Disconfirmation Theory to find the level of satisfaction among tourists that flock the island. Based on this study, it is found that tourists are generally dissatisfied with their vacation experience even so; the level of dissatisfaction can be considered as low with a gap value of -0.10. Out of the five domains studied, the activity domain showed the lowest mean gap value of -0.32. This suggests that most of the tourists were not satisfied with the activities that are offered on the island. The results of this study can be used as a reference for the local authorities to carry out future improvements in maintaining the island in terms of tourism.

Keywords; Satisfaction, Expectation Disconfirmation Theory and gap analysis.

1. Introduction

Langkawi is an archipelago of 104 island situated off the east coast of Kedah, Malaysia. It is a well-known tourist destination of Malaysia and is also a duty-free island. The largest island of Langkawi is the eponymous Pulau Langkawi with a population of 64,792. According to Tourism Malaysia, most of the islanders are farmers and fishermen. Even so, due to its booming tourism sector, most of the islanders have shifted towards entrepreneurial. Most of them nowadays are recreational service providers that cater the needs of tourists that flock the island. On 1st June 2007, Langkawi Island was gazetted by the United Nations Educational and Scientific Organization (UNECSO) Global Network of National Geoparks as one of the first geoparks in Southeast Asia (Othman & Rosli, 2011).

Pulau Langkawi is an ideal tourist hotspot because it has many diverse attractions that could be offered to different types of tourists. The island is duty-free, has many beautiful beaches, has world class infrastructures, mangroves rich in flora and fauna and fascinating legends that could impress tourists. There are also many recreation activities in Langkawi such as eagle-feeding, scuba-diving, snorkelling, island hopping, shopping, and river-cruise. It can be said that Langkawi is an ideal tourist destination for eco-tourists and normal tourists.

There are many types of tourism in Langkawi. Among the prominent forms of tourism is beach tourism which can be seen in Pantai Chenang, Tanjung Rhu, and Pantai Tengah. There are nature tourism based in places such as Kilim Karst Geoforest Park, Pulau Dayang Bunting and Pulau Payar. Also, Langkawi offers some form of cultural tourism which can be observed at Beras Terbakar, Makam Mahsuri and so on.

Each year, according to statistics from the Langkawi Development Authority (LADA, 2014), the number of tourists, whether domestic or international, gradually increases. This shows that the island archipelago is gaining much attention internationally and locally as a holiday destination. However, there is no appropriate body or measures taken to monitor the satisfaction level of tourists in general, during their stay in Langkawi. General needs for a holiday include accommodation, safety, transport, activities and motivation. Furthermore, by studying the satisfaction level of tourists towards these factors, we could understand which factor is weak and requires attention by the responsible bodies. Hence by identifying tourists' satisfaction level, future planning and management can be undertaken properly.

The main objective of this study is to determine tourists' satisfaction at Pulau Langkawi based on expectation and realization on accommodation, transportation, safety, activities and motivation. The specific objectives of this study are to determine (1) the expectation and realization of tourists based on the 5 attributes; and (2) the socio-demographic of tourists at Pulau Langkawi.

2. Related Literature

2.1. Definition of Satisfaction

Satisfaction is defined as the fulfilment of one's wishes, expectations or needs, or the pleasure derived from this (Oxford Dictionary, 2014). Satisfaction is also synonymous with contentment, pleasure, gratification and happiness. User satisfaction is an important factor for many sectors and work areas today. This includes tourism, recreational sites, housing and so forth. According to Oliver (1980), satisfaction can be defined as a post-choice evaluative judgment concerning a specific purchase decision. However, in regards to tourist satisfaction, it can be argued that the attitudes, expectations and perceptions of the holiday-maker are significant variables in setting goals, influencing behaviour and determining final satisfaction (Ryan, 1995). This means to determine final satisfaction, we must study firstly, the expectations and perceptions of tourists beforehand.

Satisfaction involves both intellectual and emotional response. According to Kotler (2000), satisfaction is defined as "a person's feeling of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) in relation to his or her expectations". In addition, according to Zeithaml and Bitner (2000), satisfaction is defined as after-purchase evaluation and emotional recognition of the completed purchasing process. Toy et al. (2002) defined satisfaction as the positive perceptions or feelings which and individual forms, elicits or gains because of engaging in leisure activities and choice. It is the level to which one is presently content or pleased with her/his general leisure experiences and situations. This positive feeling of contentment results from the satisfaction of felt or unfelt needs of the individual.

Oliver (1981) proposed that consumer satisfaction is the summary psychological state created by the coupling of two sources of affect: the surprise of finding one's pre-purchase product-specific expectations disconfirmed by post-purchase experiences with the product, and one's pre-purchase feelings toward product-related experiences. Oliver describes satisfaction as a dynamic phenomenon, arising after expectancy disconfirmation and decaying over time into overall attitude toward the product. Oliver's conceptualization explicitly recognizes the affective character of satisfaction, as well as the focus of the concept on consumer experiences rather than the product per se (Westbrook & Reilly, 1983).

Olander (1977) noted that satisfaction is a relative concept, always judged in relation to a standard. This standard may be the individual's expectation as derived from earlier experiences (temporal comparison), the individual's achievement in other spheres of life (spatial comparison), or the perceived level of satisfaction other derived from leisure activities (social comparison). In another study, Sessoms (1975) stated that satisfaction includes feeling secure, being recognized belonging, accomplishing and creating as well as experiencing new adventure.

2.2. Factors affecting satisfaction

There are many factors affecting satisfaction. Fah and Kandasamy (2011), argued that satisfaction can be determined by subjective and objective factors. Subjective factors are such as attitudes, emotions, involvement and so on while objective factors include product, service quality, and features. This shows that satisfaction determinants are very broad due to its range of variables. However, there are many arguments about subjective factors being more significant factors when determining satisfaction. Ryan (1995) found that, in undertaking any study of tourist behaviour and attitudes several considerations must be addressed such as perceived importance of an activity, intervening variables such as skill, presence of significant others and so forth. With the understanding of attitudes, true satisfaction can be determined.

Meng (2006) stated that, it can be concluded that attribute importance, performance, and motivation serve as a function of measuring tourist satisfaction, and collectively influence the degree of overall satisfaction of a destination. Comparatively, destination attributes, especially the performance on quality and friendly service and lodging facilities, have more impact on tourists' mental perceptions of their visiting experience than the categories of attribute importance and their motivations. In other words, the level of satisfaction of tourist can be influenced by two important factors, namely, service quality and the quality of facilities.

In a study on the determinants of tourists' satisfaction by Nowacki (2013), it is found that the determinants of satisfaction can be divided into two groups which are subject-related factors and object-related factors. The subject-related factors include demographics of the respondents and their perceptions or interests. The object-related factors are such as the quality of an attraction.

2.3. Measuring Satisfaction

There are several methods to measure satisfaction level of an individual. However, the context should be suitable to who the respondents are. In this case, the respondents are tourists of a holiday destination. They have some similarities with users of a certain product for instance. Even so, to better suit the study, the expectancy disconfirmation theory was used as a basis for this study in which we would identify at first, the expectation and realization of tourists towards certain factors of the holiday destination. In this case, accommodation, safety, transport, activities and motivation factors were adopted. Pizam and Milman (1993) stated that the predictive ability of such models was found to be especially effective when the tourists' population was sub-divided into market segments based on reason for travel.

2.4. The Expectancy Disconfirmation Theory

The Expectancy Disconfirmation Theory as proposed by Oliver (1980) is widely used in business and tourism research. The theory conceptualizes four components which are expectations, realization, disconfirmation and finally satisfaction or dissatisfaction. In the expectation stage, user has different expectations of a certain product. This includes the level of knowledge of the product which in return leads to different estimation of product performance. The second stage, realization, is where the user develops their perception of the products performance after realizing or underwent the experience of the product. Disconfirmation happens when the realization of the user is compared to his/her initial expectation of the product. Satisfaction could then be measured when the perceived performance or realization is, whether or not, it is up to par with the initial expectation of a user. Figure 1 shows the Expectancy Disconfirmation Model as proposed by Oliver (1980).

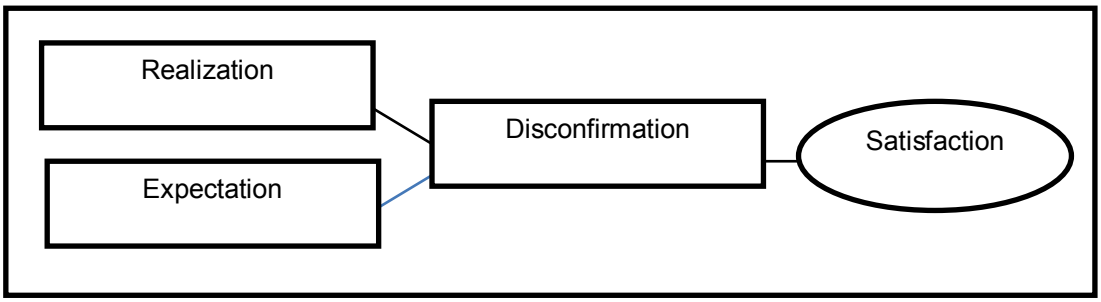

Figure 1 Gap analysis to measure satisfaction

According to Ryan (1995), if satisfaction is seen as the congruence of need and performance, then dissatisfaction can be perceived as the gap between expectation and experience. Therefore, some form of gap analysis might be helpful in analysing tourist satisfaction. Engel et al. (1986) defined satisfaction as the gap between products after being experienced by consumers and the expectations prior to consumers purchasing the products. If the product meets expectations, satisfaction is achieved. When the gap between the expectation and actual experience is significant, there will be negative feelings among customers (Lin et al., 2011).

Moreover, since the theoretical basis of this study is the Expectancy Disconfirmation Theory, the gap analysis model is the most suitable to measure tourist satisfaction in Langkawi. Based on the expectancy disconfirmation theory the formula for the analysis for this study is as follows; -

Satisfaction = Mean average of realization – Mean average of expectation

Importance of Studying Satisfaction

There is a vast number of studies involving satisfaction a psychological outcome either in hospitality, travel, recreation or tourism (Kozak & Rimmington, 2000) and is often associated with the result of expectation with realization or perceived performance (Korzay & Alvarez, 2005). Basically, it can be determined from the number of gaps between expectation and experience, expectations and perception or even expectations and realization (Zeithaml, et al., 1996). It is also known as the last stage in the psychological process of recognition to evaluation of experienced products

(Peter & Olson, 1996) or an overall evaluation or judgement of a purchase (Fornell, 1992; Oliver, 1997). Also, according to Sivalioğlu and Berkoz (2012), the best way to measure the performance of a recreational area or service industry is to conduct customer satisfaction surveys. This means that a service industry or park performance could be effectively measure through the feedback of customers.

There have been many previous researches that stresses on two main importance; repetition of product or service and promotion to a third party either direct or indirectly (Hallowel, 1996; Kozak & Rimmington, 2000) other than its significant effect towards profit or rapid growth in market share. Satisfaction creates a positive image on the service and product and insures the customer's loyalty essential for business growth. By having a positive image, the service or products will most likely have a high probability to be referred to friends and family and it may help in popularity growth.

Tourist satisfaction is a key factor for a successful holiday destination. Satisfaction instigates the possibility of a revisit and determines the experiences the tourists have during the visitation. In terms of marketing, on the other hand, a satisfied tourist means that he/she will come back again, or prolong his/her visit or encourage others to visit the same place.

3. Methodology

This study was conducted at Langkawi's main island in the month of April 2015. Questionnaire survey was handed out to 300 respondents. The survey was done during the non-peak season where there were lesser tourists on the island. This is done to avoid bias in terms of respondents' socio-demographics and answering behaviour.

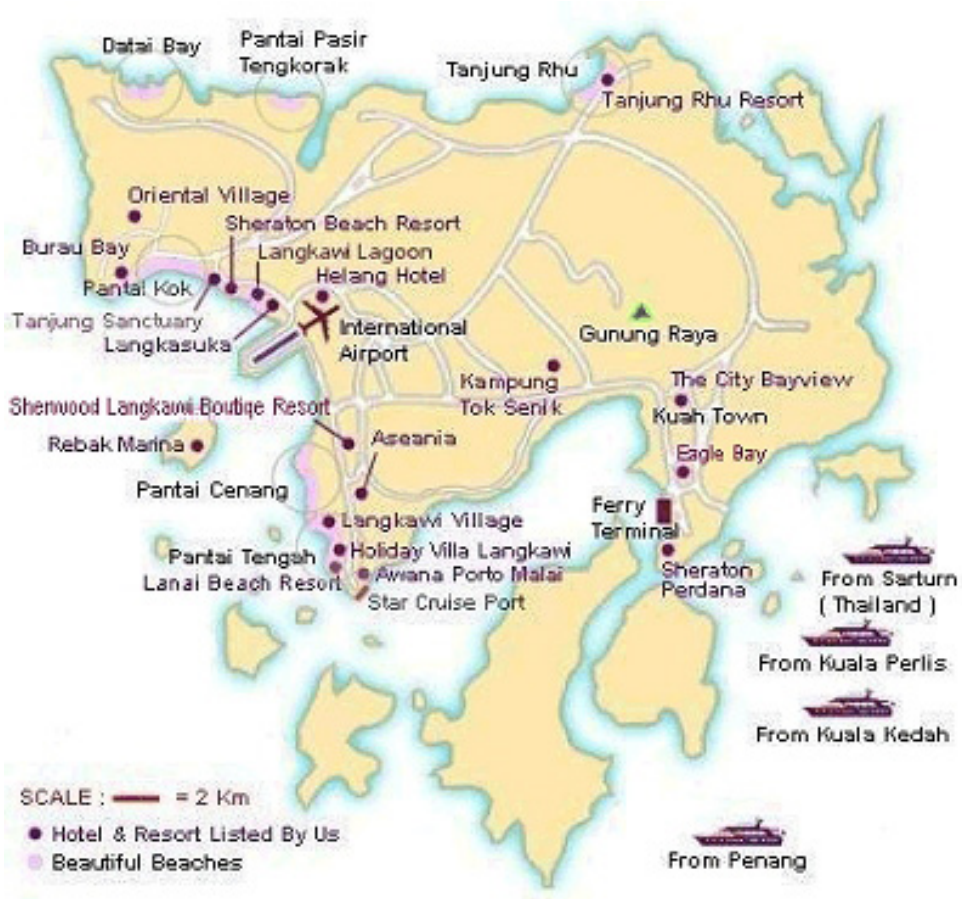

Figure 2 Map of Pulau Langkawi (Main Island)

The respondents of this study were selected using judgemental and purposive sampling technique. This is to ensure that the respondents are suitable for the study. They should be genuine tourists and not locals or businessmen. Only respondents above the age of 18 were selected to answer the questionnaire because they could understand and make decisions on their own better.

