ORIGINAL ARTICLE

ENCOURAGING PRO-ENVIRONMENTAL BEHAVIOUR: THE FUNCTION OF ENVIRONMENTAL CONNECTEDNESS, ENVIRONMENTAL ETHICS, & ENVIRONMENTAL KNOWLEDGE

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Abstract

The environment is essential in determining the well-being and quality of human life. The rapid development of human civilization causes humans to depend highly on the world of science and technology. Unfortunately, this speed causes people to become complacent in carrying out their responsibility to protect the environment. The effects of these activities have begun to be felt by today's generation. Despite a strong consensus about human environmental responsibility, many people fail to behave in line with their pro-environmental behaviour. This study examines the interrelationship between environmental connectedness, ethics, knowledge, and pro-environmental behaviour. The quantitative survey method and convenience sampling collected data from the Malaysian public. The final valid data of 247 respondents were analysed using descriptive statistics and regression analysis conducted within SPSS. The regression results showed that environmental connectedness, ethics, and knowledge significantly influenced pro-environmental behaviour. These results indicate that citizens who are emotionally attached to the environment, ethically value the environment, and are highly knowledgeable on how to preserve and conserve the environment will help guarantee a comfortable life. Several theoretical and practical implications are also highlighted in this paper.

Keywords: Environmental Connectedness; Environmental Ethics; Environmental Knowledge; Pro-Environmental Behaviour

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Introduction

The environment is one of the essential elements of human life. The environment is closely related to the community's life because all human needs or activities will be in contact with the environment. For example, the human body needs vegetables containing fibre to supply vitamins and substances necessary for the body. Current pollution and environmental damage are becoming significant threats to the world (Henderson & Loreau, 2023)[1]. The rapid pace of modernization in the post-industrial and post-globalization era has made us forget our responsibility to appreciate and preserve the beauty of nature. The main cause of pollution is the irresponsible attitude of an individual or an organization (Fan et al., 2023)[2]. For example, economic activities such as opening new residential and industrial areas are needed, but the ecosystem of an area needs to be preserved. Deforestation without conservation actions, such as replanting trees, has caused flora and fauna to lose their habitat. This causes disasters such as landslides and flash floods.

Human behaviours have been considered one of the critical elements in maintaining and reducing impacts on natural resources (Duong & Pensini, 2023; Esfandiar et al., 2019; Nisbet & Zelenski, 2023; Zhang et al., 2023)[3,4,5,6]. Environmentally friendly behaviours are often associated with protecting the environment and natural settings (Harbrow, 2019)[7]. Empirical research on society's behaviour contended that personal responsibility and protection actions stem from an individual's internalised belief about the impact that their behaviour can have on the environment and are undertaken with the intent to minimise the impact (Landon et al., 2018; Li et al., 2019; Martin et al., 2020)[8,9,10]. Individuals who have pro-environmental behaviour will do something voluntarily to preserve the environment. They are more likely to engage in activities that can make a more significant difference and will do things that have less environmental impact. In general, individuals can be influenced by external and internal factors when choosing their involvement with environmental commitment. External factors include social, cultural, economic, and institutional factors, while internal factors include motivations, environmental knowledge, awareness, and attitudes. Nevertheless, Ertz et al. (2016)[11] posited that individuals might not adopt pro-environmental behavior due to time, cost, and effort. Individuals' behaviour to be connected to the environment also may be influenced by their beliefs, motives, and environmental commitment. Some individuals may be inspired to be involved with environmental behaviour by distinctive factors, including environmental commitment (Han & Hyun, 2017)[12], green lifestyle, or pro-environmental lifestyle (Mohd Suki, 2017)[13], environmental consciousness (Mishal et al., 2017)[14], and goal-framing differences (Chakraborty et al., 2017)[15].

Policymakers are also interested in pro-environmental changes in the context of education because of its implications for environmental preservation and sustainability goals. Studies have looked at how people behave in favour of the environment in a variety of contexts, including waste (Wut et al., 2021)[16], electronic environmental knowledge (Zareie & Navimipour, 2016)[17], gender differences in pro-environmental behaviour (Vicente-Molina et al., 2018)[18], and even the use of message notes to encourage recycling (Georgescu & Herman, 2020)[19]. However, previous studies were conducted in different contexts. Therefore, the study aims to close the gap in the literature on environmental sustainability in Malaysia. This study aimed to answer whether individuals' environmental connectedness, environmental ethics, and environmental knowledge significantly influence people's pro-environmental behaviour.

