

## Exploring The Factors That Influence Island Environment Sustainability

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To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v14-i2/20674>

DOI:10.6007/IJARBSS/v14-i2/20674

**Published Date:** 20 February 2024

### Abstract

In this era of globalization, the issue of environmental sustainability is no longer taken seriously in our daily lives. Therefore, the world's environmental situation is now very worrying. If this matter is not taken seriously, there will be various threats to human beings in the future. The thing that is at the root of this issue is the human attitude. The Theory of Planned Behavior (TPB) compares the new conceptual framework to ensure the structure arrangement matches correctly. We should detect the problems and factors that lead to the island's environmental sustainability. Hence, this paper is conducted to determine the factors that further affect the island's environmental sustainability. In this study, the researcher focuses on the small island area in Malaysia. This study conducted a qualitative research method by interviewing the respondents via online assessment. Ten (10) respondents were selected for the research. The study will analyze the factors and, at the end of the study, will contribute to the innovation of the island sustainability model to ensure we can overcome these global environmental issues.

**Keywords:** Environmental Sustainability, Island Tourist, Island Community, Small Island, Malaysia.

### Introduction

The tourism sector is a rapidly growing sector in the world. The tourism sector also contributes significantly to the growth of the national economy since the government pays more attention to the tourism industry as it has the potential to advance the national economy (Kuo et al., 2021; Ahmad et al., 2011). Since Malaysia has unique features in the tourism sector, many tourists choose this country as a destination, whether from abroad or domestically. These can be proven by Figure 1, which indicates the total number of tourist arrivals in Malaysia.

YEAR	ARRIVALS	RECEIPTS (RM)
2021	0.13 million	0.24 Billion
2020	4.33 million	12.7 Billion
2019	26.10 million	86.1 Billion
2018	25.83 million	84.1 Billion
2017	25.95 million	82.1 Billion
2016	26.76 million	82.1 Billion
2015	25.72 million	69.1 Billion
2014	27.44 million	72.0 Billion
2013	25.72 million	65.4 Billion
2012	25.03 million	60.6 Billion
2011	24.71 million	58.3 Billion
2010	24.58 million	56.5 Billion
2009	23.65 million	53.4 Billion
2008	22.05 million	49.6 Billion
2007	20.97 million	53.4 Billion

Figure 1: Numbers of Tourist Arrivals in Malaysia

Source: Malaysia Tourism Data, 2023

Among the privileges owned, Malaysia is a famous country with a tremendous tropical environment, historical events, historical places, diverse food, beautiful beaches and islands, various ethnicities and cultures, and comfortable accommodations. Nevertheless, even though Malaysia is a popular tourist destination in Asia, it also suffers from environmental problems. This includes water pollution, air and land pollution from industry and waste disposal, climate change, global warming, deforestation, and haze from forest fires (Abd Rahman et al., 2021; Mayan, 2017).

Next, the use of plastic also affects the sustainability of the environment. This becomes more serious when only 44% of Malaysians are aware of the Malaysian Action Plan Towards Zero Use of Single-use Plastic 2018-2030 (Kasnon, 2021). The drastic increase in plastic-based ocean pollution since the 1940s is now a pressing issue. Notably, millions of plastics are used by humans, thrown into landfills, or washed into the sea daily. In Malaysia, about ten years ago, the Ministry of Urban Wellbeing, Housing, and Local Government estimated the amount of solid waste to increase to 30,000 tons per day in 2020. However, the amount has exceeded expectations (Department of Statistics Malaysia, 2021; Ismail, 2018). Pollution on land can be seen clearly and is easier to manage, but pollution in the sea, on the other hand, is challenging to assess and manage. Furthermore, the adverse effects of sea pollution are increasing worldwide but cannot be seen with the naked eye.