A pilot survey was conducted prior to the actual survey. The main purpose of the pilot survey was to test whether the questionnaire design was suitable in terms of length and layout as well as the feasibility of the sampling procedure. Changes and improvements were made to the questionnaire after the pilot survey was conducted.

A questionnaire was developed containing three sections. The first section contains statements designated to obtain tourist expectations prior to their stay in Pulau Langkawi. The next section contains statements about tourists' realization towards their stay in the island. The expectation and realization statements are based on general statements regarding the accommodation, transport, safety, activities and motivation of their visit. These both sections require respondents to give a score for each statement by using a five-point Likert-Scale, ranging from 1 to 5. The 1 to 5 score denotes in respective, "Completely Disagree", "Disagree", "Fair", "Agree" and "Completely Agree". The third section contains questions regarding respondent's profile.

4. Data Analysis

In this study, there were three types of analysis and one type of testing used. The analyses used in this study were descriptive statistical analysis, gap analysis and Expectation vs Performance grid (EPA) analysis. The test used to determine the reliability of the survey is the Cronbach's Alpha.

4.1. Descriptive Statistical Analysis

The descriptive statistical analysis is used to describe the respondents' socio-demographic characteristics which were gender, age, occupation, nationality, marital status, education level and salary. The descriptive analysis provides us with a profile of the sample that is not immediately available from the row data through frequency distribution. Frequency distribution is tables that summarize the distribution of variables by reporting the number of cases contained in each category of the variable.

4.2. Gap Analysis

The gap analysis model was used to measure the level of satisfaction. It has been the most popular model to measure service quality and was proposed by Parasuraman et al. (1985). This study uses the difference between the expectation and realization of tourists towards different attributes or factors to calculate the level of dissatisfaction. Theoretically, if the expectation score is greater than the realization score, it means that tourists are dissatisfied. If the realization score is greater than expectation, there is satisfaction among tourists.

5. Results and Discussion

5.1. Socio-demographic profiles among tourists

Identification of socio-demographic profiles of tourists is very useful to serve them better. In detail, with proper understanding of tourist profiles, marketing strategies, planning and management exercises can be simplified.

The number of respondents who took part in this study was 300. They consist of both international and domestic tourists. The data collected is shown in Table 1.

Table 1 Tourists' Socio-demographics

Characteristics		Frequency	Percentage (%)
Gender	Male	142	47.3
	Female	158	52.7
Age	18-25	76	25.3
	26-35	150	50.0
	36-45	56	18.7
	>46	18	6.0
Occupation	Government servant	46	15.3
	Private	100	33.3
	Self-employed	72	24.0
	Student	28	9.3
	Retired	10	3.3
	Unemployed	44	14.7
Nationality	Malaysian	189	63.0
	China	17	5.7
	United Kingdom	19	6.3
	Sweden	2	0.7
	Thailand	19	6.3
	Australia	18	6.0
	India	2	0.7
	Saudi Arabia	12	4.0
	Germany	14	4.7
	Bangladesh	2	0.7
	Singapore	6	2.0
Marital Status	Single	168	56.0
	Married	124	41.3
	Divorced/Widowed	8	2.7
Education Level	Primary School	3	1.0
	Secondary School	6	2.0
	Diploma	109	36.3
	Bachelor Degree	168	56.0
	Post-Graduate	14	4.7
Income	<RM3000	97	32.3
	RM3000 – RM6,999	113	37.7
	RM7000 – RM 9,999	62	20.7
	>RM10,000	28	9.3

Based on the findings in Table 1, majority of respondents were females with a percentage of 52.7%. Even so, the difference between male (47.3%) and female is not significant with only a difference of 16 in frequency.

In terms of age, most of the respondents were in the 26-35 category with a percentage of 50%. This shows that majority of respondents were young adults. The second most age category was 18-25. The least age group was less than 46 years old group with a percentage of only 6%. It can be interpreted that Langkawi being a more popular destination for young adults rather than the senior age groups. There might be less activities or attractions that could satisfy the senior age groups. In reality, most of the activities offered in Langkawi were mostly rigorous activities such as parasailing, jet-skiing, snorkelling and so on.

In terms of occupation, majority of the respondents were working in the private sector (33.3%). The second most respondents were self-employed (24%) followed by government servants (15.3%) and unemployed (14.7%) respectively. Students from universities and colleges were the second least with a percentage of 9.3% followed by retirees with a percentage of 3.3% at last. Considering that the survey was done in a non-peak season which was in the month of April, the number of those who were from the private sectors were higher than the other sectors of the market because of their possible erratic working hours. Self-employers such as entrepreneurs were second among the groups possibly because they could arrange their own working time rather than government servants and students who are bound to a certain type of working schedule.

Based on Table 1, the results indicated that most respondents were Malaysians with a percentage of 63%. The rest of the respondents were non-Malaysians. This is expected as Langkawi is a popular destination for Malaysian tourists as there were many attractions that appeal to them such as shopping, adventure and historical and cultural attraction. The non-Malaysian tourists were mainly from the United Kingdom and Thailand, both with a percentage of 6.3%. Respondents from Australia come next with a percentage of 6%. There were also respondents from China which make up to 5.7% of the total respondents. German respondents total up to 4.7% in percentage followed by Saudi Arabian respondents with a percentage of 4%. Singaporeans make up to 2% of the total number of respondents followed by Sweden, Bangladesh and India, all of them with 0.7%. From these results, there were no clear trends in which continent has the majority number of tourists that arrived in Langkawi.

Based on the results shown in Table 1, most of the tourists were single (56%). This was probably because majority of the age groups were from the young adult groups. The island is probably famous for beach parties, adventure and other rigorous activities that attract the young adult age group. Tourists who are married make up to 41.3% of the total respondents. They would usually come in couples or in large families bringing their children with them. Divorced or widowed respondents are the least with only 2.7% of the total respondent. It can be said that Langkawi is a more popular destination among young adults; however, there are some activities and locations that may attract older age groups, especially at the more secluded areas of Langkawi such as Tanjung Rhu. This is because that the older age group prefer some form of solitude and they prefer avoiding crowded places such as Pantai Chenang and Pekan Kuah.

The results also showed that most of the respondents were degree holders (56%). The second highest education level among the respondents was diploma which is at 36.3%. Post-graduate level comes in third rank with a percentage of 4.7% followed by secondary school (2%) and primary school (1%). This shows that the respondents had a high education level distribution.

Table 1 shows the respondents income in four different range categories. The highest category as can be seen from the table is the RM3000-RM6999 range with a percentage of 37.7%. The less than RM3000 category comes second followed by the RM7000-RM9999 category at 3rd rank. The more than RM10000 category shows the least number of respondents with a percentage of 9.3%.

5.2. Evaluation of the Satisfaction Level of Tourists Based on Accommodation, Transport, Safety, Activity and Motivation Factors

In this study the satisfaction level of tourist is measured by the differences between the mean score of expectation and the mean score of realization. The gap value indicates the level of satisfaction. The negative score shows dissatisfaction whereas the positive score shows satisfaction among tourists. With that, the overall mean score for expectation and realization is calculated by using all the dimensions and the overall gap is calculated to determine the satisfaction level of tourists in Langkawi.

Based on the findings in Table 2, the largest gap was item number 18 with a score of -0.82. The item was related to reasonable price range for activities offered in Langkawi. Most tourists were dissatisfied with the priced offered to them by service providers. This was probably due to the erratic pattern of price ranges for example; a parasailing activity in Pantai Cenang costs RM120 whereas the same activity in Pantai Tengah costs RM50. This shows that the activity providers were not handling their price ranges fairly. Another finding show that the experience gained from the activities was not up to par with the expectations of tourists. The value for this dimension is at -0.29. This suggests that tourists were not satisfied with the experience gained from the activities they participated in. This is possibly because the activities lack interpretive values or less interpretation is done by the operators.

On the other hand, tourists show satisfaction towards item 3 which was the reasonable price for accommodation. This item shows the highest positive value which was +0.24. Most tourists were satisfied with the price of their place of stay probably because they did not expect the accommodation prices to be low. Langkawi is usually considered as a top tourist destination therefore; tourists might expect the range of prices for accommodation here to be on the high side.

Item 1 shows another positive value of +0.14. This item relates to the accommodation's comfort. Most tourists show satisfaction towards the level of comfort of their place of stay. The accommodations available here were equipped with facilities that could satisfy most tourists such as water heaters, parking spaces, adequate bed sizes, wireless internet connections, television and so on. The healthy competition between accommodation providers proves to be beneficial in aiding the level of tourist satisfaction towards their stay in Langkawi.

Based on Table 2, two out of five domains show positive gap value. This shows that the tourists were satisfied with only accommodation and transport domains. The other three domains (motivation, activities, and safety) show negative gap values indicating a form of dissatisfaction. Tourists were most satisfied with their accommodation as the mean score calculated for accommodation statements shows the highest positive value. On the other hand, tourists were most dissatisfied with the activities domain as it shows the lowest overall mean value.

The results show that the overall mean is negative (-0.10). The score is calculated by having the overall mean score of realization (4.13) minus the overall mean score of expectation (4.23). This indicates that the tourists aren't satisfied with their visit to Langkawi. Even so, the gap value is not that significant. This is because there are still other dimensions that tourists are satisfied with.

In theory, each negative valued item needs to be improved. However, according to Sapari et al. (2013) states that, "it may not be necessary to improve all attributes that show negative gaps because that could lead to waste of resources (effort, money and time) if the improvement works do not take into account the importance of the attributes from the visitors' perspective." Therefore, to achieve a more systematic approach towards improving the domains is by constructing the Expectation-Performance Analysis grid.

Table 2 Mean for Expectation and Realization of Tourists

Dimension	Mean Expectation	Mean Realization	Gap
Accommodation			
1. Comfortable accommodation	4.2	4.34	+0.14
2. Variety of places to stay	4.2	4.21	+0.01
3. Reasonable price for accommodations	3.77	4.01	**+0.24**
4. Friendly staff handling the accommodation	4.23	4.24	+0.01
5. Easy accommodation booking	4.15	4.25	+0.10
Total	4.11	4.21	+0.10
Safety			
6. Helpful authorities	4.11	4.1	-0.01
7. Trustworthy people in general	4.05	3.92	-0.13
8. Safety at place of stay	4.27	3.98	-0.29
9. Travelling safely around the island	4.32	4.17	-0.15
10. Safety when participating in activities	4.36	3.93	-0.43
Total	4.22	4.02	-0.20
Transport			
11. Easy to find transports	4.11	4.15	+0.04
12. Various form of access towards points of interests	4.17	4.28	+0.11
13. Price range of transports	4.03	4.09	+0.06
14. Driver's knowledge of the island	4.29	4.38	+0.09
15. Ease of transport booking	4.19	4.27	+0.08
Total	4.16	4.23	+0.07

Activities			
16. Interesting activities provided around the island	4.33	4.1	-0.23
17. Knowledge gain when participating in activities	4.24	4.04	-0.2
18. Reasonable price range for activities	4.3	3.48	**-0.82**
19. Experience gained from activities	4.28	3.99	-0.29
20. Uniqueness of activities provided	4.12	4.05	-0.07
Total	4.25	3.93	-0.32
Motivation			
21. Able to relax physically and mentally	4.4	4.16	-0.24
22. Discovering new places/things around the island	4.39	4.17	-0.22
23. Calm atmosphere of the island	4.21	4.13	-0.08
24. Able to have a good time with family and/or friends	4.3	4.35	+0.05
25. Able to escape busy lifestyle	4.32	4.08	-0.24
Total	4.32	4.18	-0.14
26. Overall mean	**4.23**	**4.13**	**-0.10**

5. Conclusion

It can be said that Langkawi Island is a premier destination for tourists whether domestic or international to enjoy their holidays and trips. This is because Langkawi has high potential, in terms of tourism, as it could cater different types of tourists as it has many natural resources and man-made resources to offer. The island is a haven for shoppers as it is duty-free, excites eco-tourists with its natural-based destinations and inspires tourists with its rich cultural heritage sites. Even so, with negligence from the responsible bodies, Langkawi could fail to satisfy tourists that arrive to the island. With increasing tourist population, annually, it is hard to monitor the level of satisfaction of tourists. Therefore, Langkawi's authorities could consider using the outcomes of this study to further improve which attributes that are slowly degrading and unsatisfying the hearts of tourists.

