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## **Are environmentally responsible behaviours shaped by environmental facilitating conditions and antecedent of attitudes? The case of Perak in Malaysia**

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**Abstract:** This research attempts to present the notion of understanding through the empirical studies on environmentally responsible behaviour for strategies development with an emphasis on the role of facilitating conditions. A total of 263 usable questionnaire responses were collected for data analysis. The major findings show that environmental concern and environmental knowledge are important for environmental attitude in order to cultivate the environmentally responsible behaviour among tourists. Conversely, environmental facilitating conditions are directly related to environmentally responsible behaviour instead of having the moderating effect on environmental attitude. This study contributed in reassuring the tourists' participation in the environmentally responsible behaviour with commitment in environmental concerns and interest in knowledge towards environmental and sustainability issues while visiting natural sites.

**Keywords:** environmentally responsible behaviour; environmental attitudes; environmental concern; facilitating conditions; ecotourism.

**Reference** to this paper should be made as follows: Seow, A.N., Choong, Y.O., Lau, L.S., Choong, C.K., Loh, C.T., Go, Y.H., Ching, S.L. and Yii, K.J. (2020) 'Are environmentally responsible behaviours shaped by environmental facilitating conditions and antecedent of attitudes? The case of Perak in Malaysia', *Int. J. Environment and Sustainable Development*, Vol. 19, No. 3, pp.269–283.

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This paper is a revised and expanded version of a paper entitled 'Are environmentally responsible behaviours shaped by environmental facilitating conditions and antecedents of attitudes? The case of Perak in Malaysia', presented at CSSR 2017, The Pines Hotel, Melaka, 6–7 December 2017.

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## **1 Introduction**

The issue of environmental degradation has become a major concern in recent years. Developing countries are faced with the dilemma of whether to expand the economy rapidly or to protect the environment. As a developing nation, harbouring the significance of biodiversity and social-cultural resources may have substantial development issues that pressures Malaysia. In this regard, integrating conservation and ecologically sustainable development of natural sites is a major challenge. Key issues include inadequate knowledge and concern, poor regulatory and planning processes and a lack of adequate facilities. In order to ensure that the natural resources do not experience deprivation in the process of environmental protection, it is vital for visitors to possess responsible behaviour to protect the areas sustainably (Gera, 2016). Consequently, proper planning and management of natural resources are essential to prevent adverse impacts on the natural environment. In Malaysia, several important action plans have been taken by the government over the years when it comes to protecting the natural environment and natural resources. Among the obligations are: establishing protected areas and guidelines; promoting sustainable development; and developing a national plan (such as the National Policy on Biological Diversity 2016–2025) for biodiversity conservation (Ministry of Natural Resources and Environment, 2017). With an abundance of natural attractions and the world's most beautiful mountains, caves, mangrove and tropical forests, Perak has the potential to become one of the ideal natural environmental destinations for ecotourism in Malaysia. For instance, the establishment of the Royal Belum State Park was first officially considered as protective land by the Perak state government in 1971 (Suksuwan and Kumaran, 2003). The preservation and protection of the natural environment are also prioritised in every five-year development plan as special policies and regulations are designed to ensure proper development of a sustainable environment and its protection (Bhuiyan et al., 2015).

Nevertheless, despite continuous efforts made in preserving natural areas in Malaysia, many ecological destinations are still suffering from environmental degradation, which may be due to a lack of awareness and audits on environmental issues (Masud and Kari, 2015). For instance, poorly regulated visitors and human-wildlife conflict are particular major issues that threaten the Royal Belum State Park in the state of Perak, as indicated by World Wide Fund for Nature (WWF). Furthermore, the official closure of Pulau Sembilan, the island which was famous for the unique 'blue tears' of seawater that appear at night, was due to excessive visitation that destroyed the natural settings of the island (Asean Breaking News, 2017). Seemingly, there is lack of environmentally responsible behaviour in preserving and protecting the natural environment while carrying out activities at natural environment destinations. Although Malaysia has undergone excellent development followed by governmental efforts to attract foreign investors to invest in natural environment protection in Malaysia, the practices of environmentally responsible behaviour are still scarce (Masud et al., 2014). The visitation by environmentally irresponsible visitors at tourist sites incurs tremendous pressures to the natural environment at the site. For example, the action of throwing rubbish in natural sites may lead to environmental degradation. In order to inculcate the ethics of visitation, proper management is required to regulate visitors with the aim of nature conservation (Steward et al., 2017). Thus, there should be greater environmental concern and knowledge of the need to conserve the natural environment. In addition, it is

necessary to identify the antecedents of such attitudes on environmentally responsible behaviour. Thus, this research attempts to present the notion of understanding between the empirical study of a natural environmental approach and the realities of tourists' environmentally responsible behaviour on strategies developed by the government.