Literature Review & Hypotheses Development

Environmental Management and Issues in Malaysia

Since the 1980s, Malaysia has been actively involved in environmental advocacy at both national and international levels. For example, the Langkawi Declaration on the Environment, 1989 has made Malaysia the environmental leader in overcoming Environmental problems among Commonwealth countries. In fact, in 2021, the General Assembly confirmed the appointment of Maimunah Mohd Sharif as Executive Director of the United Nations Human Settlements Programme (UN-Habitat). Malaysia has also sent nine youth representatives from Yayasan Anak Warisan Alam (YAWA), 12-14 years old, to the Tunza International Children's Conference on the Environment 2008.

In Malaysia, the problem of environmental pollution is not a new thing and is often discussed from time to time. The increase in waste has contributed to the occurrence of pollution. Undeniably, population growth and speed development, as well as industrial and domestic sectors, have led to growing pollution problems (Ongan et al., 2023)[20]. On 7 March 2019, removing chemical waste in the Kim Kim River led to river pollution and affecting the general public's health. Among the chemicals identified are five compounds, including Ethyl Benzene, Toluene, Xylene, DLimonene, and Benzene, which cause severe water pollution in Sungai Kim Kim, Pasir Gudang, Johor. Moreover, in 2018, there were 63 rivers categorized as polluted. Some rivers are at a dying level, filled with garbage, especially plastic bottles and used tires, and even forming small islands, causing the river water to turn black and emitting a foul smell. Examples of rivers categorized as polluted in Malaysia include Sungai Juru in Penang, Sungai Segget in Johor, and Sungai Klang in Selangor (Sinar Harian, September 23, 2019)[21].

To promote the environment's well-being and sustainable development, the Malaysian government has formed a legal and institutional framework for environmental protection. Several acts to protect the Environment have been enacted. Among them is the Environmental Quality Act. In Malaysia, the Department of Environment (DOE) is responsible for ensuring sustainable

development for the well-being of Malaysians. DOE also plays a role as an educator towards continuously appreciating the natural environment. This includes encouraging the concept of self-compliance by the industry and the public. In Malaysia, environmental management approaches and strategies are constantly modified and improved in line with rapid development.

The National Environmental Policy (NAP) was created to continue economic, social, and cultural progress and improve the quality of life of Malaysians through environmental well-being and sustainable development. The purpose of NAP is to achieve (1) a clean, safe, healthy, and productive environment, (2) to support the conservation of unique and diverse cultural and natural heritage with the effective participation of all sectors, and (3) to promote ways of life, consumption patterns, and sustainable production. There are eight (8) principles under the policy, namely: 1) environmental surveillance, 2) conservation of nature's resilience and diversity, 3) continuous improvement of environmental quality, 4) sustainable use of natural resources, 5) integrated decision making, 6) the role of the private sector, 7) commitment and accountability, and 8) active participation in the international community.

In addition to the government roles, many non-governmental organizations (NGOs) such as Malaysian Nature Society (MNS), EcoKnights, Peka Malaysia, and Sahabat Alam Malaysia, either individually or in collaboration with international bodies such as the United Nations Environment Program (UNEP) have played their roles in protecting the Environment. NGOs often organise awareness advocacies and campaigns. The corporate sector also has played an active role in preserving nature. The corporate sector can invest in beautifying an area as a tourist destination. The Berjaya Group, for example, has collaborated to develop and beautify Redang Island.

Pro-Environmental Behaviour

Conservation and preservation of the environment is significant for every layer of society. The practice of environmental protection needs to be nurtured from childhood and continues until one becomes aware of its importance. Pro-environmental behaviour can be defined as an action taken by an individual who is friendly to the Environment and ensures that the quality of the natural environment will not diminish (Mansoor & Wijaksana, 2023)[22]. It is also defined as environmentally friendly activities and practices involving pollution reduction and using natural environment-friendly materials (Gao et al., 2023)[23]. According to Shanmugavel and Balakrishnan (2023)[24], pro-environmental behaviour combines sustainable and environmentally friendly approaches. The Ministry of Energy, Green Technology and Water (KeTTHA) defines pro-environmental behaviour as an environmentally friendly practice that leads to the formation of individuals who can preserve natural resources for present and future generations.