In terms of demographics, most of the tourists were young adults age between 26 to 35 years. The majority of the tourists were working in private sectors. The reason is probably due to the flexibility of their working schedule. Also, most of the tourists are degree holders and many of them are Malaysians. For non-Malaysians however, we could see the majority of tourists are from the UK and Thailand. This is probably because the promotion of Langkawi as a tourist destination is quite extensive. The Malaysian government has done many incentives to promote the tourism sector. For instance, last year (2015) is the declared as the "Year of Festivities" by the Ministry of Tourism.

It was also found out that the tourists were satisfied with their accommodations and the transport available there. This suggests that the accommodations in Langkawi are diverse in terms of price range and type. There were hotels, homestays, apartments, motels, and even rooms for rent available in Langkawi providing tourists with more options. This also applies to transport. There are many forms of access in Langkawi. This includes cars, scooters, and boats. However, most tourists are dissatisfied with the other domains which are safety, activity and motivation. There is a lack of safety procedures in recreational activities offered in Langkawi. The activities here were too pricey and many tourists were unable to enjoy Langkawi as a calm destination.

6. Implications of the study

The study has shown that most respondents were dissatisfied with their stay in Langkawi Island however, the level of dissatisfaction is low. One of the implications that could be taken from this study is for the authorities to consider on recreational activity providers in terms of their management and practices. Pricing is a major contributor of dissatisfaction among respondents as the prices are unreasonable and biased depending on tourists' demographic profile. In addition, safety concerns on recreational activities such as parasailing are obvious and affects the satisfaction level of tourists on the island. This study points out that better management and governance is needed among service providers on the island.

In terms of theoretical implications, this study uses the expectancy disconfirmation theory which proves that satisfaction of tourists can be measured by their expectations and realizations gap values.

7. Limitations and recommendations for future research

One of the limitations of this study is that the time frame is short as some financial constraints were present. In order to conduct a more thorough research about satisfaction of tourists on their stay a longer time span is needed when conducting the survey. The study also used general domains as the basis to evaluate satisfaction levels. Future studies on tourist satisfaction should include more domains and detailed attributes that cover a broader spectrum regarding holiday satisfaction.

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EMOTIONAL ATTACHMENT AND PRO-ENVIRONMENTAL BEHAVIOR OF DOMESTIC TOURIST IN NATIONAL ELEPHANT CONSERVATION CENTRE

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ABSTRACT

Emotional attachment refers to a special connection between a person towards another person, object and a place. The concept which started with the relationship between a mother and son has evolved into many disciplines and attachment studies. It has also broadened to include brands, objects and places. This study focuses on how emotional attachment could influence environmental behaviour among tourists. With regard to environment issues, this study tends to search for an alternative method to engage tourists to act environmentally, besides the normal awareness campaigns. Through this study, emotional attachment is tested as a factor that could influence people's awareness and concern which later influence them to act environmentally. The National Elephant Conservation Centre (NECC) needs support from domestic tourists as it is through them that conservation messages could be delivered and helps in the conservation efforts. A model which includes emotional attachment, awareness, environmental concern and environmental behaviour will be tested on domestic tourists that visit the NECC to determine whether tourists with emotional attachment possess environmental behaviour and whether with more awareness, tourist will become more concern towards the issue. This model will be analysed using the Structural Equation Modelling (SEM) and AMOS Graphic software. The output from this study will be an alternative method to encourage people to conserve the environment by developing activities that will possibly make tourists more emotionally attached to the National Elephant Conservation Centre (NECC).

Keywords: Emotional attachment, awareness, environmental concern and pro-environmental behaviour.

1. Introduction

Environment issues have been widely debated particularly on human and wildlife conflict which have been reported all around the world (Distefano, 2005). Asian wildlife are now facing many threats ranging from hunting to loss of critical habitats (de Silva, 2016). Human and wildlife conflict was a behaviour or acts of wildlife species that may cause death, injury, property destruction, damage of crops, depredation of livestock or could cause fear on public safety (Department of Wildlife and National Park, 2013) and human and wildlife conflict are predicted to increase globally (Kansky & Knight, 2014). Therefore, it is essential to study how to instil pro-environmental behaviour to tourists as this will be the alternative to make people appreciate and care for the environment. Nowadays, many campaigns to increase public awareness on the consequences of people activities toward natural environment have been carried out such as the non-government and government cooperation to plant more trees in the campaign to plant 26 million trees; one citizen one tree by the Perak State Forestry Department in April 2010. However, Malaysia's wildlife is faces extinction when their habitat is being destroyed. According to Dr Benoit Goossens, the director of Kinabatangan Wildlife Sanctuary have stated that wildlife in that sanctuary have been threatened by forest conversion into agriculture and poaching activities even though that area have been gazette as a sanctuary (Bernama, 2015). The Department of Wildlife and National Park (DWNP) have also recorded a total of 37,822 cases of Long-tailed Macaque disturbances, a total of 4,864 cases or an average of 973 cases a year of human-elephant conflict, a total of 2,872 complaints of wild boar disturbances, 2,943 cases on human-civet conflict and a total of 1,460 complaints on human-Pig-tailed Macaque disturbances for the period of 2006 to 2010 (DWNP, 2013). These numbers have shown that Malaysia's wildlife habitat is increasingly threatened.

Today, many awareness campaigns have been carried out due to the increase in environmental problems especially with the massive floods that hit the country every year. It is no doubt that awareness is important to protect nature. This study explores whether it is enough for a tourist to have only awareness to make them to act environmentally or do they need to be concerned too. Previous study have revealed that emotional attachment has a stronger impact on residents' pro-environmental behaviour (Zhang, Zhang, Zhang, & Cheng, 2014). Therefore, in this study, the domestic tourist pro-environmental behaviour will be predicted by emotional attachment with awareness and environmental concern tested as the mediator. To ensure the success of the conservation efforts, domestic tourist is seen as the best supporter compared to international tourist, as it is much easier for domestic tourists to engage with conservation efforts in protecting the wildlife and natural environment regarding time, money and distance factors.

2. Emotional attachment, awareness of consequences, environmental concern and its relationship with pro-environmental behaviour.

Emotional attachment was basically a concept of human place bonding which originally developed from the attachment theory by John Bowlby (1979). The concept which started with a relationship between a mother and son evolved into many disciplines and attachment studies have broaden to brand, objects and place. In this study, emotional attachment is referred as a unique connection between human with specific spatial setting like the National Elephant Conservation Centre (NECC). Emotional attachment has been tested as multi-dimensional constructs where it consists of place dependence, place identity and social bonding (Kyle, Graefe & Manning, 2005).

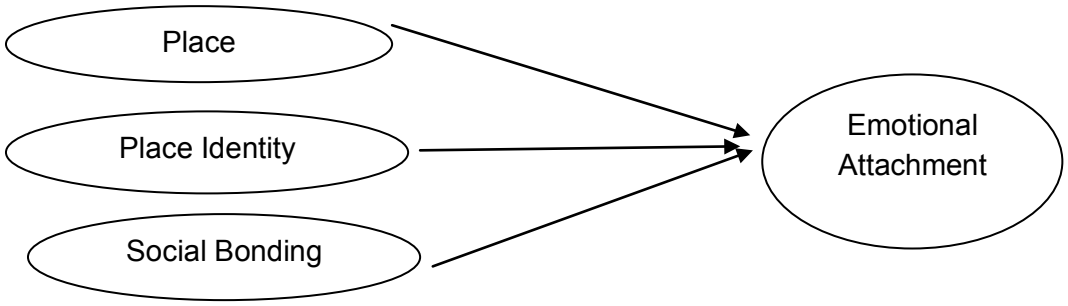

Figure1 Emotional Attachment as multidimensional construct

Awareness can be defined as being aware of something or to have a full and clear knowledge of what to do or experience, existence or reality of that thing while from the psychological aspect it is an ability to perceive, identify, think and behave in an appropriate manner (Rafika, et al., 2016). In this study, awareness is referred as the state where a person has knowledge on certain things and in the case of the present study, awareness refers to the importance of conserving the elephant. In many conservation efforts, awareness is the key element for people to conserve wildlife as with higher public awareness on the impact of human activity on the environment, there is stronger tendency that they protect the environment (Buta, et. al., 2014). The focus on raising awareness may not be enough to make people act environmentally as human and wildlife conflict is increasing. For example, human and Borneo's elephant conflict is increasing due to deforestation which results in loss of habitats (Borneo Post online, 2015). It also cannot be assumed that people who do not act environmentally is not aware and concerned about environment problems. Same goes if they do have concern on the environment, this is not always reflected in their behaviour.

Meanwhile care is defined as an act of commitment and caring itself is a process of commitment and constancy. In the cycle of caring process, it starts with emotional attachment (Kroth & Keeler, 2009). In environmental education, caring is considered as core of all successful education (Mihalas, et al., 2008). As in the field of recreation, care is defined as environmental concern. People who have attached emotionally to a place will most likely act to protect that place (Stedman, 2002). Therefore, in this study, awareness and environmental concern will be tested in a model of place attachment to determine its relationship with pro-environmental behaviour.

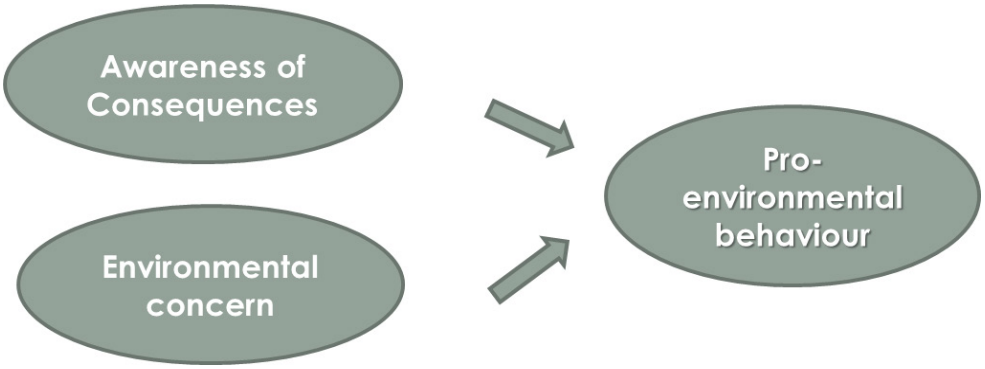

Figure 2 The relationship between Awareness of Consequences, Environmental Concern and Pro-environmental behaviour.

Previous study had proved that awareness of consequences and environmental concern has major effects on pro-environmental behaviour (Fujii, 2006). A person cannot be concern of certain thing if he or she did not have awareness on that particular thing. For example, we cannot simply concern on natural environment if we did not know the importance role of natural environment in our life. As concern is an act of commitment, it will influence a person to act environmentally. Whereas for place attachment, it become the strong factor to predict the pro-environmental behaviour and have a positive effect on awareness of consequences (Zhang et al., 2014). This also support by Stedman (2002) where a person who had emotionally attached to a specific place would be expected to protect that particular place. Awareness is generating through the knowledge they gained from the activities they had participated at the place and this had been showed from the study on level of tourist awareness before and after participate in activities at NECC where the result show an increase of tourist awareness after participated in activities (Sharifah Nur Hidayah, 2005). However, protecting a place is a part of pro-environmental behaviour and for this study, it will be focusing on conserving the elephants and its' habitat.

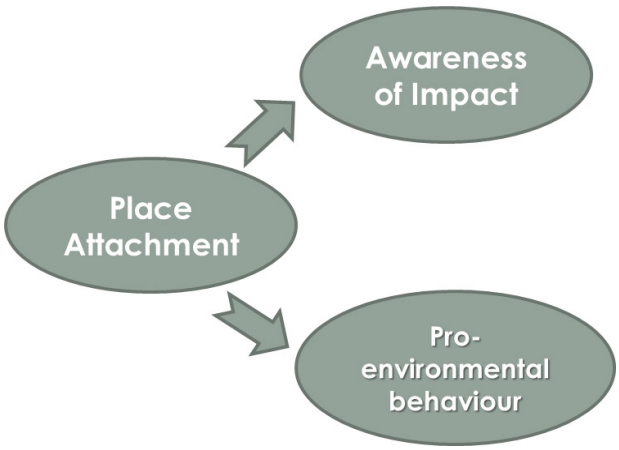

Figure 3 The relationship between Place Attachment and Awareness of Impact and Pro-environmental behaviour.

Former studies did not study the mediating role of awareness and concern between emotional attachment and pro-environment behaviour. Therefore, this study will test a model that combines emotional attachment, awareness, concern and pro-environmental behaviour. Through this approach (Hypothesis model), it will help the National Elephant Conservation Centre to educate tourists on the elephant conservation effectively. The hypothesis model was adapted from Ramkissoon, et al. (2013) that originally tested the dimensionality of place attachment and its relationship with place satisfaction and pro-environmental behaviour.