The concept of environmentally responsible behaviour has been widely discussed in previous literature (Lu et al., 2016; Su and Swanson, 2017). Most existing literature has focused on identifying measures to reduce the adverse impacts of visiting attraction activities (Chiu et al., 2014) and assessing the behaviour that is harmful to the environment as well as behaviour that enables environmental protection (Chiu et al., 2014). Chan and Lee (2016) explore the influence of both personal (values and attitude) and environmental factors (social influences and facilitating conditions) on environmental beliefs among Malaysian consumers. With the growing availability of government support for operation equipment and resource factors, the absence of the required environmental facilitating resources could result in an obstacle to the environmental practice. Hence, there is a research gap to identify the importance of the moderating effect from environmental facilitating conditions as indispensable pre-requisites to enhance the performance of environmentally responsible behaviour. This study draws on the conceptual framework from social cognitive theory (SCT) (Bandura, 2004), which was evolved from social learning theory by Albert Bandura. SCT posits a multifaceted causal structure in the regulation of human motivation, action and well-being whereby there is a continuous dynamic interaction between the individual, environment and behaviour. The primary argument of SCT is that the behavioural intention of an individual consists of cognitive, personal and environmental factors besides behaviour. Most importantly, SCT can probe an avenue to further develop an understanding of the factors influencing environmentally responsible behaviour. This study attempts to identify the factors influencing environmentally responsible behaviour through the effects of antecedents of environmental attitudes. Specific beliefs such as environmental concern and knowledge of environmental issues coupled with environmental facilitating conditions could reveal important implications for designing an effective behavioural change intervention in the future. In view of the above, several research questions are proposed as follows.

Research questions:

- 1 How environmental concern and environmental knowledge are positively related to environmental attitudes?
- 2 How environmental attitude is positively related to environmentally responsible behaviour?
- 3 How facilitating conditions moderate the relationship between environmental attitude and environmentally responsible behaviour?

### *1.1 Environmentally responsible behaviour*

Environmentally responsible behaviour (ERB) is formally defined as:

“A state in which a person expresses an intention to take action directed toward remediation of environmental problems, acting not as an individual consumer with own economic interests, but through a citizen consumer concept of societal-environmental well-being. Further, this action will be characterised by

skills in pursuing personal chosen action, and possession of a genuine desire to act after having weighed own the locus of control and determining that these actions can be meaningful in alleviating the problem.” (Stone et al., 1995)

From the perspective of tourists’ environmentally responsible behaviour, it refers to protecting the natural environment and minimising interference in the local environment and taking steps to reduce degradation in a particular destination (Han et al., 2016). In some cases, tourists may not be aware that their behaviour is harmful to the natural environment of the destination visited (Liobikienė and Juknys, 2016). Thus, it is vital to cultivate environmentally responsible behaviour among tourists to avoid damage to the ecosystem of the natural environment.

### *1.2 Environmental concern*

Environmental concern can also be known as an attitude towards a general or specific environmental issue (Newman and Fernandes, 2016). Sapci and Considine (2014) concluded that a person who is environmentally concerned will have a greater tendency to have a behaviour that is more environmentally friendly. According to Gifford and Nilsson (2014), individuals who have higher environmental concern are discovered to have a greater tendency to engage in pro-environmental activities such as recycling and petitioning. It is shown by Juvan and Dolnicar (2014) that visitors who are concerned with environmental issues will undergo a psychological guilt or stress when they do not follow through on these concerns in their attitudes and behaviour. Hence, the following hypothesis is formed:

H1 Environmental concern is positively related to environmental attitudes.

### *1.3 Environmental knowledge*

Environmental knowledge refers not only to knowledge of environmental problems, but also the capability to combine it with the individual learning process in a holistic manner (Ramdas and Mohamed, 2014). Knowledge of environmental issues means that the individual is well-versed on environmental problems and their causes (Kollmuss and Agyeman, 2002). When people have knowledge of what is happening, they tend to have a sense of moral obligation, which will provoke a positive change of behaviour (Gadenne et al., 2011). Masud et al. (2017) concluded, in their empirical findings, that there is an association between environmental knowledge for sustainable development and the intention to participate in community-based ecotourism. In this study, we presumed people who have a higher general environmental knowledge, such as ecotourists, could be more empathetic to environmental issues and engage in ERB (Monroe, 2003). Thus, the following hypothesis is proposed:

H2 Environmental knowledge is positively related to environmental attitudes.