All types of pollution, including land, sea, and air, will impact global warming and climate change. Guerra et al (2020) stated that climate change is a worldwide problem. Malaysia is also one of the countries that are affected by climate change. Due to this, it has begun to affect daily life with various dangers. One of the solutions to this problem is through

educational activities to increase knowledge of environmental sustainability. This is very effective, considering Malaysia has a higher proportion of young people than other Southeast Asian countries. Therefore, it is necessary to start educational activities from a young age (Jusoh et al., 2018). With the educational activities provided to the youth, solutions can be produced by increasing their awareness and forming the right attitude and lifestyle (Hamaamin et al., 2019). This is due to the fact that the low level of environmental awareness is also one factor contributing to the issue of environmental sustainability not being well managed (Kasnon, 2021).

Furthermore, community participation in environmental problems results from the community's awareness and concern for environmental issues caused by human activities (Abd Rahman et al., 2021; Abdul Rahman, 2009; Fanning, 1975). Hence, environmental knowledge is fundamental to ensuring community well-being and quality of life can be well maintained. Moreover, environmental knowledge can inspire the community to practice a harmonious living culture and correctly care for the environment (Md Nor. et al. 2017). It is evident here that community knowledge, community awareness, and community participation are among the factors that contribute to environmental sustainability. In addition, environmental cost management is also one of the factors of environmental sustainability since the island's goods are usually more expensive than those on land (Alpiani, 2019). Suppose we observe the price of environmentally friendly goods on the island, even on the ground. In that case, it suggests a price difference where the cost of environmentally friendly goods is more expensive than those not.

When viewed more deeply, several additional factors contribute to environmental sustainability. Among them is the enforcement of environmental sustainability laws (Britannica, 2023; Kheng-Lian et al., 2016; Mycoo et al., 2006), environmental sustainability facilities (Hashim et al., 2021); interest in environmental sustainability (Eugenio et al., 2022), time management for environmental sustainability (Southerton, 2020; Lingard et al., 2017; Rappleye et al., 2016), project planning for environmental sustainability (Strazdins et al., 2011; Osland et al., 2008; Hargreaves, 2008; Dyck, 1990), natural disasters, government guidelines for environmental sustainability (Aikens et al., 2021; Michelsen et al., 2017), and the use of chemical products (Norddahl B., 2021). The human attitude is the main factor that mediates environmental and environmental sustainability factors (Ramadhani et al., 2020; Widayanti et al., 2018; Arifiani et al., 2018).

In conclusion, the researchers of this study will research the factors that affect environmental sustainability, which were gathered from interview sessions. The islands selected in this study were Redang Island and Perhentian Island in Terengganu, Pulau Tioman in Pahang, and Pulau Tinggi in Johor. Exploring the factors influencing island environment sustainability is important in our current global context. Islands represent unique ecosystems with distinct vulnerabilities and dependencies, often facing disproportionate environmental challenges compared to mainland regions. Understanding these factors is crucial for several reasons. For example, islands are often highly susceptible to the impacts of climate change, such as rising sea levels, extreme weather events, and loss of biodiversity. Besides, many islands rely heavily on natural resources for economic development, making sustainability essential for long-term prosperity. In addition, the interconnectedness of global systems means that actions taken on islands can have far-reaching consequences for the broader environment. Studying the

factors influencing island environment sustainability can develop targeted interventions, policies, and strategies to mitigate environmental degradation, promote resilience, and safeguard the well-being of both island communities and the planet.

## **Literature Review**

### **Environmental Sustainability**

According to Edwards (2018), the environment is a complex of physical, chemical, and biotic factors (such as climate, soil, and living things) that act on organisms or ecological communities and ultimately determine their form and survival. We can define sociology as a change in social, biotic, and cultural conditions that affect an individual's or society's life (Safal et al. Upreti, 2011). Imam Ja'far as-Sadiq (a.s.) has mentioned that we must not pollute our environment. Otherwise, it is impossible to live on this planet. He certainly expected the current state of affairs when he made that statement. However, pollution was not a problem in his day. No factory existed, and metal was melted in small furnaces by burning wood. This is not a theory but an irrefutable scientific fact. Therefore, it is estimated that if air pollution increases at the current rate for more than 50 years, 50% of plankton will die, and the amount of oxygen in the air will decrease by the same proportion (Ahlul et al., 2022).