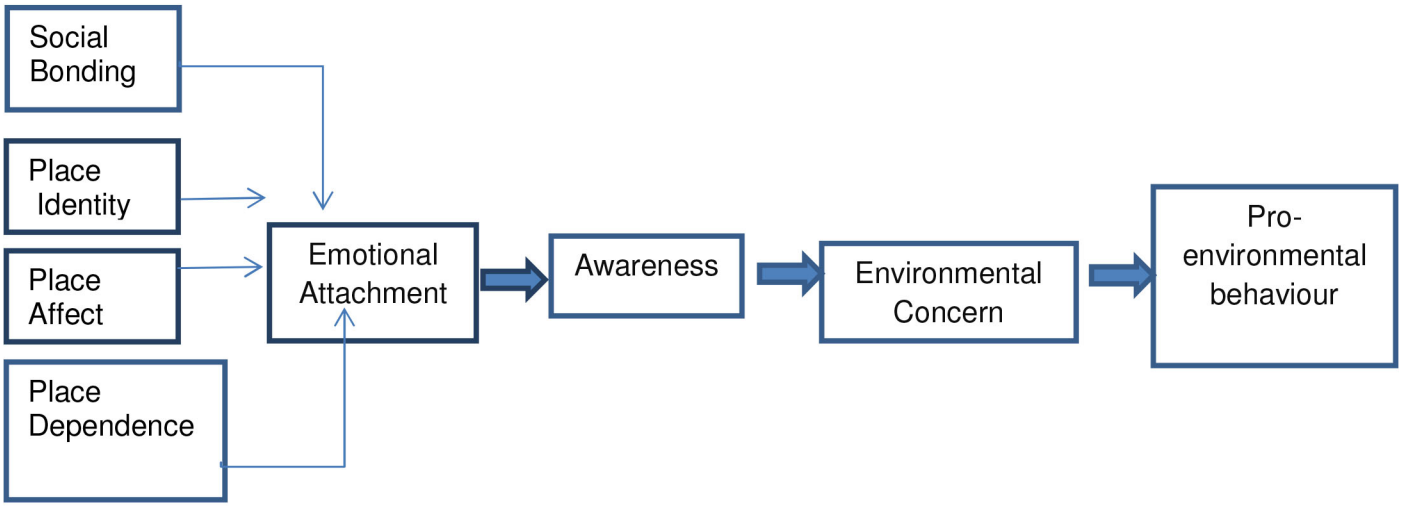

Figure 4 Hypothesis Model of the study

2.1 Emotional Attachment as a conservation effort at National Elephant Conservation Centre

Emotional attachment can be a tool for conservation effort at National Elephant Conservation Centre (NECC) as it is a good approach to make people aware and concern which later would influence them to act environmentally (Stedman, 2002). As a conservation Centre, NECC also acts as an education center to educate people on the importance of conservation. When people develop emotional attachment to nature or a setting they have the tendency to protect the setting by involving in resource protection (Buta et al., 2014). Therefore, understanding tourists' emotional attachment to NECC will facilitate NECC's management in improving their efforts to promote the conservation of elephants and its habitat. To make a person concerned about nature, they first need to have knowledge about the impact of human activities on the environment. This is why it is important to firstly create awareness to them. Tourists will become emotionally attached through the hands on activities provided by NECC as recreational activities have been found to increase park visitors' attachment towards the recreation resource visited (Buta et al., 2014). Through the activities, they will also be educated on the importance of protecting the elephants and their habitat.

In the hypothesis model (Figure 4), concern was put after awareness because to be concerned a person must have knowledge (awareness) on what they will be concerned on. Furthermore, in the value-basis theory which is an extension of Schwartz's (1977) norm activation model of altruism, it suggested that concerns about specific environmental issues are due to awareness of harmful consequences of environmental problems to a value or valued object (Schultz, 2001). Knowledge about the importance of protecting the elephant and its habitat will generate tourists' awareness towards the impact of human activities on the environment and this will also influence them to be concerned on environment.

Environmental concern is said to have a major effect on pro-environmental behaviour (Fujii, 2006). Therefore, tourists who are concerned on the environment tend to act pro-environmentally. In this study, tourists' emotional attachment at NECC will be assessed to find out whether they have an awareness and concern or just being aware but not concerned after participating in activities at NECC. To ensure the success of conservation efforts, the support of domestic tourists is important. Domestic tourists also can act as a medium to spread elephant conservation message after they visited NECC. Furthermore, emotional attachment have been proven to have a positive relationship with satisfaction (Prayag & Ryan, 2012) and as an antecedent to destination loyalty (Yuksel, et al., 2010). Tourists who are emotionally attached to NECC are most likely to visit again and this will increase the number of visitation that will benefit the local community in terms of generating more income. Realizing the importance of NECC to their livelihood, local residents also help NECC management in protecting the elephants and its habitat. In this study, tourists' awareness and environment concern will be tested as the mediating effect between emotional attachment and the pro-environmental behaviour.

Through this study, the NECC management can use it as a reference and an alternative to inculcate pro-environmental behaviour to tourists.

3. Methodology

3.1 Study context

This study will be conducted at the National Elephant Conservation Center (NECC) which is located at Kuala Gandah, Lanchang Pahang in Krau Reserve Forest. The center is home to elephants that have been saved from their disturbed habitat before relocating them to other suitable forest. Besides saving and relocating the elephants, NECC also acts as a platform to educate people about elephants and its conservation. This place provides activities that give visitors knowledge about the elephant, its life circle and its role to the environment in maintaining the diversity and ecological integrity over extensive areas. Located in the Krau Reserved Forest makes this centre surrounded by natural environment which becomes an attraction to many tourists. It differs from other wildlife conservation centre as the NECC offers interaction with the elephants through activities like feeding, cleaning and bathing the elephants. These activities can potentially make tourists become emotionally attached to NECC.

This centre is known as one of the popular ecotourism destination in Malaysia and among the many wildlife conservation centres that receives many tourists. For the year 2015, NECC received the highest number of tourists, a total of 190,645 as compared to the previous years (NECC, 2016). This becomes the main reason for the study to be conducted at NECC. Furthermore, the number of domestic tourists (166,058) was 50 percent higher than the number of international tourists (24,587) for the year 2015. Local community support towards the protected area is a must but the support of domestic tourists is essential to ecotourism destination especially in helping to increase local community economic (Chaminuka, et al., 2012). High number of tourists will also encourage politicians and authorities to protect the centre and keep the existence of the protected area (Weaver, 2001). As a destination which receives significant number of domestic tourists, it becomes a perfect place to study the effect of domestic tourists' emotional attachment on their pro-environmental behaviour (Ramkissoon, et al., 2013).

3.2 Instrument and analysis

Participants of this study will be asked to complete an anonymous self-reporting questionnaire to gauge their responses. The measurement used the five point Likert scale ranging from 1= strongly disagree, to 5= strongly agree. The questionnaire in this study is designed to determine respondents' demographic features; their emotional attachment, awareness of consequences, environmental concern and pro-environment behaviours. The emotional attachment question were adapted from Vaske and Kobrin (2001) and Halpenny (2010). The awareness and environment concern were measured by adapting the Value Based Norm (VBN) theory and questions were categorized into egoistic, altruistic and biospheric. Pro-environmental behaviour were measured by their low to high efforts pro-environmental behaviour adapted from Ramkissoon, et al. (2013). A pilot study will be carried out to verify the questionnaire before the actual data collection is conducted. This study will use the Structural Equation Modelling (SEM) and AMOS software (V.22) to measure the hypothesis model.

4. Conclusion

Basically, people will not protect something that does not benefit them. With the environment education activities carried out at NECC, it is hoped that tourists will gain awareness through the information they received during the activities and instil concern on environment. Emotional attachment is recognised by some researcher as a potential concept that may be used to influence behaviour by benefiting from individual's willingness to protect important and meaningful places (Ramkissoon et al., 2013). Therefore, if tourist is emotionally attached to a place like NECC they will possibly protect the natural environment. Through this study, people's emotional attachment can be measured to determine either it affects awareness and concern to influence pro-environmental behaviour. The output from this study would be an alternative to encourage people to act environmentally besides contributing to the body of knowledge. Besides the local community, domestic tourists' support is also important as they can help to increase local community's economic level. This relationship will also ensure the sustainability of NECC specifically and natural environment generally. Therefore, studying domestic tourists' emotional attachment and pro-environment behaviour is crucial.

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INFORMATION ACCURACY (IA) FRAMEWORK FOR TOURISM BUSINESS (TB) INFORMATION DISSEMINATION

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ABSTRACT

This paper provides an overall review of the information dissemination practices in Tourism Business (TB). The contexts of TB information dissemination are analysed in line with Information Accuracy (IA) requirements. TB information originated from the common pool of information channels and is disseminated to travellers for travel planning. The TB information is disseminated to travellers by government bodies, tourism organizations and TB industry players. The TB information is disseminated to travellers in the forms of conventional methods such as flyers, brochures, pamphlets, booklets and guides; and through digital methods such as internet, social network, trip advisor portals and tourism web sites. The common pool of TB information resources comes from various information channels that is collectively responsible to disseminate accurate information to travellers. TB Information is largely perceived as a key resource that gives organizations such as the tourism industry an insistent edge. Many studies have indicated travellers used inaccurate TB information to make travelling decisions. The inaccurate dissemination of information to travellers will have an impact on travellers' planning and decision making capabilities. Studies have shown that information is importantly significant in light of the fact that it helps many organizations advance in best practices, encourages learning and improves adequacy to ensure the quality of information. There is a developing acknowledgment that basic to TB information creation and authoritative execution, there is still a developing zone of request whose key variables, connections and suggestions of quality TB dissemination is yet to have clear accurate information dissemination route. This paper consists of three major parts: firstly, to review and discusses the issues of existing TB information dissemination practices; secondly, to propose the IA Framework for TB Information Dissemination practices and thirdly how the proposed IA Framework for TB Information Dissemination practices can contribute and enhance the current tourism information dissemination activity to ensure accurate dissemination of TB information to travellers.

Keywords: Tourism business, Tourism Business information dissemination, Information Accuracy, Information Dissemination Practice and Tourism development

1. Introduction to Tourism Business (TB) Information

The Tourism Business (TB) is a rapidly growing industry and has always been the most important financial intermediaries in Malaysia. The Economic Transformation Programme (ETP) is expecting the Malaysia Tourism industry to achieve the target of 36 million tourist arrivals by 2020 which will contribute RM168 billion (US$48 billion) to the country (Rajaratnam et al., 2014). With regards to the ETP expectations, the tourism industry in Malaysia needs to be more efficient and systematic in disseminating quality TB information to travellers. The tourism industry information must be more efficient and systematic to ensure travellers are able to receive complete information about their traveling plans and to ease travellers' decision making capabilities.

TB information is a broad research area with many different aspects to be explored such as information identification, creation, organization, storage, dissemination, use and management (Xiang & Law, 2012). With regards to TB information, the quality of information is an important element to ensure the credibility of the disseminated information to travellers. In many organizations, information and compilation processes are monitored to ensure that the information received is accurate and provides positive impact to the decision making exercise (Anany et al., 2009). From the TB perspective, Information Accuracy (IA) could be characterized as the capability of the information framework to reduce disparity between the planned travel and the actual travel encountered (Ahmed et al., 2009; Munar & Jacobsen, 2013). Travellers can evaluate and determine whether the received information is accurate by performing a simple comparison with their travel life cycle.

As changes in the global TB continues to evolve and accelerate in the new millennium, the tourism system will face monetary pressure to become more efficient, competitive, technology driven and strategically focused. In the current tourism environment, there is always room to question the IA of disseminated information (Munar & Jacobsen, 2013). There is grave possibility that the disseminated TB information could be misleading or is inaccurate. Considering the available TB information through the traditional and online mediums, the accuracy of information that is being disseminated in TB can be openly questioned (Aaberge et al., 2004; Munar & Jacobsen, 2013).

Taking into consideration of the grey area in IA and the gaps of IA in TB, this paper will be able to provide the overview of IA issues in TB and suggest a framework to ensure IA practices in disseminating accurate TB information. In line with the findings of the review, we propose IA Framework for the TB Information Dissemination practices and how the propose IA Framework for TB Information Dissemination practices can contribute and enhance the TB information dissemination accuracy level.

2. Investigate and discuss the existing TB Information Dissemination Practices

TB information dissemination is the process that allows TB related information reaching travellers on a timely basis. The information dissemination practices should take into consideration of information credibility and quality, before being made available to travellers. As in Figure 1, we have identified the existing tourism information dissemination practices into few areas. Figure 1 illustrates the existing tourism information dissemination aspects into three areas:

Figure 1 The existing tourism information dissemination areas

Generally, the overviews of information disseminations process are as per Figure 1. The TB information dissemination starts with tourism related meta or raw data that has been developed and produced by the industry players or government bodies. These meta or raw data is made available in TB through conventional ways or digital methods. The respective TB information centres or agencies will disseminate the TB information in their preferred ways. The information acquisition process begins when travellers search for interested TB information through conventional or digital TB information sources.