### *1.4 Environmental attitudes*

The concept of environmental attitudes refers to the attitude towards protection of the environment. It can be defined as an overall assessment and beliefs organised for different aspects of the environment (Papagiannakis and Lioukas, 2012). Cassells and

Lewis (2011) posit that being environmentally responsible is a synonym for being ecologically responsible. The level of ecological sensitivity relies on the interplay between both attitudes and behaviour. A pro-environmental attitude is one of the traits that must be observed in individuals who are environmentally responsible (Hannibal et al., 2016). Hence, environmental attitudes are found to be related and are important in deciding a person’s environmentally responsible behaviours (Takahashi and Selfa, 2014). Based on the above discussion, it is hypothesised that:

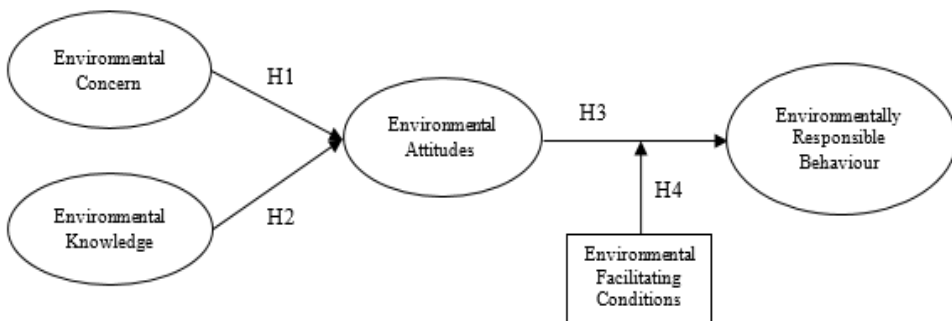
H3 Environmental attitude is positively related to environmentally responsible behaviour.

1.5 The moderating effect of environmental facilitating conditions

There are external factors that are related to the environmental behaviour in question, namely the availability of options and infrastructure, as well as the degree of determination needed (Arbuthnott, 2009). Factors such as environmental facilitating conditions reflect the availability of facilitating resources needed to perform environmentally responsible behaviours (Seow et al., 2017). For instance, the authorities must determine the site locations for waste disposal, selecting human waste disposal systems, supplying water requirements for the flora and fauna in protected areas, and choosing soiled waste disposal alternatives, etc. Indeed, with the growing availability of government support for operation equipment and resource factors such as administrative and financial management (resources of facilitating conditions), environmentally responsible behaviour will also become increasingly manageable. The absence of the required environmental facilitating resources could present a barrier to practice and to the establishment of actual intention (Entrialgo and Iglesias, 2016). In order to practice environmentally responsible behaviour, tourists need to have environmental facilitating conditions made available in terms of environmental facilitating resources. With this, it is expected that the presence of environmental facilitating conditions, provided by the authorities as moderators, are likely to result in a higher level of environmentally responsible behaviour. We therefore hypothesise that:

H4 Environmental facilitating conditions can significantly moderate the relationship between environmental attitude and environmentally responsible behaviour.

Figure 1 The conceptual framework



## **2 Research methodology**

### *2.1 Research design*

This study was based upon a quantitative technique whereby a self-administered survey method was used for data collection. The targeted sample was tourists who visited natural environment destinations in Perak, Malaysia. The field survey was conducted in several ecotourism destinations such as lakes, gardens, beaches, caves, mountains, mangrove swamp parks and recreational parks in Perak. Since the majority of the tourists were multiracial, three common different versions of questionnaires were designed by using a back-to-back translation method. Five well-trained research assistants were recruited and assigned to different field study locations to collect data. A quota sampling technique was adopted. Five hundred sets of questionnaires were distributed to the targeted respondents. Out of the samples, 263 usable samples were returned and another 52 samples were discarded from the dataset, which yielded a 53% response rate. The majority of the tourists were females (60.1%,  $n = 158$ ), while 39.9% were males ( $n = 105$ ). In terms of age group, 38.4% of the samples were aged 21–30 years old, followed by the age group below 21 years old (25.2%), 31–40 years old (17.9%), 41–50 years old (12.5%), 51–60 years old (5.3%) and over 60 years of age (0.8%). For the distribution of religion, 10.6% were not attached to any religion, 6.5% were Muslims, 8% were Hindus or Sikhs, 13.3% were Christians and 60.8% were Buddhists or Taoists. One hundred and fifty-two tourists were diploma or degree holders. For occupation characteristics, the largest group were students (51.7%,  $n = 136$ ), while the majority of tourists (66.2%,  $n = 174$ ) were earning less than 20,000 Malaysian ringgit (local currency of Malaysia).