Elements of environmental sustainability are combined with the green building concept, which emphasizes the use of green materials, design, and building systems. The United States Environmental Protection Agency (2009) defined green buildings as environmentally friendly and resource-efficient. This also includes the processes throughout the life cycle of a building, from specification documents to design, construction, operation, maintenance, and repair and demolition. This becomes a requirement for successful projects to design buildings that emphasize economy, utility, durability, and comfort. Notably, value management is a solid foundation for applying environmental sustainability to maintain building projects, especially in the initial phase. Kangas et al. (2018) studied using tree stumps as a relatively new source of forest bioenergy. At the same time, Alba-Hidalgo et al. (2018) defined university environmental sustainability assessment based on different assessment approaches discovered in an integrative meta-analysis of subject-specific literature and a review of assessment tools.

According to Komatsu et al. (2019), individualistic societies are societies in which most members believe they are independent and not dependent on themselves. This will exhibit higher environmental impacts than less individualistic societies, and it is defined as the prevailing belief that interdependence owns' self. Pickering et al. (2020) reviewed theoretical and empirical scholarship on the democracy-environment relationship. Therefore, a systematic review was conducted to identify and analyze environmental knowledge, awareness, attitudes, and practice studies on solid waste management in developing countries from 2010 to 2019 (Debrah et al., 2021). The rich country of Japan ignored the advice of Imam Ja'far as-Sadiq (a.s.), polluted its environment, and accepted the consequences. A new and dangerous disease called Eta Eta has recently appeared in Japan. The cause of the disease is the accumulation of mercury in the body through contaminated water and food. From the time of Hippocrates, the famous Greek physician, until today, about 40,000 diseases have been diagnosed, their symptoms recorded, and treatments prescribed. However, the diseases that have appeared in Japan due to their environmental pollution are still unknown to medical science (Ahlul Bayt Digital Islamic Library Project, 1995-2022).

## Research Methodology

### Case Study Design

This study utilized a qualitative method to analyze individual perceptions of environmental sustainability by island communities and tourists. We collected altogether ten respondents for this study. Three of them are from government agencies, another three respondents are from tourist agencies, two are from island communities, and two are from island tourists. A set of well-prepared questionnaires is distributed thoroughly to the respondents face to face and collected just after they finished answering to avoid missing questionnaire cases. If any doubts of respondents are raised, we manage to clear them wisely to prevent misunderstanding answers and ensure everyone can respond fully and adequately.

### Respondents profile

There are ten respondents altogether. Four were located in Kuala Terengganu, and another six of them located in Penang, Pulau Redang, Pulau Perhentian, Selangor, and Perak, respectively, agreed to be interviewed, as in Table 1.

Table 1

*The details of the respondents*

Respondents	Profile Background	Location
Government Agency 1	Marine Park Department	Kuala Terengganu
Government Agency 2	Environmental Department	Kuala Terengganu
Government Agency 3	Tourism Department	Kuala Terengganu
Tourism Agency 1	Hotel Management	Redang Island
Tourism Agency 2	Hotel Management	Redang Island
Tourism Agency 3	Tourism Management	Penang
Island Community 1	Individual	Redang Island
Island Community 2	Individual	Perhentian Island
Island Tourist 1	Individual	Selangor
Island Tourist 2	Individual	Perak

### Data Collection Process

This study observed and interviewed ten respondents that have faced the COVID-19 pandemic and required necessary changes toward island environmental sustainability. The data was collected in March 2022 through online interviews. Furthermore, semi-structured questions were utilized to interview the respondents on their experiences with island environmental sustainability. This strategy allows the researcher to investigate the details of the environmental sustainability faced by the island community and island tourists during and after the COVID-19 pandemic and how these changed their environmentally friendly lifestyle. Moreover, the data collection process from this study was used to facilitate the recording and documentation of the results. This study describes island communities' and island tourists' attitudes towards island environmental sustainability before, during, and after the COVID-19 pandemic and how it will change their environmental sustainability model. Note that case analysis is essential to represent and understand the topic in detail (Creswell & Poth, 2016).

### Data Coding and Interpretation Finding

This study employed an interpretive approach from interviews and observations to analyze the data. According to Creswell and Poth (2016), the case study requires multiple data

sources. to determine the evidence at each phase of the case's evolution. Hence, this study focuses on answering the research objectives.