- In Area 1, the review focuses on the disseminated tourism related information that has been classified as meta or raw data. The TB meta or raw data is the source of information before TB related information is being generated and disseminated. In this area, we will focus on meta or raw data that leads to information dissemination with poor information credibility and assurance.
- In Area 2, we will review the disseminated information in terms of how travellers search for tourism related information and make use of the searched information to make a decision. We will also be able to provide a review on whether the searched information is reliable for decision making.
- In Area 3, we will look into the disseminated information credibility and quality and the challenges faced by TB in disseminating quality information. We will review further the existing practices that contribute and affect the credibility of TB information.

2.1. Disseminated Tourism Meta or Raw Data

TB information dissemination is the practice in which TB enable travellers gather TB related information for their traveling plans. The information dissemination practice determination begins with the meta or raw data of TB, which contributes to the origination of TB information. Meta or raw data has attributes of high level of TB information for dissemination purpose. By analysing the set of raw data in the absence of information quality attributes, many organization tend to improve the information dissemination practice, so that the disseminated information can be more accurate and reliable (Chakraborty et al., 2012).

The lack of quality information in TB causes deficiency of disseminated TB information to travellers. Mass and complex TB information contribute to deficiency of information. Travelers encounter difficulty in making decision and planning their travel with poor quality of TB mass information. TB information deficiency caused by TB information inadequacy includes human errors in organizing TB information, unfiltered TB information source, poor TB information quality, TB credibility and TB information overload (Roeder & Simard, 2013).

Human error is predominantly identified as one of the main factors for poorly disseminated information (Lucassen & Schraagen, 2011). Too many errors are made at the beginning of TB information creation stage which contributes to the defects of disseminated IA in TB. The error in the raw data caused by poor process flow or mechanism is what makes it unable to assure IA. Contribution of Information Communication Technologies (ICT) is not good enough to maximize the disseminated IA and quality. Although there are available ICT approaches to ensure TB IA, the existing ICT faces challenges in fulfilling this basic need of TB. These challenges include poor TB process specification on the outcome expected from the existing TB information, and the human disposition that oversees the needs of ICT system to meet the organization's needs to fulfil TB IA Assurance (Ahmed et al., 2012).

Information credibility and quality is one of the decisive factors in information dissemination and decision making. Nowadays, the task of distinguishing credible information from less credible information often lies on the end user. By analysing the current scenario, online information is not easy to trust per se, and travellers should be aware of the possibility of encountering poor-quality information (Munar & Jacobsen, 2013). Poor information quality contributes and impacts on travellers' capability to make decision on their travel plan. Information quality should be considered as an important characteristic of tourism information dissemination.

There is a need for a detailed consideration on how information dissemination practices are being adopted in TB. In TB, information dissemination through social networks, blogs, web repositories, tourism agencies, word of mouth and commercial media are trending in the present era as an important way of conveying information to travellers (Kim & Tussyadiah, 2013). Consequently, travellers often refer to the available tourism information for travelling purposes. The transformation of tourism information via the internet and electronic social media is also increasing proportionally. The "digital native" and "net-generation" have created phenomena where the speed of dissemination of tourism-related information has increased (Kang & Schuett, 2013).

In the social network sphere, particularly in the tourism sector, travellers commonly become content creators, co-marketers, co-designers, co-producers and co-consumers in developing and sharing of travel and tourism experiences (Kim & Tussyadiah, 2013). This is also known as the User-Generated-Content (UGC) where many travellers communicate with each other more directly (Chalkiti & Sigala, 2008b). Thus, with the general practice and open flow of TB information dissemination in the digital edge, the sharing of TB information without proper authentication is crucial and shared IA becomes questionable.

By analysing the social media in terms of its types and content or function, we can confidently conclude that the information being disseminated is failing in terms of its level of accuracy. The free flow of information dissemination via social networks need to go through a proper mechanism to ensure good IA Assurance. In line with the need for IA Assurance in the dissemination of tourism information, further analysis of social media platform shows that any digital interaction via social networks are lacking on accountability of shared information (Harding et al., 2013). This shows that the disseminated information in social mediums need IA Assurance.

The existing TB raw information needs to be verified in terms of IA. The verification of the existing TB raw information is to ensure that accurate information is disseminated to travellers. The lack of IA in TB meta data analysis confirms the findings of the available studies that the TB data has been manipulated (Kim & Schwartz, 2012). In TB raw data analysis, the TB raw data contains TB mass information which will be leading to deficient of information, inadequacy of information, data inconsistency and poor IA assurance. Due to the listed information issues, TB information credibility is identified as the main factor that defeats the travellers' decision making capability. The identified poor practices in meta data analysis findings contribute towards poor information quality and practices in TB, thus affecting poor decision making capability.

2.2. Tourism Information Acquisition

In TB, information acquisition is an intensive process for tourists seeking for tourism related information. Information acquisition can be defined as a process of seeking or searching for disseminated information through reliable sources for decision making purposes (Chorus et al., 2010). In the current digital era, information acquisition for vacation planning through websites, social media and tourism agencies are largely popular. Finding shows that more than 70% of the search traffic through web sites and social media are utilized on travel-related activities (Leung et al., 2013). A traveller's information search is influenced by their information search behaviour. The analysis on tourist traveling behaviour and the impact of proper traveling data is important. Traveling decision usually involves information that should be reliable, consistent and accurate. The studies also indicated that the accuracy of the searched information empower travellers to consistently use the referred source to further search for TB information (Arif et al., 2012; Ramos & Rodrigues, 2013; Wu et al., 2013).

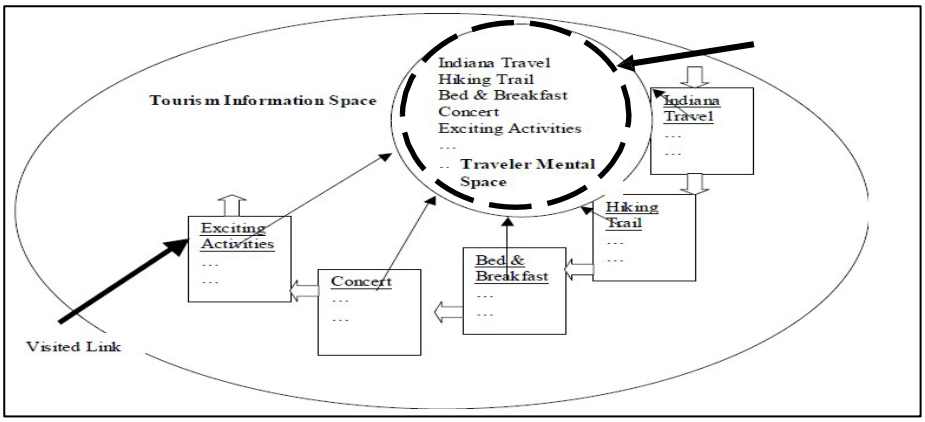

Figure 2 Travel information search in Internet (Jacobsen & Munar, 2012)

Figure 2 provides an illustrated view on the current information search in Internet and the types of information disseminated to travellers. According to Jacobsen and Munar (2012), the traveller's information search processes is as shown in Figure 2. It shows the interaction between three parts: the traveller, the tourism information space (contains disseminated information) and the interface (Jacobsen & Munar, 2012). Research indicates that travellers have very limited knowledge about the tourism products and hence the available information in Internet needs to be accurate for traveller to make decision. During the information searching stage, travellers will put in key words through the search engine, clicking through the results on the web sites, evaluating results and refining their query. The findings show that travellers are keen with the quality information to enable them to make decision. The available information should not be overwhelming rather it should be providing sufficient information for travellers to refer (Fesenmaier et al., 2011).

Information seeking processes in TB is the backbone of the digital age growth. Travelers obtain information through web sites, blogs, social media and many other digital methods. The social media in particular is the most important information sharing and acquisition medium that travellers refer for TB information (Xiang, 2011). Information in the social media utilizes the central domain concepts where the dissemination of the information is real time information (Jaewon & Leskovec, 2010; Qu & Lee, 2011). The information growth with global TB, particularly in China, is that the travellers' websites have been the most prominent information facility to share and disseminate information. Information retrievals via web repositories have grown (Batouche et al., 2012). The TB online information centralization with tourism information center is the core value served by the internet and online reviewers to provide wide use of online user evaluation for their decision making process information search (Tan & Tang, 2013). According to Tan et al. (2013) and Smirnov (2013), there are three stages of information dissemination, which are the pre-visit, after a trip and post-trip. They had identified the information flow and had indicated a gap of information flow between the pre-trip and after the trip. Figure 3 gives a brief understanding of these three stages of information flow and the missing gaps. The omitted or missing gap between stage 1 (Pre-visit) and 2 (After Trip) may contribute to the lack of information assurance when the shared information is disseminated to travellers (Smirnov et al., 2013). The requirement for information between stage 1 and 2 is crucial to the decision making process.

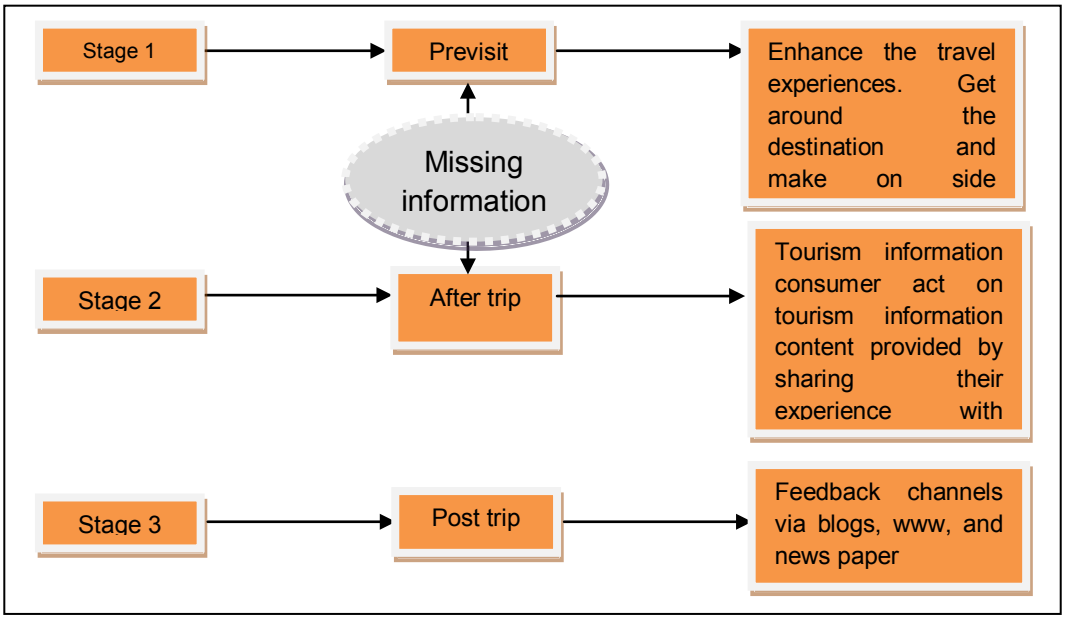

Figure 3 Information Acquisition (Tan & Tang, 2013)

Information search is the consistent message about the qualities of a place or environment. Basically, there are two methods of obtaining the disseminated information which are through the internal and external information source. The internal information search is based on the retrieval of knowledge from memory or experience while the external search consist of categories like family and friends, destination specific literature, media and travel consultant (Angskun & Angskun, 2009). Cox et al. (2009) had investigated the mode and practices of travelling planning processes during pre-trip, during-trip and post-trip as the micro level of information search. Based on the model in Figure 5, travel planning model presented that information search actively happens between pre-trip and during-trip period. The type of information searched during pre-trip and during the trip were information about the destination, expenditure required, activities, travel dates, places of attraction, transportation, length of trip, rest stops and food stops (Cox et al., 2009).

Vacation planning via the Internet focuses on the macro-level analysis and contributes to the various determinations of information search. The different models of macro-level stages are proposed, as in Figure 4. It is known as the five-stage process that involves the general decision, information acquisition, decision-making, activities, and evaluation processes. The five-stage process also involves other three steps processes of decision making.

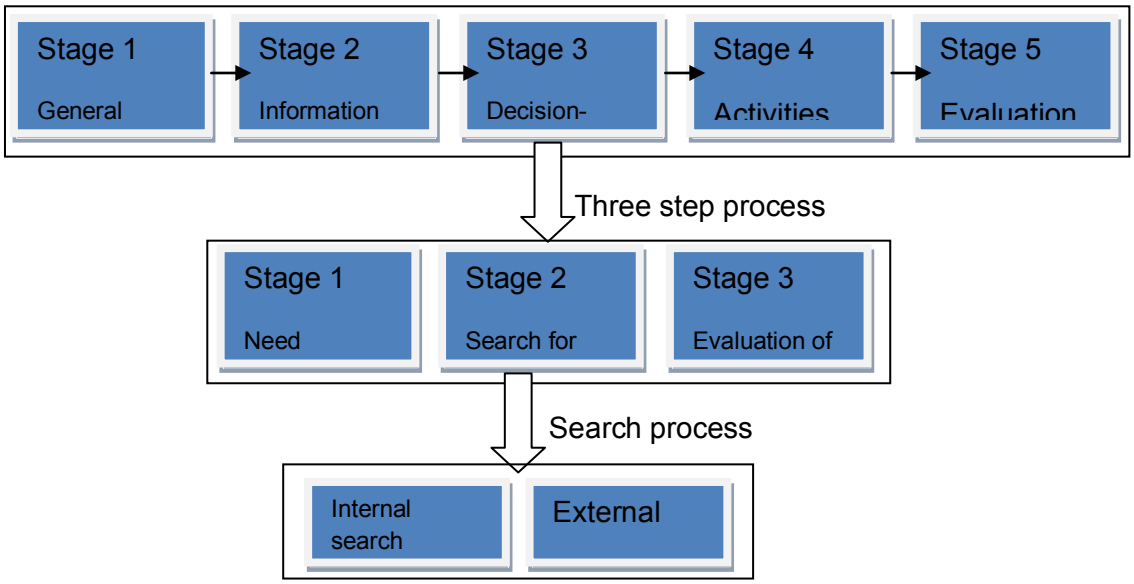

Figure 4 Information Search Flow (Cox et al., 2009)

According to Cox et al. (2009) the micro level search of disseminated information in Figure 4 needs to be supported by information that is classified as reliable and current. The available information is overwhelming and travellers need time to analyse the information before using the information as reference point for decision making.