### *2.2 Measurement and research instruments*

Environmental concern was operationalised by adapting a two item scale from Kilbourne and Pickett (2008) and a three item scale from Bamberg (2003). Environmental knowledge was measured with a five item scale developed by Kaise et al. (1999). The measurement of environmental attitudes were adapted from Stone et al. (1995) and Lee (2011), which comprised of five items, whereas the items of environmental facilitating conditions were derived by the authors of this study. Lastly, environmentally responsible behaviour was originally developed by Kerstetter et al. (2004) and consists of a six item scale. All the items were measured using five-point Likert scales anchored by strongly disagree representing one and strongly agree representing five. The questionnaire was designed and divided into two sections: Section A consisted of questions related to respondents' personal profile, whereas Section B consisted of 26 questions measuring each construct of the study. Prior to the assessment of the measurement model, a Harman's single factor test was conducted to ensure the data were free from common method bias due to the use of a self-reporting questionnaire, whereby the predictor variables and criterion variables were answered by the same group of respondents. There was no common method bias existing in the self-reported survey as the first factor accounted for less than 50% of the variance, which was less than the threshold value of 50% (Podsakoff et al., 2003).

### 3 Data analysis

A two-stage analytical approach was adopted to conduct structural equation modelling by using Smart PLS version 3 software. The partial least squares structural equation modelling approach (PLS-SEM) was adopted instead of the ordinary least squares approach as PLS-SEM was able to test the moderating effect. The measurement model was assessed to examine the construct validity which was comprised of convergent validity and discriminant validity. The structural model was tested by using a bootstrapping technique with 5,000 resamples. In order to examine the proposed hypotheses, the path coefficient and t-statistics were generated, whereas the coefficient of determination was determined to check the explanatory power of the antecedents of the constructs on the endogenous construct: environmentally responsible behaviour. Apart from this, a blindfolding technique was also conducted to obtain cross-validated redundancy, which is also known as the predictive relevance of the endogenous construct.

#### 3.1 Measurement model

The composite reliabilities for environmental concern (0.863), environmental knowledge (0.851), environmental attitudes (0.887), environmental facilitating conditions (0.813) and environmentally responsible behaviour (0.800) were considered very good as they exceeded the minimum threshold value of 0.700 as specified by Hair et al. (2016). The convergent validity of the measurement model was assessed by examining factor loadings and average variance extracted (AVE) of each latent construct. At least 80% of the item loadings exceeded the minimum cut-off value of 0.700. However, there were several items that fell in between 0.500 and 0.700 loadings, which were retained as the AVE exceeded the recommended value of 0.500 (Fornell and Larcker, 1981). Consequently, one item from environmental attitude (EA5), one item from environmental facilitating conditions (EFC5) and two items from environmentally responsible behaviour (ERB1 and ERB4) were discarded from the measurement model as the loadings were too low. The AVE of each construct was in the range of 0.509 and 0.662, which exceeded the recommended value of 0.500 (Fornell and Larcker, 1981). Based on the convergent validity assessment result, convergent validity was established.

The discriminant validity of the measurement model was determined through Fornell and Larcker's (1981) method and cross loadings (Hair et al., 2014). This indicated that the square root of the AVE for each construct was larger than the rest of the correlations between constructs. In addition to this, the cross loadings of each measured variable items were at least 0.100 higher than the cross-loading items or loadings of other constructs. In view of the discriminant validity result, the discriminant validity of the measurement model was adequately fulfilled.

Prior to the assessment of the structural model, several control variables were included which allow the relationship between variables being tested to be better understood. The control variables included and tested were gender, age group, income level and education level, where there were no significant influences of these variables on the endogenous construct, i.e., environmentally responsible behaviour.



3.2 Assessment of structural model and discussion

The significance test was performed by conducting a bootstrapping technique with 5,000 resamples. Table 1 reveals the structural equation modelling result of the proposed research model. It indicates that environmental knowledge was positively related to environmental attitudes ( $\beta = 0.619, p < 0.05, t = 10.036$ ). This result was in line with the research by Taufique et al. (2016) and Wanga et al. (2013), which found that environmental knowledge positively affects environmental attitudes. This result was also consistent with Masud et al. (2017) and Monroe (2003), where an individual with good knowledge regarding current environmental issues would have a greater tendency to engage in environmentally responsible behaviour.