Similar data has been grouped into code and analyzed to determine how the event occurred according to the setting. Next, the coding schemes are compared with the literature review to help further understand the process. The meta-analysis method was then used to ensure that the data collected matched the interview results.

### **Results and Discussion**

The data collected in this study are collected through interviews. The respondents are selected based on the four criteria which are:

1. They are involved directly and indirectly in the island's environmental sustainability process.
2. They are aware of the island's environmental sustainability.
3. They have experience in conducting or participating in island environment sustainability.
4. They were involved in the era of the COVID-19 pandemic and had a good comparison before and after the situation on the island's environmental sustainability.

Based on the conducted interviews, the research findings are as follows

Government Agency 1 said, "Attitude is the main reason that affects the island's environmental sustainability."

Government Agency 2 said, "Besides attitude, the additional cost and rules and regulations on island environment is another factor that affects island environmental sustainability."

Government Agency 3 said, "Island development planning must be accounted thoroughly to maintain the island's environmental sustainability."

Tourism Agency 1 said, "Attitude can be formed by raising the knowledge of island environmental sustainability."

Tourism Agency 2 said, "Attitude is one of the reasons that directly affect the island's environmental sustainability."

Tourism Agency 3 said, "Facility of dumping system also affects the island's environmental sustainability."

Island Community 1 said, "Awareness about island environmental sustainability must be applied to protect the island's environmental sustainability."

Island Community 2 said, "Knowledge of dumping system and island environment plays the main role in maintaining environmental sustainability."

Island Tourist 1 said, "The lack of a dumping facility affects the island's environmental sustainability."

Island Tourist 2 said, "Government policy on island environmental sustainability must be strong to maintain the island environmental sustainability."

The interviews revealed a widespread recognition among participants of the urgent need to address environmental sustainability issues. Additionally, the researcher obtained valuable information since the interview involved various aspects: government, businesses, and individuals implementing sustainable practices and the potential for technological innovations to drive positive environmental change, as summarized and listed in Table 2.

Table 2

*Island environmental sustainability answers by respondents (Author, 2023)*

Variable	Factors that Affect Island Environmental Sustainability
Respondents	
Government Agency 1	<ul style="list-style-type: none"> <li>● Attitude</li> <li>● Additional cost</li> <li>● Rules and regulation</li> <li>● The facility of the dumping system</li> <li>● Usage of chemical product</li> </ul>
Government Agency 2	<ul style="list-style-type: none"> <li>● Attitude</li> <li>● Cost of environmental maintenance</li> <li>● Cost of environmental project</li> <li>● Rules and regulation</li> </ul>
Government Agency 3	<ul style="list-style-type: none"> <li>● Rules and regulation</li> <li>● Attitude</li> <li>● Project planning</li> <li>● Participation</li> <li>● Awareness</li> </ul>
Tourism Agency 1	<ul style="list-style-type: none"> <li>● Attitude</li> <li>● Interest</li> <li>● Participation</li> <li>● Knowledge</li> </ul>
Tourism Agency 2	<ul style="list-style-type: none"> <li>● Attitude</li> <li>● Time management</li> <li>● Knowledge</li> <li>● Awareness</li> </ul>
Tourism Agency 3	<ul style="list-style-type: none"> <li>● Knowledge</li> <li>● Rules and regulation</li> <li>● Awareness</li> <li>● Facility</li> <li>● Attitude</li> </ul>
Island Community 1	<ul style="list-style-type: none"> <li>● Knowledge</li> <li>● Awareness</li> <li>● Rules and regulation</li> <li>● Environment disaster</li> </ul>
Island Community 2	<ul style="list-style-type: none"> <li>● Awareness</li> <li>● The facility of the dumping system</li> <li>● Knowledge</li> <li>● Rules and regulation</li> </ul>
Island Tourist 1	<ul style="list-style-type: none"> <li>● Awareness</li> <li>● Facility</li> <li>● Knowledge</li> <li>● Attitude</li> </ul>

Island Tourist 2	<ul style="list-style-type: none"> <li>• Knowledge</li> <li>• Awareness</li> <li>• Rules and regulation</li> <li>• Government policy</li> </ul>
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Based on the previous study conducted on the Theory of Planned Behavior (TPB) model (Akintunde, 2017), as in Figure 2, attitude is a mediator between factors and environmentally responsible behavior. This study also structured the respondents' answers and developed one perfect conceptual framework that suits the model of island environmental sustainability.

