

MEASURING THE SUSTAINABILITY OF TOURISM DEVELOPMENT: COMPARATIVE ON METHODS AND APPLICATIONS

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Abstract: In general, sustainable development is a concept that promotes the protection of resources in the future. The issues of sustainable development has been discussed and promoted worldwide in various fields including tourism. The elements of sustainable have been enforced to be considered in every development stage. Meanwhile, the World Tourism Organization (WTO) has promoted the application of sustainable indicator since the early 1990s as essential instruments for policy-making, planning and management processes at destinations. Despite growing number of revenue to local community and business operators, tourism brings other challenges towards the environmental protection. Each destination has limited resources that can be consumed by tourism activities. For example, the increased numbers of tourists will have negative consequences in its natural resources in which pressure from tourism activities, would lead to damage on physical and ecological features. As a result, various actions have been taken by the respective authorities to solve the problem by identifying various tools to measure the sustainability such as; Impact Assessment, Environmental Auditing (EA), Carrying Capacity (CC), Sustainable Tourism Benchmarking Tool (STBT), Certification and Eco-Labeling, and others. However, are those methods suitable for every type of tourism development? Recognizing the importance of sustainable elements in tourism development, this paper aims to review on previous studies or practices related with sustainable

tourism. The review would comprise the framework, assessment approaches, criteria, indicator and others. However, there are arguments concerning on the assessment methods, which present more on theoretical rather than practical suitability which will be discussed further. On the other hand, the discussion also will be focused on the approaches that has been developed or practiced by few countries including Malaysia. It is perhaps through the discussions, we are able to have a better understanding of the complexities of approaches in measuring the sustainability in tourism development.

Keywords: assessment tools, indicators, sustainable tourism development

INTRODUCTION

The relationship between environment and tourism has been the subject of considerable debate for the last three decades (Dowling, 2003) in which the elements of sustainable development was started to use with the highly attention towards environmental awareness in the late 1980s (Hunter, 1995) resulted the increases in, the availability and range of holiday types that inferred a greater level of environmental awareness than is associated with mass tourism (Dowling, 2003, p.210). On the other hand, many studies have highlighted tourism-ecology interactions and, in particular, the negative impact of mass tourism on natural and built environments (Farrell and Runyan in Collins, 1999).

Meanwhile, the application of sustainable indicator has been promoted by the World Tourism Organization (WTO) since the early 1990s, as essential instruments for policy-making, planning and management processes at destinations (Hunter, 1995). Since that, the elements of sustainability has been promoted world wide in various fields including tourism. Besides, it have been enforced to be considered in every development stages. Then, a number of arguments and debates concerning sustainable tourism development (STD) have been presented, mostly at a theoretical rather than a practical level (Tae Gyoun Ko, 2005).

However, "what is actually sustained by sustainable development?" (Clayton, 2004). According to Collins (1999), sustainable development "may be interpreted as requiring development to be characterized by intergenerational and intragenerational equity, embracing social justice, cooperation, and global community" (p.99). Moreover, the term sustainable applies to the economic, social and even cultural field although it is most widely used to refer to the maintenance of ecological systems and resources (Clayton, 2004).

Meanwhile in the tourism sector, sustainability poses the question of whether thresholds of tourist numbers and impacts can be defined (Brown, Turner, Hameed & Bateman, 1997). On the other hand, it is often discussed in terms of the balance between economic and environmental concerns (Briguglio & Briguglio, n.d.). As defined by Butler (1999), sustainable tourism is

Tourism which is developed and maintained in an area (community, environment) in such a manner and at such a scale that it remains viable over an infinite period and does not degrade or alter the environment (human and physical) in which it exists to such a degree that it prohibits the successful development and well being of other activities and processes.

On the other hand, the WTO defines sustainable tourism as "tourism which leads to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems" (Neto, 2002). However, "as a concept, sustainable tourism is still evolving" (Clarke, 1997, p.224). Therefore, the application of the concept of sustainable development as an achievable and practical objective for tourism has not yet matured (Ko, 2005, p.431). Moreover, the diversity of views on sustainable tourism and the complexity of the concept have led some tourism academics and practitioners to even question its utility (Middleton and Hawkins in Cernat and Gourdan, 2007). In addition, there are a number of unanswered questions, and a certain amount of

skepticism, concerning the process of sustainability assessment (Ko, 2005).