Similarly, it was also found that environmental concern was positively related to environmental attitudes ( $\beta = 0.169, p < 0.05, t = 2.753$ ). This result corresponds with the findings of Hassan et al. (2010) that there is a significant positive relationship between environmental concern and attitude, and which suggested that environmental concern is a potential variable in affecting recycling behaviour. This result was also supported by Juvan and Dolnicar (2014) and Puhakka (2011). An individual who is concerned about the seriousness of environmental issues would be more responsible toward the environment, which would further encourage him or her to exhibit environmentally responsible behaviour. However, the value of the path coefficient and t-statistics posited that environmental concern was a stronger predictor of environmental attitudes as compared to environmental knowledge.

Meanwhile, environmental attitudes were also statistically shown to be positively related to environmentally responsible behaviour. This result was consistent with Casaló and Escario (2018), Wang et al. (2018) and Duarte et al. (2016) who posited that attitudes towards the environment could help to shape environmentally responsible behaviour. The result was also in line with Polonsky et al. (2014), Takahashi and Selfa (2014) and Lee et al. (2013). It is to be noted that the environmental facilitating conditions did not significantly moderate the relationship between environmental attitudes and environmentally responsible behaviour. As such, it can be concluded that Hypotheses H1, H2 and H3 are supported, whereas Hypothesis H4 is not supported.

**Table 1** Structural equation modelling results

Hypothesis	Path	Beta	Standard error	t-statistics	Results	Q2	R2
H1	EC -> EA	0.619	0.062	10.036	Supported	0.345	0.549
H2	EK -> EA	0.169	0.061	2.753	Supported		
H3	EA -> ERB	0.725	0.137	5.280	Supported	0.197	0.435
H4	EA * EFC -> ERB	-0.271	0.246	1.104	Not supported		

As illustrated in Table 1, environmental concern and environmental knowledge jointly explained 54.9% of the variance in environmental attitudes, while environmental attitudes were able to explain 43.5% of the variance in environmentally responsible behaviour. The predictive power for both endogenous constructs, environmental attitudes and environmentally responsible behaviour are considered as substantial, exceeding the

substantial minimum threshold value of 0.35 (Cohen, 1988). For predictive relevance, this could be done through blindfolding procedures where the omission distance was set at the value of seven. Table 1 shows that both endogenous constructs, environmental attitudes and environmentally responsible behaviour exceeded zero; thus, it is confirmed that the structural model had good predictive relevance.

## **4 Implications**

### *4.1 Theoretical implications*

The results of our study have three important theoretical implications. First, SCT provides a framework for understanding how tourists are shaped by their environment. In particular, the theory provides details on the processes of tourists' environmental attitudes with the influence of environmental concern and knowledge as well as environmental facilitating conditions on environmentally responsible behaviour. Hence, the main implication of this environmental research is that tourists should be aware of the high variety of commitment and interest among them towards environmental and sustainability issues, when visiting natural sites. Sensitivity to environmental issues shifts tourists' behaviour towards supporting the growth and diffusion of environmental issues and publicising ecologically conscious behaviour.

Second, it is found from our results that both environmental knowledge and environmental concern are positively linked to environmental attitudes. Specifically, environmental concern has a greater positive impact on environmental attitudes as compared to environmental knowledge. Our study is the first that considers how environmental knowledge and concern affect environmental attitudes using SCT, particularly in the context of the ecotourism industry in Perak, Malaysia.

Third, our study has another essential theoretical contribution in the sense that environmental attitudes are revealed to have a positive relationship with environmentally responsible behaviour. Moreover, environmental facilitating conditions do not moderate the relationship between environmental attitudes and environmentally responsible behaviour. Studies on these relationships have been absent in the literature concerning the ecotourism sector in Perak, Malaysia.

### *4.2 Practical implications*

The results of this study have essential practical implications for policymakers in enhancing environmentally responsible behaviour among tourists. With the understanding of major determinants of environmentally responsible behaviour in Perak, Malaysia, the government and policymakers are able to conserve the natural environment in a proper manner with the conscious effort of relevant parties. Ecotourists and individuals should gain concern about the relevant environmental issues and in turn, be willingly involved in the environmental improvement and protection plan. Greater awareness of environmental problems, increased media coverage and the rise of pressure group activities are among the factors driving environmental concerns and subsequently, knowledge of environmental issues. Hence, environmental knowledge has to be made capable of addressing the different awareness, attitudes and behaviours of tourists in a differentiated, targeted and effective way in the future.

Additionally, the Perak state government should focus strongly on environmentally responsible campaigns in natural environmental destinations. However, the implementation of such policies at these natural sites needs to be supported by an effective, integrative approach involving natural resource regulation, conservation and the improvement of local communities' participation. Further, the Ministry of Tourism and Culture in Malaysia is encouraged to financially support these environmental campaigns. The availability of regional tourism authorities and environmental facilities' providers is also essential for providing relevant information regarding environmental protection as part of the government's efforts in reducing environmental problems. Moreover, the government could encourage foreign investment in ecotourism related projects. Most importantly, this might also provide local communities with the opportunities to be involved in business activities related to ecotourism.