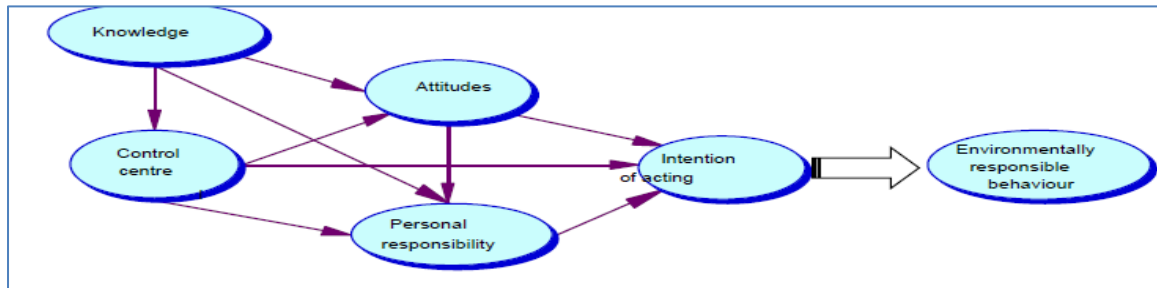


Figure 2: Theory of Planned Behavior (TBP)

Source : Akintunde (2017)

The environmental sustainability factors classified as independent variables are knowledge, participation, awareness, rules and regulations, facility, additional cost, interest, time management, project planning, environmental disaster, government policy, and usage of chemical products. Meanwhile, attitude is the mediator, while environmental sustainability is the dependent variable—the conceptual framework is illustrated in Figure 3 below.