Therefore, this paper aims to discuss and review on previous studies or practices related with sustainable tourism which comprise on framework, assessment approaches, criteria, indicator and others. Moreover, further discussion on tourism and its sustainability will be focusing in Malaysia.

TOURISM AND ITS SUSTAINABILITY IN MALAYSIA

As a source of foreign exchange, thus tourism seems as an economically important (Briguglio, n.d). The growing number of tourist arrival were resulted in the development of tourist infrastructure, accommodation, recreation centre, transportation and so on as to ensure a high level of satisfaction of tourist during their stay in a destination. Moreover, tourism activities also would benefits local community in term of job opportunity and promote better quality of life. Despite growing number of revenue to local community and business operators, it brings other challenges towards the environment protection which could not consider all of the benefits.

For example, the increased numbers of tourists will have negative effect in it natural resources in which pressure from tourism activities, lead to damage on physical and ecological feature. On the other hand, limited information disclosure and poor monitoring of actions encourage the perpetuation and extension of environmental problems which create potential for tourism to destroy the available common environmental resources through overuse and poor management practices (Karatzoglu & Spilanis, 2010).

As in Malaysia, most of tourism destinations are associated with natural resources like island, sea and beach, forest and cultural heritage as main attractions (Siti Nabiha et al, 2008). Either it exists or proposed, the potential for both positive and undesirable environmental and socio cultural impacts to occur has a great potential (Dowling, 2003). As noted by Coccossis (2004, p. 5) :

Any type of activity usually has impacts of varying kind on a system. The key question is whether these impacts are significant or not, in order to take remedial action or act early in anticipation of impacts. Significance is a matter of relative assessment and this brings up two kinds of question: 'in relation to what?' and 'how much is enough?'

The uncontrolled developments have now shows the impact like water and air pollution, landslides, flashflood, abandoned projects, and so on (Badaruddin Mohamed, Ahmad Puad Mat Som, Jamil Jusoh and Kong, 2006) particularly in Malaysia.

Table 1: List of Study on Tourism Carrying Capacity in Malaysia

Year	Case study	Focus	Organization
1994	Fraser's Hill, Pahang	Physical and social carrying capacity	WWF Malaysia
1995	Sukau, Sabah	Number of boats to Sukau in relation with monkey population	WWF Malaysia
1995	Pulau Tioman, Pahang	Dive tourism	WWF Malaysia
1998	Pulau Payar Marine Park, Kedah	Coral reefs, facilities and socio-economics of tour operators.	Bay of Bengal Programme (BOBP) WWF Malaysia
2002	Pulau Layang Layang	Eco-tourism carrying capacity	Malaysian Nature Society

Source: A review from the National Eco-Tourism Plan by World Wide Fund for Nature (1996)

Large scale development at popular area like Batu Feringghi and Port Dickson were totally transformed the coastal area, resulted in various environmental pollution and close the public access to the beach (Badaruddin Mohamed, 2008). Besides that, Perhentian Island is another beautiful island in Malaysia that facing with problems of infrastructure development, solid waste and sewerage management, coral reef protection and illegal fishing activities (Buletin Projek Pulau Perhentian, 2009). On the other hand, The News Straits Times (February 2, 2010) was discussed on Penang, one of the top island in Malaysia which “is in danger of losing the greenery of hills surrounding the tourist enclave of Batu Feringghi to unbridled development” (p.14).

As a result, various actions have been taken by the respective authority to solve the problem. Moreover, the review has identified that the developments of hotels and other related infrastructure and facilities in Malaysia are mostly based on the projection number of tourist rather on the capacity of the area. For example, the Terengganu state government plans to reduce tourist arrival to Pulau Redang from 200,000 to 160,000, yearly as to protect the coral reef, from being damaged by too many divers as it impacted the ecosystem (The Star, May 3, 2010). Besides, the state government also plans to turn island into a high-end destination to maintain sustainable tourist development on the island (The Star, April 10, 2010). As a result, the carrying capacity concept has been promoted to be used as a tool in managing few destinations in Malaysia.

However, is the capacity becomes the main element for a sustainable tourism development? What is the appropriate methodological framework and indicators for assessing tourism development in Malaysia context?