### *4.3 Managerial implications*

Our study also provides vital managerial implications for the ecotourism industry. With environmental knowledge found to be an important determinant for environmental attitudes, managerial attention must be focused on providing adequate environmental information to the public so that people's knowledge of environmental protection can be enhanced. In relation to this, business players in the ecotourism industry in Perak should work hand in hand with the government in designing and implementing appropriate programs such as talks on improving environmental knowledge among tourists. As environmental attitudes positively influence environmentally responsible behaviour, it is also advisable for the decision makers to gradually increase the emphasis on environmental education and awareness campaigns in the construction of environmental attitudes among tourists.

Although comprehensive constructs were used to scrutinise tourists' environmentally responsible behaviour, this study suggests the use of behavioural-based interview methods to further explore the actual behaviour among ecotourists. On the other hand, it is believed that the environmental facilitating resources at the nature sites very much depend on the tourism management and effectiveness of the local authorities. To overcome these limitations, future studies should consider the responses from tourism stakeholders and local communities in preserving the natural environment.

## **5 Conclusions**

Although different initiatives have been taken by the government to protect the environment, it is challenging to ensure that there is no deprivation on natural resources during the process of environmental protection. To identify the actual environmentally responsible behaviour of tourists, this study provides inclusive understanding of its major determinants based on SCT. This study allows us to know, in an in-depth manner, what efforts need to be taken in order to provide motivations towards environmental protection. Beside the environmental concern, knowledge on environmental issues does have a significant effect on tourists' attitudes towards environmentally responsible behaviour. On the other hand, facilitating conditions are directly related to environmentally responsible behaviour instead of having a moderating effect to enlighten

the role of the government in conserving the natural environment. Hence, more information needs to be disseminated through awareness campaigns among tourists regarding how to be more environmentally responsible.

## Acknowledgements

This research is supported by the Fundamental Research Grant Scheme (FRGS) (Ref: FRGS/1/2017/SS08/UTAR/03/1), Ministry of Higher Education (MOHE), Malaysia.

## References

- Arbuthnott, K. (2009) 'Education for sustainable development beyond attitude change', *International Journal of Sustainability in Higher Education*, Vol. 10, No. 2, pp.152–163.
- Asean Breaking News (2017) *Pulau Sembilan Closed to Visitors* [online] <https://www.aseanbreakingnews.com/2017/03/pulau-sembilan-closed-to-visitors/> (accessed on 10 September 2017).
- Bamberg, S. (2003) 'How does environmental concern influence specific environmentally related behaviors? A new answer to an old question', *Journal of Environmental Psychology*, Vol. 23, No. 1, pp.21–32.
- Bandura, A. (2004) 'Health promotion by social cognitive means', *Health Education & Behavior*, Vol. 31, No. 2, pp.143–164.
- Bhuiyan, M.H., Siwar, C. and Ismail, S.M. (2015) 'Sustainability measurement for ecotourism in Malaysia: a study on Lake Kenyir, Terengganu', *Social Indicators Research*, Vol. 128, No. 3, pp.1029–1045.
- Casaló, L.V. and Escario, J.J. (2018) 'Heterogeneity in the association between environmental attitudes and pro-environmental behaviour: a multilevel approach', *Journal of Cleaner Production*, Vol. 175, pp.155–163.
- Cassells, S. and Lewis, K. (2011) 'SMEs and environmental responsibility: do actions reflect attitudes?', *Corporate Social Responsibility and Environmental Management*, Vol. 18, No. 3, pp.186–199.
- Chan, S.K. and Lee, F.N. (2016) 'The influence of personal and environmental factors on ecological beliefs', *Journal of Global Business and Social Entrepreneurship*, Vol. 1, No. 5, pp.9–19.
- Chiu, Y.T.H., Lee, W.I. and Chen, T.H. (2014) 'Environmentally responsible behaviour in ecotourism: antecedents and implications', *Tourism Management*, Vol. 40, pp.321–329.
- Cohen, J. (1988) *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed., Lawrence Erlbaum Associates, Hillsdale, NJ.
- Duarte, R., Escario, J.J. and Sanagustín, M.V. (2016) 'The influence of the family, the school, and the group on the environmental attitudes of European students', *Environment Education Research*, Vol. 1, No. 1, pp.23–42.
- Entrialgo, M. and Iglesias, V. (2016) 'The moderating role of entrepreneurship education on the antecedents of entrepreneurial intention', *International Entrepreneurship and Management Journal*, Vol. 12, No. 4, pp.1209–1232.
- Fornell, C. and Larcker, D.F. (1981) 'Structural equation models with unobservable variables and measurement error: algebra and statistics', *Journal of Marketing Research*, Vol. 18, No. 3, pp.382–388.