The model in Figure 5 describes further the relationship of the macro level in information search. Referring to the macro-level analysis to obtain information, travellers rely on dominating information to plan their trips.

The dominated information included marketing and non-marketing sources such as advertisements, commercial publications, travel brochures, guidebooks and many more. On the flip side, the reasonable model of get-away arrangement through the web might be seen as the human interaction collaboration on online space. The online space content providers different types of information, technology and communication models to travellers (Daniel & Adrian, 2008).

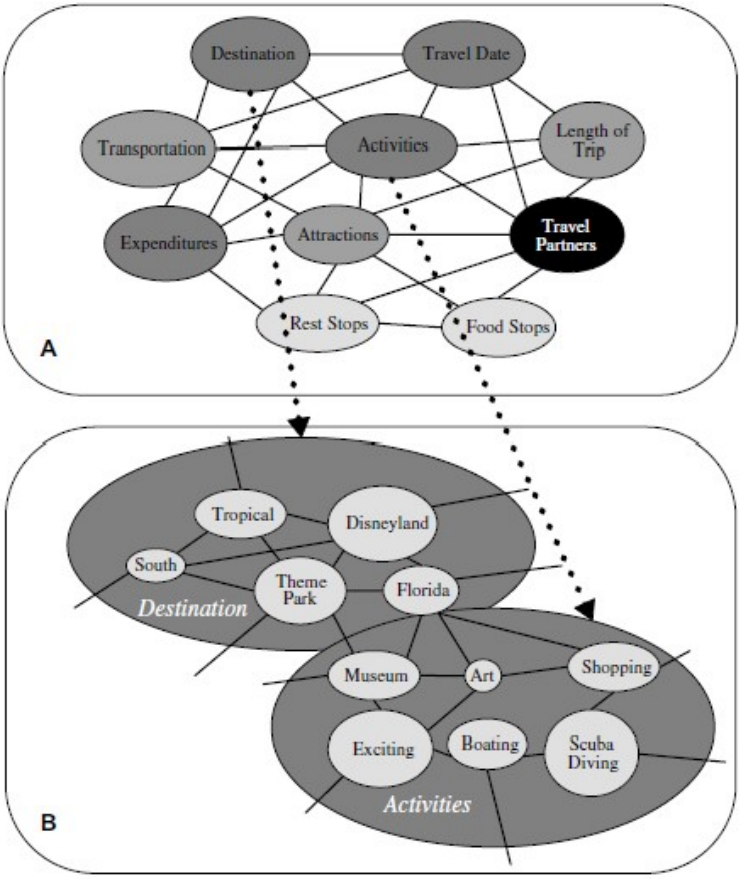

Figure 5 An Illustrative Semantic Mental Model of a Vacation Planner (Fesenmaier et al., 2011).

According to Fesenmaier et al. (2011), Network A as shown in Figure 5 is the diverse hubs communicating to distinctive sub-objectives in which the contrasting haziness of the hubs communicates to the changing unbending nature and centrality levels, whereas the darker hubs stand for additional focal and inflexible sub-choices. Case in point, travel accomplices is a focal aspect of the relax plan and is therefore troublesome to change. Interestingly, one's decision for rest stops generally change as stated by another excursion sub-choice. The features of the excursion arrangements are interrelated and are dependent on one another. This choice system depicts the get-away arrangement procedure for a large amount of generalizations. Assuming that one zooms in on every hub, every feature is embodied in a group of related ideas, which characterizes the traveller's semantic mental model.

Fesenmaier et al. (2011), also stated that Network B in Figure 5 is a delineation of two summed up bunches of the end of the line and exercises in Network A that have been amplified to uncover the underlying structure. The Network A and B provides the relation of information available from the initial stage, i.e. from the raw information until the information is being referred by travellers for travelling planning. The finding shows that travellers need to analyse the mass information to make decision on their vacation planning (Fesenmaier et al., 2011).

Disseminated information search in TB is a complicated process. Tan and Chen (2011) had reviewed factors travellers search for information and evaluated the online travellers' information source credentials. Categories of information sources through internal and external search were used to obtain information. In particular, Tan and Chen (2011) had discovered the contribution of websites and blogs that were used to share travel experiences. Information credibility is conceptually classified as a source for trustworthiness and attractiveness. Hence, in this regard the trustworthiness of the information is questionable for the content of the information can be created anonymously (Kang & Schuett, 2013).

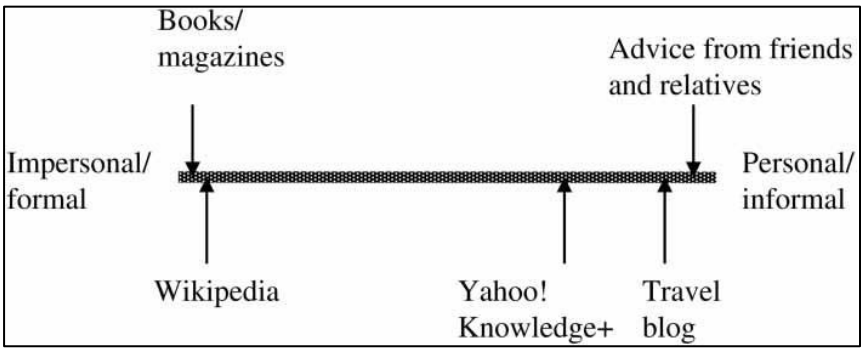

Figure 6 Classification of traveler's information sources (Tan & Chen, 2011)

Despite this, Ho et al. (2012) has indicated the role of social media as a source for information searching activities. Information search is a part of the process for travellers to make decision. Virtual travel communities are one of the ways to obtain information. The information search process consists of cognitive and knowledge structure information retrieval mechanism. The information search uses information hubs containing many links for information acquisition. The growth of social media contributes greatly as a source for distribution and accessibility of tourism information. Ho et al. (2012) analysed the six-stage model of the information search process which are, task initiation, topic selection, pre-focus exploration, focus formulation, information collection and search closure. Use of search engines were recognized as a major search strategy in seeking information (Ho et al., 2012).

The social media has been a significant impact as a source of information and dissemination in the TB industry. The social media websites in the form of Consumer-Generated Content (CGC) generally consists of blogs, virtual communities, wikis, social networks and collaborative tagging. The information is normally shared through YouTube and Flickr which have gained popularity over the years. Overwhelming information through social media is another issue that travellers need to deal with as well (Batouche et al., 2012; Ho et al., 2012).

The contribution of web application for information exchange is substantial. In today's world, the Web 2.0 also referred to as Travel 2.0 in tourism, has a wide spread of new applications in the social media. Despite that, the multimedia sharing concept like the sharing of video, photo and podcasting also have an impact on travel decision making (Cao et al., 2013).

The contribution of electronic social media like Facebook can be referred to as the electronic word of mouth to disseminate information. In this digital age, social networks are playing an important role in disseminating accurate information to the end users (Xiang, 2011). However, the lack of accurate information via social networks will affect travellers' confidence, trust and decision making capabilities. IA Assurance is a definite requirement that all social medias and organizations must consider (Liang et al., 2013).

The growth of web 2.0 applications in knowledge sharing has always been the building block for information search and dissemination. The increase of internet forums, discussion boards and virtual discussion environment reflects the importance of information intensiveness and knowledge management (Chalkiti & Sigala, 2008a). For example, analysis by Chalkiti and Sigala (2008) mainly focused on the development of virtual communities on the creation of network and information exchange. Godara et al. (2009) had explained the evolution and growth of collaborative software including of web portal, discussion forums, weblogs and wikis to share and disseminate information. There are also studies on the "micro" and macro" of online communities and their favouritism in relation to information dissemination (Godara et al., 2009).

Despite the traditional methods of information sharing in the tourism industry, the contribution of social network sites for the same purpose has emerged as an important medium. Travelers very often select the existing social network sites as their tool for communication (Xiang & Gretzel, 2010) . The common use of social network sites are for travel knowledge sharing like destination selection, trip-planning and other related activities (Nan & Guanling, 2010). The sharing of information on visited places via social networks, blogs and wikis are more prominent and shared information needs to be more accurate to enable travellers use and refer this information for decision making (Nan & Guanling, 2010; Sigala, 2011; Tang et al., 2013; Zarmpou et al., 2013).

In TB, the information acquisition process is known as a complex process with mass TB information. The information acquisition through websites, social media and tourism agencies are the known methods for the travellers to gather information on their travelling plans. The available information through these sources is the reference point for travellers to gather information and make decision. As highlighted in various studies, the information gaps between pre-visit and after trip will contribute towards poor information accuracy assurance and affects travellers' ability to make decision (Munar & Jacobsen, 2013).

2.3. Disseminated TB information Credibility and Quality

The current practice in disseminating TB related information is through conventional and modern methods. The conventional dissemination ways are, such as flyers, brochures, pamphlets, booklets, guides and many more. The digital methods are the so called modern methods which are through internet, social network and web sites. Regardless of which ways the TB related information is transmitted, information credibility is important to manage and maintain the originality of the information. Generally, to improve information dissemination practices, introduction of new ICT or information strategies are specifically developed. These strategies includes the Visitor Information Center (VIC) exchange model that is developed to assist VICs in disseminating information effectively, to capture the information exchange updates and to move information dissemination from traditional methods to ICT compliance methods (Shipley & Bowker, 2014). According to Sheldon (1997), which identified the organizations involvement in dissemination of TB information, the conceptual practice of Information Dissemination in TB is as illustrated in Figure 7.

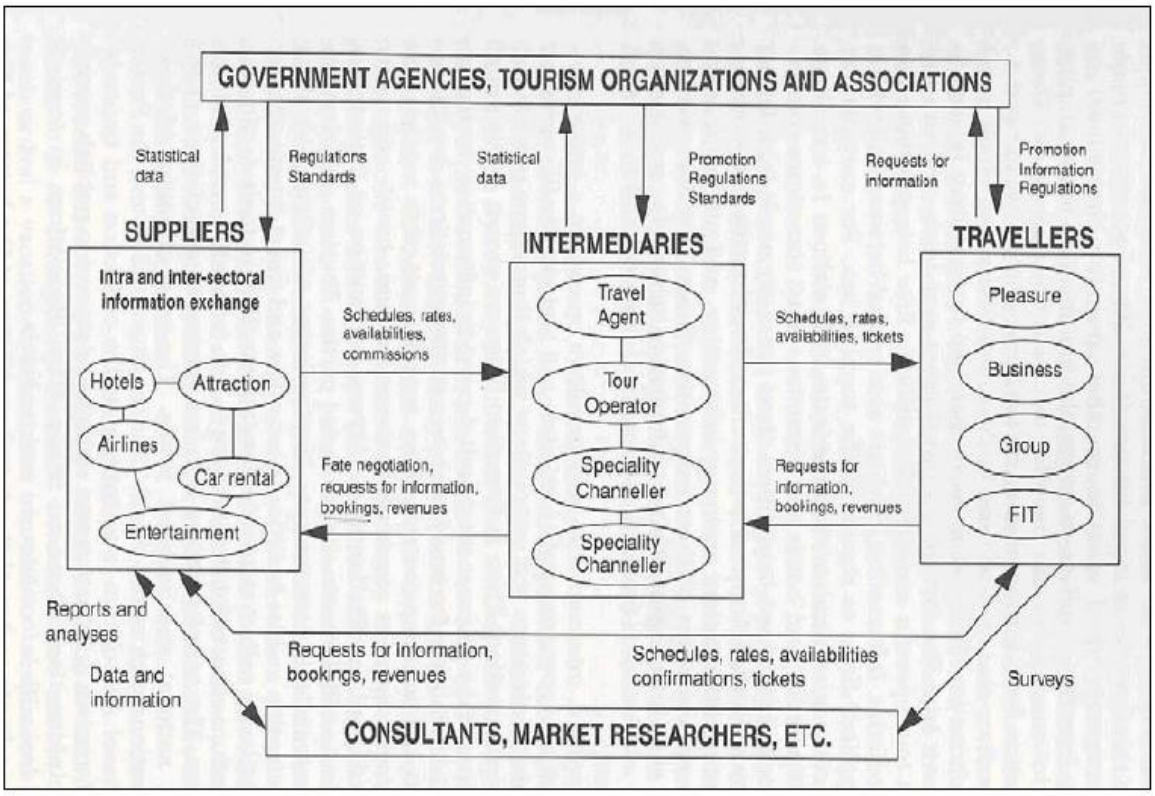

Figure 7 Tourism Information Exchange Model (Karim et al., 2009)

The Figure 7 provides the details of organizational involvement in dissemination of TB related information. The model in Figure 7 provides the communication path of information exchange between the suppliers, intermediaries and travellers (Karim et al., 2009). However, the information validation and verification from one level to the next level were not detailed. This can lead to invalid information being disseminated to travellers.