MEASURING THE SUSTAINABILITY: METHODS AND APPLICATIONS

Previously, the World Wide Fund for Nature (WWF) Malaysia has published a specific guideline to conduct a carrying capacity study in the National Eco Tourism Master Plan in 1997 with specific focus on ecotourism destination. Another carrying capacity study also was published in 2003 by the Town and Country Planning Department (TCPD) in several tourism islands in Peninsular Malaysia namely Langkawi, Tioman, Redang, Sibul and Tinggi. However, the study does not include the real PCC and the Effective or Permissible Carrying Capacity (ECC). Based on the initial review, there are several studies on tourism carrying capacity have been conducted in Malaysia. Most of them have been done by the initiative of non governmental organization (NGO) which has also involving rehabilitation and conservation activities of natural resources. Table 1 shows on the summary of previous research on tourism carrying capacity in Malaysia.

The concept of tourism carrying capacity is one which exemplifies the need to maintain development and activities at a level, both ecologically and socially sustainable (Li, 1998). Primarily it aims to avoid environmental degradation and social conflicts Cazes-Duvat (2001). This technique also would define the limits on tourism development in a place such as size, intensity, and so on (Coccosis, 2004). Also, carrying capacity can be use as a management process in order to ensure that tourism development is carried out within the context and thresholds of optimum level of overall capacity, thus ensuring the long term sustainability of the tourist development (Saveriades, 2000). Once a carrying capacity is determined, it can be used as a helpful tool to make important decisions, but calculating carrying capacity is more complex than one might imagine (Beauline, n.d).

Table 2: Tools of sustainability

Tools	Approach
Area protection	Varying categories of status of protected area -National parks -Wildlife refuges/resources -Biosphere reserves -Country Parks -Areas of outstanding natural beauty -sites of special scientific interest
Industry regulation	Government legislation Professional association regulations International regulation and control Voluntary self-regulation
Visitor management techniques	Zoning Honey pots Visitor dispersion Channeled visitor flows Restricted entry Vehicle restriction Differential pricing structures
Environmental Impact Assessment	Overlays Matrices Mathematical models Cost-benefit analysis The materials balance model The planning balance sheet Rapid rural appraisal Geographic information system Environmental auditing
Carrying Capacity Calculations	Physical Carrying Capacity Ecological Carrying Capacity Social Carrying Capacity Environmental Carrying Capacity
Consultation/ participation technique	Meetings Public Attitude surveys Stated preference surveys Contingent valuation method The Delphi Technique
Codes of conducts	For the tourist For the industry For the hosts Host governments Host communities
Sustainability Indicators	Resource use Waste Pollution Local production Access to basic human needs Access to facilities Freedom from violence and oppression Access to the decision-making process Diversity of natural and cultural life

Source: Mowforth & Munt (2008, p.110-111)

Table 3: A review on method and applications

Method	Destinations/ Country	Description	Source
Tourism Carrying Capacity (TCC)	Hengistbury Head, Britain	This study aims to identify the carrying capacity problems in Hengistbury Head, focusing on two specific criteria; environmental impacts and physical constraints. Also, it analysed and propose some mechanisms for determining, managing, increasing and controlling the environmental carrying capacity of Hengistbury Head.	Simon et al (2004)
Limit of Acceptable Change (LAC)	Punakaiki area on the West Coast of the South Island, New Zealand	This study documented the stakeholders' issues and concerns about each site; collected visitor experience information; evaluate visitors' sensitivity to potential impacts on-site; and develop a list of potential indicators of change at each site, as stated by stakeholders and visitors.	Johnson et al (2001)
	New Zealand's natural areas: A case study on the Mingha-Deception track	It is a framework for visitor management planning which aims to decide how much visitor-induced change (impact) in a natural area is acceptable which include of public participation in decision-making (based on the views and beliefs of stakeholders).	McKay (2006)
Destination Environmental Scorecard (DES)	Greek Islands	It draws on activity-based management concepts and can help local hotel SMEs measure and compare their performance against certain standards and thus conduct operations in a responsible and measurable way to the benefit of both business financial performance and regional sustainability.	Karatzoglu & Spilanis (2010)
Goal programming synthetic indicator (GPSI)	Andalusian Coastal counties	Based on goals provided by users, it facilitates decision making in practical situation by identifying the main characteristics of the different elements, the weaknesses and strengths.	Blancas et al (2010)
The Weaver Model	General	Identification of the most effective and efficient tools for sustainable tourism development in the target areas	Blancas et al (2011)
Distance-principal (DPC) Indicator	Andalusia	Combination of principal component analysis (PCA) and the distance to a reference point concept	Stevens (2002)
Sustainable tourism benchmarking tool (STBT)	Indonesia, Malaysia, Thailand	A framework based on several dimensions (assets, activity, linkages, leakages, sustainability and infrastructure) which enable to draw a descriptive map of the score for individual It allows on addressing specific tourism related issues in developing countries by analyzing various linkages between specific areas.	Cernat and Gourdan (2007)