- Gadenne, D., Sharma, B., Kerr, D. and Smith, T. (2011) 'The influence of consumers' environmental beliefs and attitudes on energy saving behaviours', *Energy Policy*, Vol. 39, No. 12, pp.7684–7694.
- Gera, W. (2016) 'Public participation in environmental governance in the Philippines: the challenge of consolidation in engaging the state', *Land Use Policy*, Vol. 52, pp.501–510.
- Gifford, R. and Nilsson, A. (2014) 'Personal and social factors that influence pro-environmental concern and behaviour: a review', *International Journal of Psychology*, Vol. 49, No. 3, pp.141–157.
- Hair Jr., J.F., Hult, G.T.M., Ringle, C. and Sarstedt, M. (2016) *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, Sage Publications, Thousand Oaks.
- Hair Jr., J.F., Sarstedt, M., Hopkins, L. and Kuppelwieser, V.G. (2014) 'Partial least squares structural equation modeling (PLS-SEM) an emerging tool in business research', *European Business Review*, Vol. 26, No. 2, pp.106–121.
- Han, J.H., Lee, M.J. and Hwang, Y.S. (2016) 'Tourists' environmentally responsible behaviour in response to climate change and tourist experiences in nature-based tourism', *Sustainability*, Vol. 8, No. 7, pp.644–657.
- Hannibal, B., Liu, X. and Vedlitz, A. (2016) 'Personal characteristics, local environmental conditions, and individual environmental concern: a multilevel analysis', *Journal of Environmental Sociology*, Vol. 2, No. 3, pp.286–297.
- Hassan, A., Noordin, T.A. and Sulaiman, S. (2010) 'The status on the level of environmental awareness in the concept of sustainable development amongst secondary school students', *Social and Behavioural Sciences*, Vol. 2, No. 2, pp.1276–1280.
- Juvan, E. and Dolnicar, S. (2014) 'The attitude-behaviour gap in sustainable tourism', *Annals of Tourism Research*, Vol. 48, pp.76–95.
- Kaise, F.G., Wolfing, S. and Fuhrer, U. (1999) 'Environmental attitude and ecological behavior', *Journal of Environmental Psychology*, Vol. 19, pp.1–9.
- Kerstetter, D.L., Hou, J.S. and Lin, C.H. (2004) 'Profiling Taiwanese ecotourists using a behavioral approach', *Tourism Management*, Vol. 25, No. 4, pp.491–498.
- Kilbourne, W. and Pickett, G. (2008) 'How materialism affects environmental beliefs, concern, and environmentally responsible behavior', *Journal of Business Research*, Vol. 61, No. 9, pp.885–893.
- Kollmuss, A. and Agyeman, J. (2002) 'Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior?', *Environmental Education Research*, Vol. 8, No. 3, pp.239–260.
- Lee, K. (2011) 'The role of media exposure, social exposure and biospheric value orientation in the environmental attitude-intention-behavior model in adolescents', *Journal of Environmental Psychology*, Vol. 31, No. 4, pp.301–308.
- Lee, T.H., Jan, F. and Yang, C. (2013) 'Environmentally responsible behaviour of nature-based tourists: a review', *International Journal of Development and Sustainability*, Vol. 2, No. 1, pp.1–15.
- Liobikienė, G. and Juknys, R. (2016) 'The role of values, environmental risk perception, awareness of consequences, and willingness to assume responsibility for environmentally-friendly behaviour: the Lithuanian case', *Journal of Cleaner Production*, Vol. 112, pp.3413–3422.
- Lu, A.C.C., Gursoy, D. and Del Chiappa, G. (2016) 'The influence of materialism on ecotourism attitudes and behaviors', *Journal of Travel Research*, Vol. 55, No. 2, pp.176–189.
- Masud, M.M. and Kari, F.B. (2015) 'Community attitudes towards environmental conservation behaviour: an empirical investigation within MPAs, Malaysia', *Marine Policy*, Vol. 52, pp.138–144.
- Masud, M.M., Aldakhil, A.M., Nassani, A.A. and Azam, M.N. (2017) 'Community-based ecotourism management for sustainable development of marine protected areas in Malaysia', *Ocean & Coastal Management*, Vol. 136, pp.104–112.