KeTTHA outlines six criteria for defining pro-environmental behaviour. These include energy saving, water saving, 3R practice using environmentally friendly products, sustainable food consumption, and sustainable transportation. To enhance pro-environmental behaviour, awareness of taking care of the Environment through education is crucial to enhance pro-environmental

behavior development (Farrukh et al., 2023)[25]. There are three essential aspects in practicing green practices: knowledge, attitude, and the practice of green practices. Schools and universities could act as a sustainable platform to implement pro-environmental behaviour practices. Knowledge about environmental issues affects a person's attitude towards the Environment (Gao et al., 2023)[23]. At the same time, attitude also leads to pro-environmental behaviour.

Connectedness to Nature, Environmental Knowledge, Environmental Ethics, and Pro-Environmental Behaviour

Humans live in the natural environment. Humans and the environment should mutually benefit (Duong & Pensini, 2023)[3]. The natural environment provides a place for humans to live and resources that are very useful to meet the needs of life. Humans must cultivate resources and preserve the natural environment for mutual benefit (Nisbet & Zelenski, 2023)[5]. Human activity dramatically affects environmental conditions and sustainability (Zhang et al., 2023)[6]. If humans cultivate and take natural resources unwisely, it can damage the environment. A damaged environment will undoubtedly harm human life—for example, floods, droughts, landslides, and fewer natural resources. Past studies have discovered that the level of environmental awareness in Malaysian society is still low compared with developed countries such as Japan, Denmark, and Germany. Society is generally sensitive to environmental issues. However, awareness of how to overcome the problem is minimal (Soomro et al., 2023)[26].

Nature connectedness is an individual's subjective sense of their relationship with the natural world (Martin & Czellar, 2016)[27]. Previous researchers highlighted that the levels of nature connectedness are positively associated with evaluation and well-being (Li et al., 2019; Mackay & Schmitt, 2019)[3,28]. A growing body of evidence suggests that nature connectedness benefits human well-being and affects pro-environmental behaviour (Duong & Pensini, 2023)[3]. Given the apparent benefits, nature connectedness is emerging as an essential enabler of a sustainable relationship with the natural world (Teixeira et al., 2023)[29]. Environmental connectedness is considered a personality trait, and it can be aroused when the individual is more connected and concerned with nature. Lengiezan et al. (2023)[30] explained that connectedness is a mixture of cognitive, affective, and behavioral components. There are several ways to learn and connect with the environment. One of them is going for a walk outside the city, and it is suggested that participating in activities such as bird watching, plant appreciation, recycling, or learning to take pictures of nature could become a good foundation for environmental connectedness (Bezeljak et al., 2023; Teixeira et al., 2023)[31,29]. To teach young children at home to appreciate and respect nature, outdoor activities must be carried out constantly (Zhang et al., 2023)[6]. For example, it is a trip to the mountains, beach, river, and recreational parks and areas. Making a nursery, for example, is a simple activity that can teach children to experience plant growth. Children can be taught certain habits at home that help care for the environment. Among these habits are turning off the tap water when brushing teeth, turning off the shower when soaping, separating the food waste accordingly, and recycling the oil waste into soaps or candles.

Next, environmental ethics is a new concept for society and began to be considered a sub-branch of moral philosophy. Environmental ethics emphasizes the relationship between humans and the environment, including every act, attitude, and action (Singh et al., 2019)[32]. Environmental ethics has also raised new questions for people to think about the impact of human interests on the environment (Reed & Slaymaker, 1993)[33]. Most philosophers, especially from Asia, generally believe in Animism, which is faith and religion. Most animistic people think that the environment is a part of themselves. Therefore, every human action done to the environment will be reciprocated. From an Islamic perspective, Islamic philosophers think humans must respect nature because it is one of God's creations. Some various approaches or principles have been put forward regarding environmental ethics. According to history, Western philosophers are more inclined to use the belief of Anthropocentrism. Anthropocentrism believes that humans are the most important beings. This explains that everything that exists on the earth is essential for humans (Traer, 2019)[34]. Therefore, environmental ethics is a moral practice for the environment, and this matter is essential to ensure the sustainability of the environment (Rolston III, 2020)[35]. Humans with negative traits can hurt the environment if they remain greedy when exploring nature. On the other hand, humans with the principal biocentrism and ecocentrism have a moral obligation to protect the environment (Verma, 2019)[36]. Coinciding with this principle, all parties need to prioritize the principle of good quality of life. This principle also asserts that priority should be given to preserving a good environment.