		It aims to detect the sustainability problems in tourism destination and enable policy makers to make informed decisions and improve the prospects for sustainable tourism in their countries.
Integrated Quality Management (IQM)	EU	It is a process to assist in defining the implementation of sustainable tourism

According to Coccossis and Mexa (2004), acceptable level of component's capacity can be set in terms of: (a) Acceptable level of congestion or density in key areas or spatial units such as parks, museums, city streets, etc. (b) Maximum acceptable loss of natural resources (for example water or land) without significant degradation of ecosystem functions or biodiversity or loss of species. (c) Acceptable level of air, water and noise pollution on the basis of tolerance or the assimilative capacity of local ecosystems. (d) Intensity of use of transport infrastructure, facilities and services. (e) Use and congestion of utility facilities and services of water supply, electric power, waste management of sewage and solid waste collection, treatment and disposal and telecommunications. (f) Adequate availability of other community facilities and services such as those related to public health and safety, housing and community services, etc' (p. 59).

However, some critics on carrying capacity include that it is difficult to be implemented as it is impossible to measure, difficult in predicting impacts, it is neither fixed nor static, and can depend on the speed of change (Head Simon et al, 2004). Moreover, it is an extremely fluid concept fraught with uncertainty like climatic features (Collins, 1999). Besides, carrying capacity is more related to the theoretical frame work rather than the offering an adequate solution for development control (Clark et al., 2002). Thus, this review aims to identify other tools of measurement to achieve a sustainable tourism development.

According to Mowforth & Munt (2008), there are several tools of measuring the sustainability (see Table 2). Meanwhile, study by Stevens (2002) identified few tools that have been developed over the past 25 years to help the tourism industry improve its environmental performance which has been categorized into Codes of Conduct; Operational Manuals; Award Programmes and Competitions; Certification Programmes; Indicators and Benchmarking and Lifecycle Assessment.

Moreover, there are other methods that have been promoted worldwide. Reviews of them have been summarized in Table 3.

CONCLUSIONS

Given the significant role of tourism in the economy and the potential benefits from it, there is a need to ensure that the tourism industry remains both environmentally and economically sustainable (Siti et al). Therefore, it is essential to understand the whole framework of sustainable tourism development such as on how the concept has evolved, what are the objectives, principles or elements that have been taken into account.

Moreover, careful planning and assessment are important parts of sustainable tourism development (United Nations, 2001). It is obvious that some form of assessment is essential to protect the environmental assets on which tourism is planned (Inskip, 1991). On the other hand, the assessment is suggested to be conducted both at planning stage and after development for monitoring.

Even though the concept of sustainable development within tourist environments sounds simple in theory, however, it is difficult to implement for many reasons such as the involvement of many stakeholders with conflicting agenda in any destination (Ioannides, 2003). Besides that, inconsistency and incomparability of figures collected have been identified as a key problems in assessing the scale, importance and impacts of tourism (Mason, 2008).

From the literature review we are able to gain a better understanding of the complexities of approaches in measuring the sustainability, such as carrying capacity, limit of acceptable change, impact assessment and others. Apart of the aforementioned tools, there are many other tools to measure the sustainability of tourism development. Each tools has its own strength and weaknesses and suitable to be implemented for certain destinations. Therefore, in depth discussion is perhaps to be conducted in future to identify other tools of measurement.

Although it is just a review, perhaps it would contribute to the protection of the environment and assisting in developing a comprehensive protection measure of tourist destinations particularly in Malaysia as well as to improve the quality of life of the host community and provide higher quality of experience for the visitors.