- Masud, M.M., Kari, F.B., Yahaya, S.R.B. and Al-Amin, A.Q. (2014) 'Impact of residents' livelihoods on attitudes towards environmental conservation behaviour: an empirical investigation of Tioman Island Marine Park area, Malaysia', *Ocean & Coastal Management*, Vol. 93, pp.7–14.
- Ministry of Natural Resources and Environment (2017) *National Policy on Biological Diversity 2016–2025* [online] <http://www.nre.gov.my/ms-my/PustakaMedia/Penerbitan/National%20Policy%20on%20biological%20Diversity%202016-2025%20Brochure.pdf> (accessed 10 September 2017).
- Monroe, M.C. (2003) 'Two avenues for encouraging conservation behaviors', *Human Ecology Review*, Vol. 10, No. 2, pp.113–125.
- Newman, T.P. and Fernandes, R. (2016) 'A re-assessment of factors associated with environmental concern and behavior using the 2010 General Social Survey', *Environmental Education Research*, Vol. 22, No. 2, pp.153–175.
- Papagiannakis, G. and Lioukas, S. (2012) 'Values, attitudes and perceptions of managers as predictors of corporate environmental responsiveness', *Journal of Environmental Management*, Vol. 100, pp.41–51.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003) 'Common method biases in behavioral research: a critical review of the literature and recommended remedies', *Journal of Applied Psychology*, Vol. 88, No. 5, pp.879–903.
- Polonsky, M.J., Vocino, A., Grimmer, M. and Miles, M.P. (2014) 'The interrelationship between temporal and environmental orientation and pro-environmental consumer behaviour', *International Journal of Consumer Studies*, Vol. 38, No. 6, pp.612–619.
- Puhakka, R. (2011) 'Environmental concern and responsibility among nature tourists in Oulanka PAN Park, Finland', *Scandinavian Journal of Hospitality and Tourism*, Vol. 11, No. 1, pp.76–96.
- Ramdas, M. and Mohamed, B. (2014) 'Impacts of tourism on environmental attributes, environmental literacy and willingness to pay: a conceptual and theoretical review', *Procedia-Social and Behavioral Sciences*, Vol. 144, pp.378–391.
- Sapci, O. and Considine, T. (2014) 'The link between environmental attitudes and energy consumption behavior', *Journal of Behavioral and Experimental Economics*, Vol. 52, pp.29–34.
- Seow, A.N., Choong, Y.O., Moorthy, K. and Chan, L.M. (2017) 'Intention to visit Malaysia for medical tourism using the antecedents of theory of planned behaviour: a predictive model', *International Journal of Tourism Research*, Vol. 19, No. 3, pp.383–393.
- Steward, E.J., Espiner, S., Liggett, D. and Taylor, Z. (2017) 'The forgotten islands: monitoring tourist numbers and managing tourism impacts on New Zealand's subantarctic island', *Resources*, Vol. 6, No 3, pp.1–17.
- Stone, G., James, H.B. and Cameron, M. (1995) 'ECOSCALE: a scale for the measurement of environmentally responsible consumers', *Psychology & Marketing*, Vol. 12, No. 7, pp.595–612.
- Su, L. and Swanson, S.R. (2017) 'The effect of destination social responsibility on tourist environmentally responsible behavior: compared analysis of first-time and repeat tourists', *Tourism Management*, Vol. 60, pp.308–321.
- Suksuwan, S. and Kumaran, S. (2003) *A Proposal for a Management Plan for the Royal Belum, Perak Darul Ridzuan with Some Recommendations*, WWF-Malaysia, Petaling Jaya, Malaysia.
- Takahashi, B. and Selfa, T. (2014) 'Predictors of pro-environmental behaviour in rural American communities', *Environment and Behavior*, Vol. 47, No. 8, pp.856–876.
- Taufique, K., Siwar, C., Chamhuri, N. and Hasan, S. (2016) 'Integrating general environmental knowledge and eco-label knowledge in understanding ecologically conscious consumer behaviour', *Procedia Economic and Finance*, Vol. 37, pp.39–45.

- Wang, C., Zhang, J., Yu, P. and Hu, H. (2018) 'The theory of planned behaviour as a model for understanding tourists' responsible environmental behaviours: the moderating role of environmental interpretations', *Journal of Cleaner Production*, Vol. 194, pp.425–434.
- Wanga, J.O., Hayombe, P.O., Odunga, P.O. and Odede, F.Z. (2013) 'The Nexus between environmental knowledge and ecotourism attitude among the local youths in co-educational secondary schools in Bondo Sub-County, Siaya County, Kenya', *International Journal of Business and Social Research*, Vol. 3, No. 7, pp.103–116.