According to UNESCO- The United Nations Environment Programme (UNEP), a person who is environmentally literate and knowledgeable is a person who can understand, make reasonable decisions, and act according to the interests of the Environment. Similarly, past studies have discovered that environmental knowledge helps people work individually and collectively to balance the quality of life and the quality of the environment (Bala et al., 2023)[37]. In Malaysia, environmental education in schools or universities should be addressed. The active involvement of the students should focus on activities or exposure outside the classroom to promote awareness and action towards the Environment. Examples are gardening, farming, river monitoring, and learning about plants and forests. These efforts promote a sense of appreciation and responsibility and empower people to change towards a more sustainable lifestyle. This effort will also enable people to think critically and be more environmentally responsible (Asif et al., 2023)[38]. Environmental education should also convey values such as sustainable use, sustainable development, and protection of natural resources. The knowledge that has been acquired could be translated into behaviour. Therefore, environmental knowledge leads to a society concerned with a cleaner, greener, and healthier environment (Chaihanchanchai & Anantachart, 2023)[39]. This study hopes to provide fruitful future research directions in environmental studies. Based on the above discussion, this study proposed the following hypotheses:

H1: Environmental connectedness significantly predicts pro-environmental behaviour.
H2: Environmental ethics significantly predicts pro-environmental behaviour.
H3: Environmental knowledge significantly predicts pro-environmental behaviour.

Figure 1 shows the research model for the three constructs and their theoretical relationships, as discussed above.

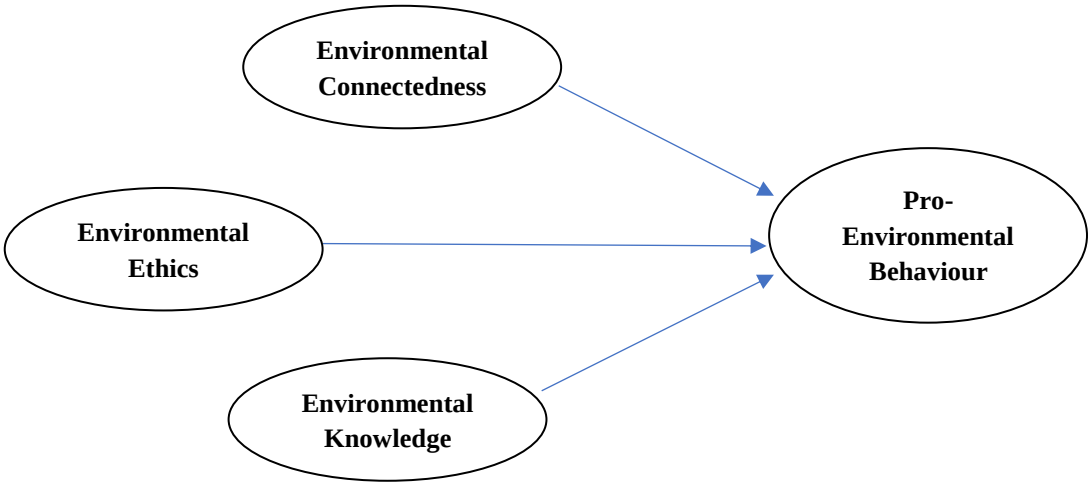

Figure 1. Conceptual model

Methodology

A quantitative research method was chosen for this study. The approach used to collect data is a questionnaire using a convenience sampling technique. This study covers a group of Malaysian citizens. Three hundred respondents were selected for this study. The researchers considered distributing the questionnaire among 500 participants, and this size is assumed adequate as a sample size between 30 and 500 is already acceptable for most research studies (Sekaran & Bougie, 2019)[40]. The ten-item questionnaire survey to measure environmental connectedness was adapted from the study of Pearce et al. (2022)[41]. Environmental ethics was measured using four items adapted from Gurbuzoglu Yalmanci (2015)[42]. Environmental knowledge was measured using four items adapted from Jaiswal and Kant (2018)[43]. Then, pro-environmental behaviour was measured by seven items adapted from Blok et al. (2015)[44].

The data analysis technique used in this research includes (1) testing preliminary requirements, (2) testing the significant differences, and (3) regression analysis. A reliability test is performed first to show whether an instrument used can be trusted as a data collection tool. The Cronbach alpha value > 0.80 is acceptable and reliable (Gliner & Morgan, 2000)[45]. The normality test was then performed to ensure the data collected was distributed normally. One of the popular methods for testing normal distribution is to determine skewness and kurtosis. Kline (2005)[46] suggests a kurtosis value of ± 1 is excellent for most psychometric uses, but ± 2 is usually sufficient. This study uses a deviation value of ± 2. Kline (2005)[46] suggests the kurtosis range value is ± 10 for normal data.