Information management is largely perceived as an important resource that provides organizations with an insistent edge. Previous studies have proven that knowledge sharing is significant as it helps organizations advance in best practices, encourages learning and improving adequacy of information use. Albeit, there is a developing acknowledgment that knowledge sharing is basic to information creation and authoritative execution. However, there is still a developing zone of request whose key variables, connections and suggestions for tourism associations are not yet clear (Wang et al., 2012; Yiu & Law, 2013).

The existing practice of TB information dissemination in the social network is rapidly growing. The classification of social network sites in terms of information dissemination can be divided into 4 levels, which are, the first level: Yahoo travel, second level: Wikipedia and Trip Advisor; third level: Myspace, Facebook and Travel buddy; and the fourth level: Second life (Aaberge et al., 2004; Akehurst, 2009; Yinghua et al., 2010; Al-Sharawneh et al., 2013).

Table 1 provided more details of identified practices in social networks in terms of information dissemination.

Table 1 Existing practices in Social Networks

Types of Social Networks involving TB	Practices of information dissemination
Weblog	Share experience
Online community	Disseminate information, passing time
Travel community	Sharing information

Some of the poor practices in information dissemination via social networks are,

- Information Source: large information is not validated and widely spread without quality credibility check.
- Information sharing and dissemination with their peers: there is no assurance on the accuracy of the shared information
- Information dissemination authorization: anyone can disseminate information online and there is no proper mechanism to assure the credibility of the information shared.

Information dissemination has been identified as one the main methods to broadcast TB related information to travellers. TB information can be disseminated in conventional methods that include flyers, brochures, pamphlets, booklets, and guides; or using digital methods such as websites, social networks and internet. Whichever methods used to disseminate TB related information, information credibility is important to ensure the originality of the information.

The biggest challenge in TB practices is the existing TB related information credibility and quality. Information quality can be defined as raw data that fulfill the information credibility characteristics such as information completeness, relevancy and accuracy (Ahmed et al., 2009; Kresse et al., 2012; Liang et al., 2013). The existing TB information dissemination, facing setback in introducing the notation of information quality. TB information from various sources produces low quality of information due to inaccuracy, inconsistency and incompleteness of what TB information and these effect on travellers' decision making considering that TB information content credibility is essential for accurate decision making (Kim & Lee, 2004).

Modern TB information is the tourism information chain, where the ICT is the most basic component that accelerates the TB information dissemination. ICT will be the platform for the current modern frameworks impacting the way in which tourism data is made, traded, assessed and how connections are shaped and kept updated. The ICT allows travellers to retrieve mass of information for decision making (Lucassen & Schraagen, 2011).

The challenge encountered by today's tourism industry is the credibility or quality of the existing TB related information. Thus, information credibility such as information completeness, relevancy and accuracy is the core element to ensure travellers' decision making is accurate.

Some of the major concerns of IA in TB are the inaccuracies of available information, overwhelming information, lack of a structured process or flow of available information in a digital age and unfiltered information on social networks (Jacobsen & Munar, 2012).

The TB information gaps highlighted by the National Tourism Organization indicated that TB is hungry and overwhelmed by the existing information. Nevertheless, the source of information is worrying to the world. The information gaps in TB are of doubtful quality and correct information source is needed. The accessibility and source of information in TB provided by government agencies, tourism commissions, agencies, regulatory bodies and other sources can further improve the quality and accuracy of the available information (Redel-Macías et al., 2013).

Travelers are now demanding for higher level of information by examining the existing resources that provide forecast information for travelling purposes. Today, in the digital age, regional and global tourism has grown so fast that the dissemination of information related to tourism is shared via social media, web repositories, travel agencies and international/local authorities and tourism centers alike (Adam & Urquhart, 2007; Sotiriadis & Zyl, 2013). The needs for higher level information are necessary to ensure IA level in TB.

Majority of the studies sought to identify the models that most accurately predict future tourism demands and the ways in which accuracy can be improved. It was proposed that inconsistency in the results of accuracy tests could be attributed to variation conditions and data type and therefore there might be a set of models that perform better than others in certain identifiable conditions (Kim & Schwartz, 2012). Hence, travellers need better mechanisms and assurance to plan their trip end-route to making their travel decisions. Travelers are sensitive to accuracy of the accessible information as this may clear their hesitation on their travel activities. Travelers are often specific about risk, ineffectual and reliable information when planning their travel (Ahmed et al., 2009; Ben-Elia et al., 2013).

The information spread through social networks enable people to learn new information without recognizing the source of the information. There is also an indication that people normally prefer the latest information in helping them make their decision (Jaewon & Leskovec, 2010). Frequently, social network information is inferred from witness reports; past exploration, in any case, has demonstrated that such reports are profoundly wrong representations of social association (Husain et al., 2012).

Web information is developing so quickly, hence, enhancing the productivity and correctness of Web information recovery is a daunting struggle. There are two principal issues with respect to the adequacy of Web information gathering, namely mismatch and over-helm of information (Xujuan et al., 2007).

In this digital age, information inflow over the network is uncontrollable. The wide spread of information flow policy allows the flow of information to be disseminated to all parties. However, it is unable to ensure that the disseminated information delivers the accurate information (Yi & Panda, 2007). Lack of Standard Operating Procedures (SOP) for information formation and dissemination via existing platforms is very critical. Today, the possibility of sharing information with the latest technology is without any barriers. This in-turn beckons an issue in the tourism business context i.e. the existing information which contributes to decision making lacks accuracy characteristics (Jovicic, 2013; Yen et al., 2011).

Another concern that needs to be analysed is the trustworthiness of the available information in TB. Information credibility and completeness are the other concerns that affect IA in disseminating Tourism Business information. Generally, the IA in TB lacks in trust due to inaccurate information and widely available information from various technological sources that had contributed to poor decision making amongst travellers (Chiappa, 2011; Dickinger, 2011; Munar & Jacobsen, 2013).

Generally, the IA assurance in TB should contain high interoperability of trusted information. As define in ISO 9000, the quality of information increases the IA Assurance level regardless of the business nature (Emhmed & Chellapan, 2010). One of the key issues in implementing sustainable tourism is the quality of the available information. The World Tourism Organization indicated the need for evaluating specific information in TB to eliminate poor decisions automatically (Jovicic, 2013).

By analysing the TB related information in line with the fast growing social networks, there were significant disadvantages noted. Some of the major concerns on the available TB information is the lack of trustworthiness, not in a timely manner and lacked descriptiveness (Harding et al., 2013). The need for TB to ensure good IA Assurance is extremely important and it is a requirement that only quality and accurate information is being disseminated publicly for decision making. Thus, the IA Assurance is necessary to ensure that the information provided can be trusted, is accurate and can be referred to as the main source in decision making.

As per studies and references, the need for IA Assurance is vital in TB. IA standards are able to limit the information deficiencies and increase the trust level of the available information (Emhmed & Chellapan, 2010). We have learned that the existing IA practices in TB needs further improvements and we have listed in Table 2 the identified practices for further evaluation of their feasibility in TB. The identified practices have been considered from the tourism stakeholders' point of view.

Generally, the existing poor information dissemination practices affect the TB information dissemination processes. The impacts of the poor practices such as information overloads, in-accuracy, credibility of information source, lack of ICT contribution in ensuring TB information accuracy affects the TB stakeholders, particularly the travellers in their decision making. Travelers often will be furnished with lease TB quality information that surely affects their decision on travelling (Palakvangsa-Na-Ayudhya et al., 2011; Tan & Chen, 2011).

The source of quality information in TB has always needed a detailed study. TB is one of the industries that are thirsty and hungry for quality information. High quality of information can only be achieved if it involves elements of accuracy as its main concern. The organization or any other types of respectful repositories are responsible to provide quality information (Lam & McKercher, 2013). By analysing the existing TB Information and its poor practices, it reveals the potential of improving TB information to gain good IA Assurance.

Mass information that are available in TB leads to practices like information overwhelming, lack of trust in the information provided, inaccurate information and information mismatch with the information main source. TB information gaps, credibility of information source and unfiltered information through digital media contributes to the poor practices of TB related information.

2.4. Findings of Poor TB Information Dissemination Practices

Based on the review conducted in the current TB information dissemination, it seems like the disseminated information is questionable from the aspects of information credibility and accuracy. Table 2 provides the list of practices and impacts caused by these poor practices in conventional and digital environments.

Table 2 List of practices in conventional methods of disseminating TB information

Existing Practices	Impact
Overloads / overwhelmed by Information's in Tourism Business.	This will cause overwhelming of information and effect on the decision making process.
Inaccurate information reference, misleading information's and Information dissemination.	Poor information dissemination and decision making capacity for travellers.
Information source and unfiltered information's via social networks.	Reliability of existing information source.
Implication of Information and Communication Technology (ICT)	Poor ICT contribution in Tourism Business leads to poor decision support.
A lack of structured process or flows of available information's in the digital age	Confusing information flows and lack of quality information in digital media.
Information Source	large information was not validated and just widely being spread without credibility.
Information sharing and dissemination with their peers	No assurance on the accuracy of the shared information.
Information dissemination authorization	Anyone can disseminate information online and there is no influencer or proper authorization mechanism to assure the credibility of the shared information.

2.5. Proposed IA Framework for TB Information Dissemination

In proposing the IA Framework for TB Information Dissemination, we consider the existing poor practices in TB during meta or raw data dissemination, information acquisitions and evaluation of disseminated information. The details of these poor practices are listed in Figure 8. The proposed IA Framework for TB information dissemination practices consists of three components IA practices, IA Quality Measures and Accurate information dissemination.

The propose IA Framework for TB Information Dissemination practices desire to focus more on business and to adopt continuous improvement. At this stage, traveller's use of TP information at the present times focus on conventional and digital methods for information gathering and decision making. As such, we have considered all these aspects of information gathering and dissemination during the formulation of the proposed IA Framework for TB Information Dissemination.

Traditional and digital mediums are the main resources for travellers. They are the major providers of information for travellers for pre-during-post visits arrivals. The context level of the Proposed IA Framework for accurate information dissemination best practices can contribute and enhance the current tourism information dissemination

Figure 8 illustrates the origination of best practices to ensure accurate information dissemination in TB. The need for IA Framework for TB Information Dissemination is to develop the practices of accurate information dissemination in TB.

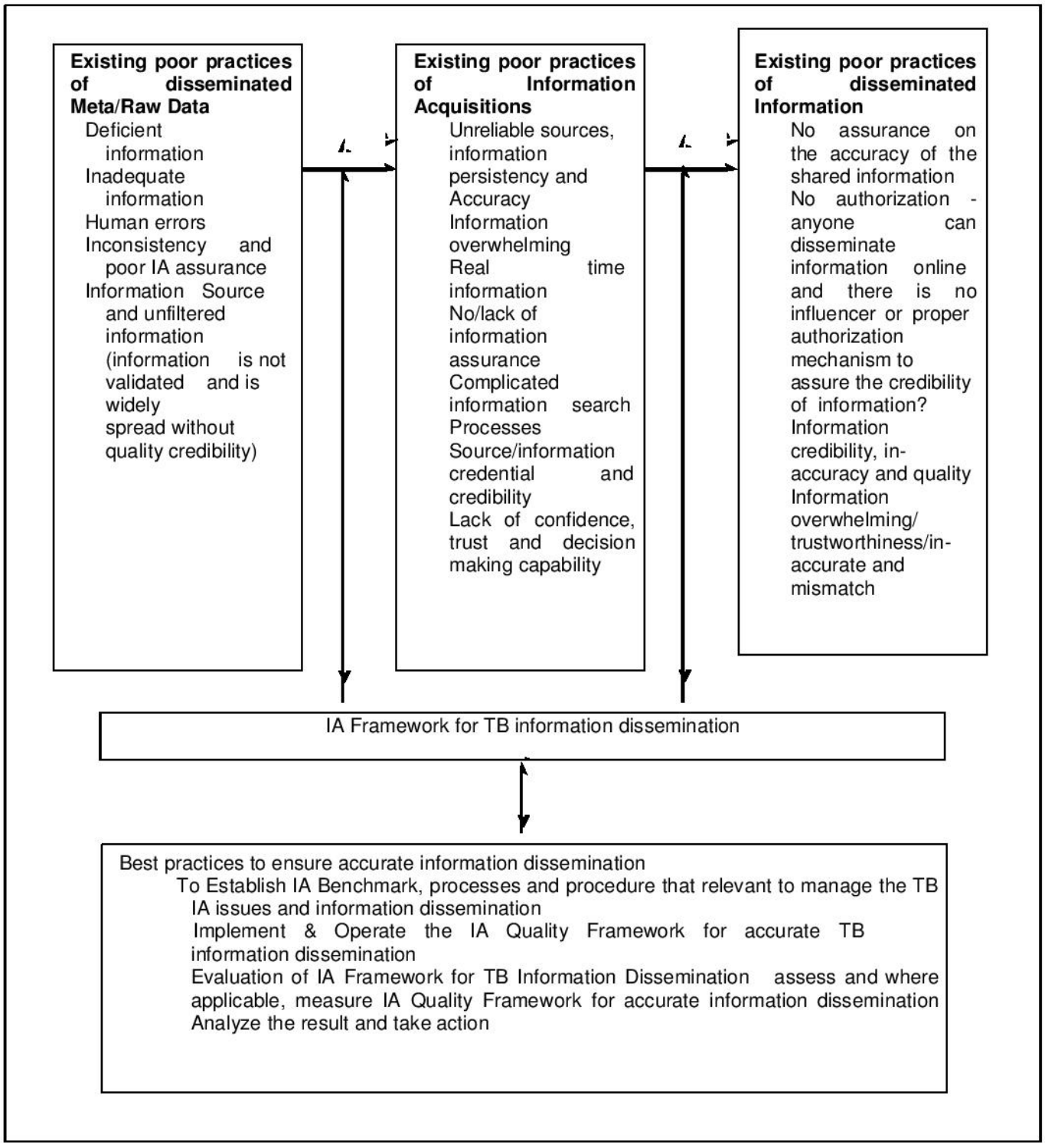

Figure 8 List of TB poor practices in information dissemination.