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REFERENCES

- [1] Badaruddin Mohamed, Ahmad Puad Mat Som, Jamil Jusoh, & Kong, Y. W. (2006). Island Tourism in Malaysia the Not So Good News. In: 12th Asia Pacific Tourism Association & 4th Asia Pacific CHRIE Joint Conference, 26-29 June 2006, Hualien, Taiwan. Retrieved from http://eprints.usm.my/view/divisions/sch_hbp.htmlBookmark
- [2] Badaruddin Mohamed (2008). *Pelancongan Lestari*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- [3] Blancas, F.J, Caballero, R, González, M. Lozano-Oyola, M. & Pérez, F. (2010). Goal programming synthetic indicators: An application for sustainable tourism in Andalusian coastal counties. *Ecological Economics*, 69, 2158–2172.
- [4] Briguglio, L & Briguglio, M. (n.d.). Sustainable Tourism In Small Islands The Case Of Malta. (p.1-12).
- [5] Brown, K., Turner, R.K., Hameed, H & Bateman, I. (1997). Environmental carrying capacity and tourism development in the Maldives and Nepal. *Environmental Conservation* 24 (4): 316–325.
- [6] Buletin Projek Pulau Perhentian. (2009). Pemuliharaan Terumbu Karang di Pulau Perhentian melalui Tindakan usahawan dan komuniti. Retrieved from http://www.perhentianisland.org/wp-content/files/Buletin_Mei2009.pdf
- [7] Butler, R.W. (1999). Sustainable tourism: A state-of-the-art review. *Tourism Geographies*, 1:1, 7-25.
- [8] Cazes-Duvat, V. (2001). Methodologies for carrying capacity in small island states / Indian Ocean. Retrieved from <http://www.csiwisepactices.org/?review=380>
- [9] Cernat, L & Gourdan, J. (2007). Is the concept of sustainable tourism sustainable? Developing the sustainable tourism benchmarking tool. Paper presented at United Nations Conference on Trade and Development
- [10] Clarke, J. (1997). A framework of approaches to sustainable tourism. *Journal of Sustainable Tourism*. 5: 3, 224 — 233. Doi: 10.1080/09669589708667287
- [11] Coccossis, H. & Mexa, A. (2004). *The challenges of tourism carrying capacity assessment: Theory and practice*. England: Ashgate Publishing Limited.
- [12] Coccossis, H. (2004). Sustainable Tourism and Carrying Capacity: A New Concept, In: Coccossis, H. & Mexa, A. (Eds.). *New Direction in Tourism Analysis. The Challenge of Tourism Carrying Capacity Assessment Theory and Practice* (P. 3-15). Berlington: Ashgate Publishing Limited
- [13] Collins, A. (1999). Tourism Development And Natural Capital. *Annals of Tourism Research*, 26, (1), pp. 98-109. Retrieved from <http://www.sciencedirect.com/science?>
- [14] Dalal-Clayton, B. (2004). What is sustainable development? Retrieved from <http://www.nssd.net/pdf/sustdev2.pdf>
- [15] Dowling, R.K. (2003). Community attitudes: tourism development in natural environments. In Shalini sikh, Dallen J. Timothy and Ross K. Dowling (Eds.), *Tourism in Destination communities*, 205-228. Oxon and Cambridge: CABI Publishing
- [16] Hunter, C. (1995). Key concepts for tourism and the environment. In Hunter, C. & Howard, G., *Tourism and the environment: a sustainable relationship?* (p. 52-86). Michigan: Routledge.
- [17] Inskip, E. (1991). *Tourism Planning an Integrated and Sustainable Development Approach*. Canada, John Wiley & Sons.
- [18] Ioannides, D. (2003). The economics of tourism in host communities. In Shalini Singh. Dallen j.timothy, Dowling, K. (Eds.), *Tourism in destination communities*. CABI Publishing, 37-54.
- [19] Jabatan Perancang Bandar dan Desa (*Town and Country Planning Department*). (2005a). *Piawaian perancangan: Pembangunan fizikal pulau-pulau*. Kuala Lumpur: Kementerian Perumahan dan Kerajaan Tempatan.
- [20] Jabatan Perancang Bandar dan Desa (*Town and Country Planning Department*). (2005b). *Laporan tahap tampungan dan garis panduan pembangunan Pulau Tinggi*. Kuala Lumpur: Kementerian Perumahan dan Kerajaan Tempatan.
- [21] Johnson, V., Ward, J., & Hughey, K. (2001). *A study of visitors' and stakeholders' concerns about three natural attractions in the Paparoa area, West Coast, South Island, New Zealand*.
- [22] Karatzoglu, B & Spillanis, I. (2010). Sustainable Tourism in Greek islands: the Integration of Activity-Based Environmental Management with a Destination Environmental Scorecard Based on the Adaptive Resource Management Paradigm. *Business Strategy and the Environment*, 19, 26–38. DOI: 10.1002/bse.627
- [23] Ko, T.G. (2005). Development of a tourism sustainability assessment procedure: a conceptual