Results

Demographic Profile

The researchers attempted to achieve valid data and distributed the questionnaire among 300 respondents of diversified attributes. We received 262 responses; of them, only 247 were used for analysis due to missing data. Table 1 shows the background information of the respondents. Most respondents are female, with 176 respondents (71.3%) and 71 male respondents (28.7%). Most respondents were 21 - 30 years old (n=137, 55.5%). As for the highest education level, most respondents obtained a diploma-level qualification (n=170, 68.8%).

Table 1
Demographic Profile

No.	Profile	Frequency (n)	Percentage (%)
1	Gender		
	Male	71	28.7
	Female	176	71.3
2	Age Group		
	18 – 20 years old	64	25.9
	21 - 30 years old	137	55.5
	31 - 40 years old	34	13.8
	41 – 50 years old	10	4.0
	51 – 60 years old	2	0.8
3	Highest Education Level		
	Secondary level (SPM)	0	0.0
	Diploma level	170	68.8
	Bachelor degree level	67	27.1
	Master degree level	5	2.0
	Ph.D. or DBA level	5	2.0

Reliability & Normality Analyses

Based on Table 2, the reliability results show that the Cronbach alpha values for environmental connectedness (0.840), environmental knowledge (0.806), and pro-environmental behaviour (0.830) were above 0.80. These indicate that the variable instruments were reliable. The normality results found that all Skewness (≤±2) and Kurtosis (≤±10) values for the variables were in a normal distribution (see Table 2).

Table 2
Normality & Reliability Results

Variable	Mean	SD	Skewness	Kurtosis	Cronbach's Alpha	No. of Items
Environmental Connectedness	4.127	0.667	-1.554	2.987	0.840	10
Environmental Ethics	4.089	0.427	-0.976	1.564	0.810	4
Environmental Knowledge	4.017	0.711	-1.779	1.980	0.806	4
Pro-Environmental Behaviour	4.140	0.753	-1.583	3.114	0.830	7

Harman Single Factor Test

Producing valid and reliable research findings is the responsibility of every researcher. Research findings should significantly contribute to the knowledge group from a theoretical, practical, and empirical perspective. Common Method Variance (CMV) is causing a problem of internal consistency. CMV usually occurs due to the self-reported questionnaire. This study conducted Harman's single-factor test using exploratory factor analysis to assess the CMV. The outcome of the principal component analysis revealed that the first factor did not explain more than 50% of the variance; it only explained 34.57% of the variance (Podsakoff et al., 2003)[47].

Correlation Analysis

Table 3
Pearson Correlation Results

		Pro-Environmental Behaviour
Environmental Connectedness	Pearson Correlation	0.457**
	Sig. (1-tailed)	0.000
	N	247
Environmental Ethics	Pearson Correlation	0.513**
	Sig. (1-tailed)	0.000
	N	247
Environmental Knowledge	Pearson Correlation	0.620**
	Sig. (1-tailed)	0.000
	N	247

Based on Table 3, there are significant and positive relationships between Environmental Connectedness (r=0.457, p<0.05), Environmental Ethics (r=0.513, p<0.05), and Environmental Knowledge (r=0.620, p<0.05) towards Pro-Environmental Behaviour. Thus, H1, H2, and H3 were accepted.

Regression Analysis

Table 4
Regression Results

Variables	Beta *(β)*	Sig. *(p)*	Tolerance	VIF
Environmental Connectedness	0.406	0.000	0.839	1.222
Environmental Ethics	0.206	0.000	0.800	1.472
Environmental Knowledge	0.326	0.000	0.805	1.206
R^2	0.602			
Adjusted R^2	0.491			
F Change	37.214			
Sig.	0.000			

Regression analysis was used to determine the strongest predictor of pro-environmental behaviour. First, to detect the existence of multicollinearity, this study refers to the value of the Variance Inflation Factor (VIF) and tolerance. If the VIF is less than ten and the tolerance value is more than 0.20, then the model has no multicollinearity. Using tolerance and the VIF factor, it was revealed that there was no presence of multicollinearity (see Table 4). The absence of multicollinearity estimates the regression coefficients more accurately than their parameters. The R^2 value of 0.602 means that it can explain 60.2% of Pro-Environmental Behaviour. At the same time, the remaining can be explained by other factors not examined in this research. The result also shows a high beta value which depicts that Environmental Connectedness (β=0.406, p=0.000), Environmental Ethics (β=0.206, p=0.000), and Environmental Knowledge (β=0.326, p=0.000) explain a high degree of Pro-Environmental Behaviour.