2.5.1. IA Framework for TB Information Dissemination

Figure 9 illustrates the overview of IA Framework for TB Information Dissemination. The establishment IA benchmark, processes and procedures is relevant to manage the IA issues and information dissemination. As for the IA benchmark, Figure 9 shows the IA Quality Measures and explains the attributes of these quality measures.

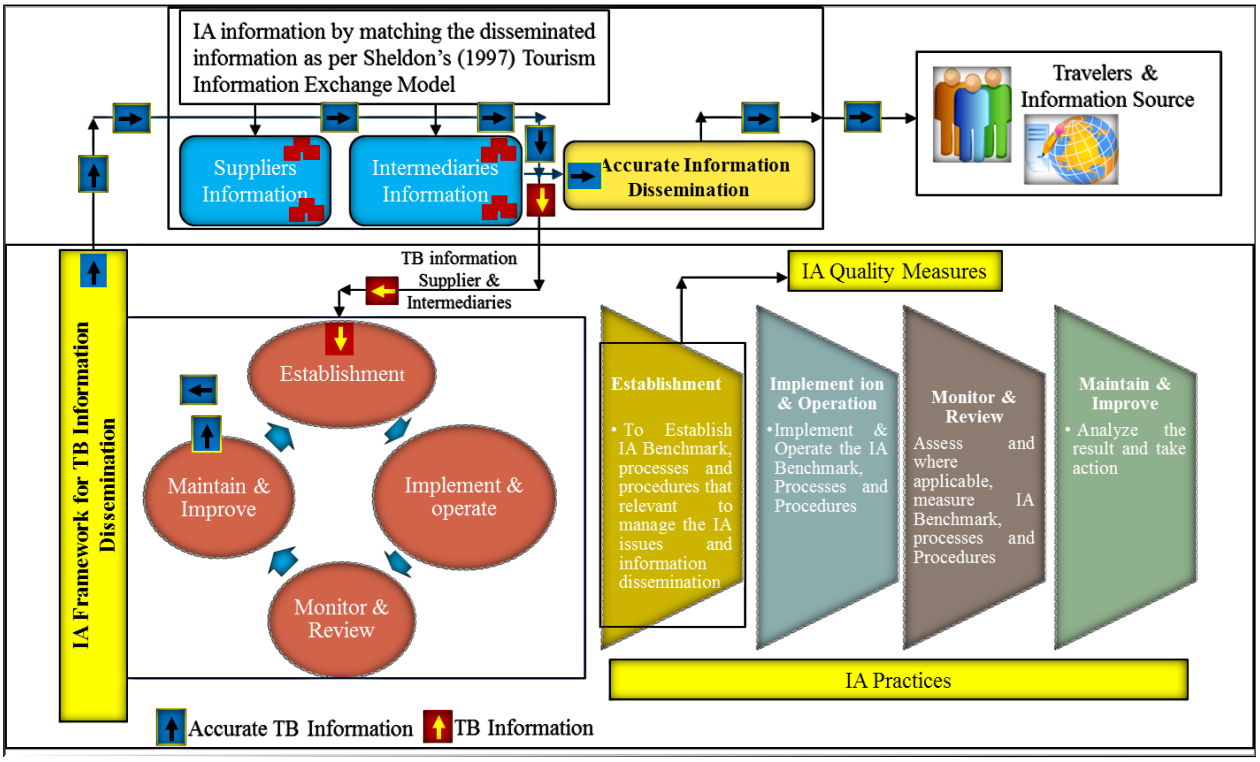

Figure 9 IA Frameworks for TB Information Dissemination

The IA Framework for TB Information Dissemination consists of four practices to ensure accurate information dissemination. The detailed explanations of each practice are:

Practice 1: Establishment – It is to establish the IA Benchmark, processes and procedures that is relevant to manage the IA issues and information dissemination. Before the tourism information is disseminated to travellers, there is a need to practice to ensure the potential information from conventional and digital medium is evaluated as per IA Quality Measures (Şendağ et al., 2012). The IA Quality Measures is to ensure the information disseminated is accurate to travellers. As in Figure 10, the IA Quality Measures (Şendağ et al., 2012) consists of four different aspects of information quality practices, which are :

- IA Quality Dimension – Information Accuracy
  - This is the broad area of the information dissemination practices which is an important aspect to be considered during the next three IA quality framework.
- IA Quality Element– Information Source, Content and Assessment of Source of Information
  - Three important elements to ensure information accuracy are Information Source, Content and Assessment of Source. At this level, the information source and Information content must be from reliable source. The parties responsible for the information source and content are the tourism associations and tourism industry players. The information source and content from these tourism players needs to be assessed to ensure information credibility and accuracy.

- IA Quality Indicator– Information source assessment and result validation
  - o At this level, the information source and content needs to be validated routinely in terms of information credibility and accuracy.
- IA Quality Focal Issues – Accuracy of information and Source, Information Assessment and Validation
  - o At this level, the focal issue after the validation of information source and content in IA indicator is reviewed, any mismatch of information needs to be addressed by lopping back the issue to IA quality Framework indicator. Information that is accurate and credible will be communicated to travellers through conventional or digital methods.

IA Quality Measures			
Dimension	**Element**	**Indicator**	**Focal Issues**
Accuracy	Information Source	Information source and content routinely assessed	Accuracy of information and source
	Information Content		Accuracy information regularly assessed
	Assessment of source of information	Intermediate result is validated against the information source	Information compiled from the main source are validated against other independent source

Figure 10 IA Quality Measures (Şendağ et al., 2012)

Practice 2: Implement & Operate – In this practice, the established IA benchmark that is in line with the IA Quality Measures will be implemented and operated. The processes and procedures of implementing the IA quality measures will be imposed for assurance of accuracy. The implementation and operation of the existing tourism related information will be evaluated with the actual information obtained from the Tourism Information Suppliers and Intermediaries.

Practice 3: Monitor and Review – In this practice, the monitoring and review exercise will be conducted to ensure the accuracy of information. The practices during the implementation and operational stage will be reviewed to address any missing or inaccurate information.

Practice 4: Maintain and Improve – In this practice, the analysis of the result is conducted to ensure accuracy of information and action plan to optimize the relevancy and accuracy of information. Upon completion of all four practices, the information that is agreeable to the set of IA benchmark will be made available to travellers for information gathering and traveling decision making. The inaccurate information will be further evaluated before it is classified as accurate information.

2.5.2. The Implementation of IA Framework for TB Information Dissemination

Figure 11 shows Tourism Information Exchange Model (Karim et al., 2009). This model consists of three levels of actors between the information sources. The three actors are First: Suppliers who are the main source of the travel information providers, Second: The intermediaries consist of agencies; and Third: Travelers that are dependent on the information made available to them by suppliers and intermediaries. An overview of the tourism information exchange model is very linear in term of tourism information dissemination without any measures on IA for disseminated information. The proposed IA Framework for TB information dissemination can be a value-added element in this tourism information exchange model to ensure dissemination of accurate information to travellers. The effectiveness of the IA Framework for information dissemination can be further measured and evaluated during the expert review period.

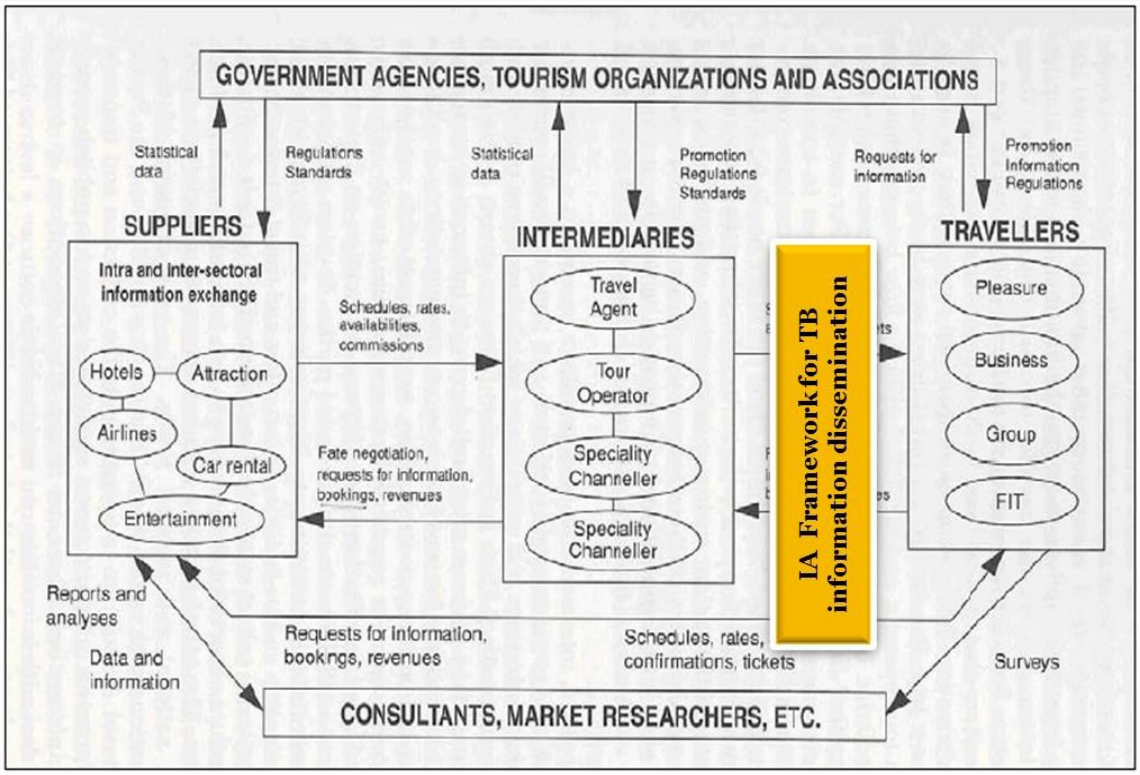

Figure 11 Tourism Information Exchange Model (Karim et al., 2009)

2.5.3. Evaluation of IA Framework for information dissemination

At this level, a post measurement of the effectiveness of the IA Framework for information dissemination is conducted. When we review the IA Framework for information dissemination, the levels in this framework like the dimension, elements, indictor and focal issues are with well-defined criteria's and have their own purposes. Hence, the assessment of the overall IA Framework for information dissemination is important to allow for further revision, update or integration that could optimize the efficiency of this framework. Considering this intention, this framework will assess its effectiveness in line with the disseminated accurate information to travellers.

2.5.3.1. Expert Review of the IA Framework for information dissemination

Tourism is becoming a widespread industry for economic development. The need for forward-looking and sustainable strategies in TB is required. The key element for information quality in TB is important and we need to increasingly pressure this key element to be considered as the basis in TB information dissemination. The proposed IA Framework for information dissemination is capable of providing effective impact to TB information dissemination. Regular review of TB policy plans that involves different stakeholders are important to ensure the proposed framework is current to monitor its effectiveness and can contribute towards sustainable TB information dissemination.

Target Audience/Users' Expert Review of The IA Quality Framework for accurate information dissemination

The target audience of the expert review encompasses different groups of stakeholders who will take part in the review process:

(a) The first group comprise of a team of policy makers in charge of TB information gathering and dissemination. This review process is essential to ensure credibility of information. The TB policy experts will need to work in close cooperation with other TB industry players to ensure the effective of the proposed framework.

(b) In carrying out the review, the TB policy experts will receive support from the remaining TB stakeholders which has requested the review from their end. The additional stakeholders like travellers can contribute towards to the improvement and enhancement of the proposed framework.

3. Conclusion

The concept of IA Framework for TB Information Dissemination is a n e w way of utilizing the existing TB information in an accurate manner. The proposed framework can identify the poor practices in information exchange model. The framework is also able to give positive impact by triggering the correct practices to produce accurate TB information dissemination. In the proposed IA Framework for TB Information Dissemination, the accuracy information dissemination is the main concern. The proposed framework should be able to eliminate the existing poor practices of TB information dissemination and enable travellers gather accurate information for decision making and travel planning. This framework also allows the TB policymakers to achieve the main objective of their information measures such as TB IA, information quality, information credibility and information relevancy towards producing sustainable TB information and development. This publication provides a generic framework based on the current TB poor practices and is able to address and identify the critical factors, best practices as well and reasons for failure of IA dissemination in TB.

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