- approach. *Tourism Management*, 26. 431–445. doi:10.1016/j.tourman.2003.12.003.
- [24] Li, C.L. (1995). Framework guidelines for assessing carrying capacity. (Appendix 1). Retrieved from <http://www.fao.org/docrep/x5626e/x5626e0e.htm>
- [25] MacLeod, M. & Cooper, J.A.G. (2005). *Carrying Capacity in Coastal Areas*. In M. Schwartz. (Ed.). p.226. DOI: 10.1007/1-4020-3880-1.
- [26] Mason, P. (2008) *Tourism Impacts, Planning and Management* Author
- [27] Mowforth, M & Munt I. (2008). *Tourism and sustainability: new tourism in the third world*. London: Routledge. Retrieved from <http://books.google.com.my/books?id=ULR6fbdSxvgC&printsec=frontcover#v=onepage&q&f=false>
- [28] McKay, H. (2006). *Applying the Limits of Acceptable Change Process to Visitor Impact Management in New Zealand's Natural Areas*. Lincoln University.
- [29] Neto, F. (2002). *Sustainable Tourism, Environmental Protection and Natural Resource Management: Paradise on Earth?* Retrieved from <http://www.mtnforum.org/sites/default/files/pub/1423.pdf>
- [30] Retrieved from <http://www.mtnforum.org/sites/default/files/pub/1423.pdf>
- [31] The News Straits Times (February 2, 2010). *Paradise that's rapidly losing green lustre*. (p.14)
- [32] Priority Actions Programme. (1999). *Carrying capacity assessment for tourism development. Coastal Area Management Programme (CAMP) Fuka-Matrouh, Egypt*. Retrieved from <http://www.pap-thecoastcentre.org/pdfs/CCA%20for%20Tourism%20Development.pdf>
- [33] Saveriades, A. (2000). Establishing the social tourism carrying capacity for the tourist resorts of the east coast of the Republic of Cyprus. *Tourism Management*, 21, (p.147-156).
- [34] Simon, H et al. (2004). Carrying capacity in the tourism industry: a case study of Hengistbury Head. *Tourism Management*, 25, 275–283.
- [35] Siti-Nabiha, A.K, N. Abdul Wahid, A. Amran, H. Che Haat and I. Abustan. (2008). *Towards A Sustainable Tourism Management In Malaysia*. *Lex ET Scientia International Journal - Juridical Series*. 301-312. Retrieved from <http://lexetscientia.univnt.ro/en/article/TOWARDS-A-SUSTAINABLE-TOURISM-MANAGEMENT-IN-MALAYSIA~225.html>
- [36] Stevens, T. (2002). *Sustainable Tourism in National Parks and Protected Areas: An Overview*. Scottish Natural Heritage. Retrieved from xxx
- [37] The Star. (May 3, 2010). *Terengganu plans to reduce tourist arrivals to Pulau Redang*. Retrieved from <http://thestar.com.my/news/story.asp?sec=nation&file=/2010/5/3/nation/20100503193134>
- [38] The Star. (April 10, 2010). *Tourism Ministry gives the thumbs-up on high-end Redang*. Retrieved from <http://thestar.com.my/news/story.asp?sec=nation&file=/2010/4/10/nation/6028886>
- [39] World Wide Fund for Nature (WWF). (1996). *National Eco-Tourism Plan*. Retrieved from http://www.motour.gov.my/bm/perkhidmatan/maklumat-am/muat-turun-borang/cat_view/60-pelan-eko-pelancongan-kebangsaan--national-eco-tourism-programme.html