Discussion

The main objective of this study is to examine the interrelationship between environmental connectedness, environmental ethics, environmental knowledge, and pro-environmental behaviour. The correlation and regression results showed that environmental connectedness,

ethics, and knowledge explain a high degree of pro-environmental behaviour. The role of environmental connectedness, ethics, and knowledge has received increasing attention from previous empirical studies (e.g., Al Zaidi et al., 2023)[48]. Pro-environmental behaviors involve a behavior change related to the internal and external environment, such as value, cognition, knowledge, personality, self-efficacy, and others.

The government could encourage pro-environmental behaviour through legislation and policies (Silvi & Padilla, 2021)[49]. For instance, they are introducing more relevant schemes or incentives to promote pro-environmental behaviour, such as recycling oil waste and e-waste. In Japan, neighbours are responsible for sorting, treating, and segregating their household waste, governed under a strict and scheduled collection calendar. Next, in Switzerland, garbage bags are sold at a higher price, while recycling is free of charge. Then, both public and private organisations also should promote more corporate social responsibility (CSR) and sponsorship of social activities that improve social and environmental well-being. For example, in Maybank, the employees are given a paid leave of up to one month to encourage their staff to join the CSR program.

Applying pure values is crucial in increasing public awareness of the environment and pro-environmental behaviour (Dehghani Soltani et al., 2019)[50]. Learning and teaching strategies must be nurtured through a spiritual and moral approach by considering that God is the creator of all living things, including humans, plants, and other creatures. Education and awareness of the preservation and conservation of the environment require knowledge, understanding, attitude changes, and community participation (Ardoin et al., 2020)[51]. This matter needs to be nurtured as early as possible because it will be a determining factor in the practice of pro-environmental behavior. An effective way to foster environmental value is through educational institutions, especially schools and universities. Sekolah Lestari is an example of best practice for environmental education in which it applies the virtues of the environment in aspects of management, curriculum, and co-curriculum that align with sustainable development.

According to Islam, humans are not in absolute power and are responsible for all their actions because life does not end in the world. As God's creatures, humans can benefit from nature at the appropriate rate without causing damage to nature (Islam et al., 2022)[52]. Human beings have been chosen as caliphs or guardians of the earth. It is not appropriate for humans to betray the demands and orders of God by doing damage to nature. Environmental values can be implemented through informal environmental education (Ardoin et al., 2020)[51]. For example, parents can play their role by explaining and showing actions of appreciating the environment. Parents need to apply these environmental values to their children from an early age so that they can be formed into routines or habits.

This paper contributes by providing policymakers and practitioners with valuable recommendations to help in improving pro-environmental behaviour. Various parties, including the government, private sector, learning institutions, and non-governmental organizations, must

play a role in improving environmental knowledge and awareness among Malaysian. Early education is an initial stage for shaping individual behaviour. Educators are essential in guiding and encouraging the younger generation to practice a sustainable way of life. For example, the university could collaborate with the private sector in executing programs such as beach cleaning, urban farming, or pitching competitions. The government also needs to step up more campaigns to educate the public on the importance of environmental sustainability through various channels such as news, social media, television, radio, and exhibitions. Findings from this study have meaningful theoretical implications as they shed some light on the importance of environmental connectedness, ethics, and knowledge in driving people, particularly in Malaysia, towards pro-environmental behaviour.

Conclusion

The study highlighted the role of environmental connectedness, environmental ethics, and environmental knowledge in promoting pro-environmental behaviour. This study proposes several new insights for the current literature based on the empirical findings. However, the study has some limitations. Firstly, it only focuses on three constructs to predict pro-environmental behaviour. Future studies might want to determine other constructs that may determine pro-environmental behaviour. For example, culture and norm, institutional support, regulative structure, etc. Secondly, this study focuses only on Peninsular Malaysia. Some past studies suggest that geographical factors play an essential role in determining the level of environmental practice. Therefore, replicating this study at a different geographical location may result in new findings in different contexts.

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