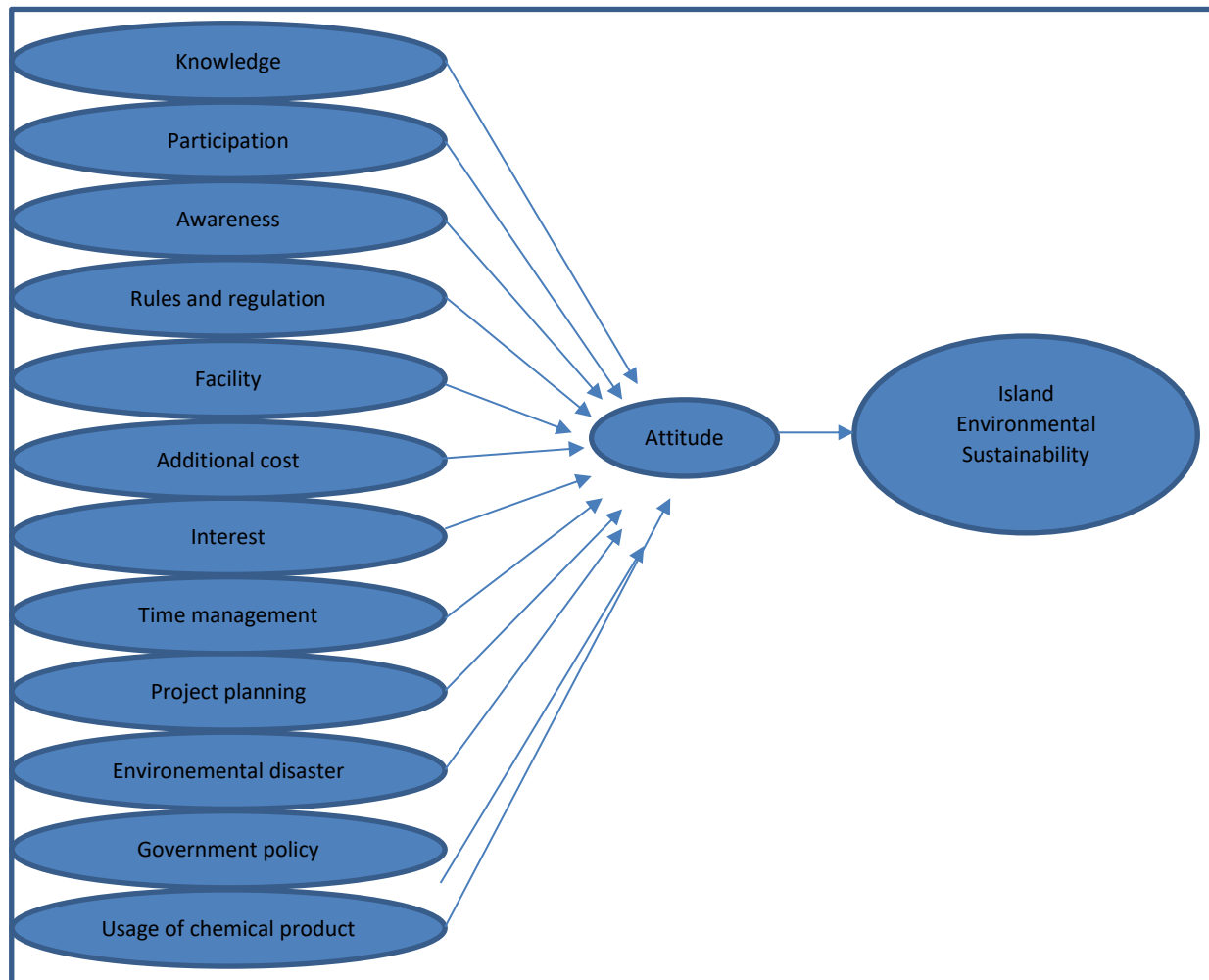


Figure 3: Proposed conceptual framework (Designed by author, 2023)

### Conclusion

Island environmental sustainability has been affected during the COVID-19 pandemic. Many things happened in between the movement of a control order. First, the physical motion of humans has been slowed down. Second, the business activities were controlled by hours, and the purchasing limitation had been applied. Third, recreational activity also decreased due to the spread of the COVID-19 virus. All of the mentioned things affect the island's environmental sustainability.

COVID-19 was the point of measure that some differences happened in the island's environmental sustainability before, during, and after the pandemic. However, the factor should be identified to create the model that suits the user and is applicable to apply timely updates. There will also be many factors that affect the island's environmental sustainability. Hence, this study focuses on the factors and suggests that most respondents comment on the factors that affect the island environment sustainability: attitude, knowledge, awareness, rules and regulations, facility, additional cost, and participation. The least answered by the respondents were using chemicals, time management, interest, environmental disaster, government policy, and project planning.

The study of factors influencing island environment sustainability holds significant importance and benefits for multiple stakeholders. Primarily, policymakers and environmental agencies stand to gain invaluable insights to formulate effective strategies and policies to mitigate environmental degradation and foster resilience in island ecosystems. Understanding these factors is essential for island communities to safeguard their livelihoods, culture, and well-being amidst the challenges posed by climate change and resource exploitation. Additionally, businesses and industries operating in island regions can benefit from a clearer understanding of sustainability dynamics, enabling them to adopt practices that align with environmental stewardship while maintaining economic viability. Furthermore, the broader scientific community gains valuable knowledge about the intricate interplay between natural systems and human activities in island environments, contributing to global efforts towards sustainable development and conservation. Studying factors influencing island environment sustainability holds far-reaching implications, offering critical insights and opportunities for positive change across multiple sectors and stakeholders.

The model of TPB suits the most to be adopted, and some changes to build up the latest model to be applied to maintain the island's environmental sustainability. The factors leading to the island's environmental sustainability should be analyzed with the island community and tourists to observe the significance level. Therefore, future studies should encourage more on the applications of technology to maintain the island's environmental sustainability. Due to the future generation's spending more time with gadgets, the researcher should conduct more research and develop ways to implement the model through the devices. For instance, the model of island environmental sustainability can be shared through social media such as Facebook, Twitter, and Instagram to increase the awareness, knowledge, and attitude of island communities and island tourists. Moreover, research on technologies on the latest eco-friendly machinery on island environmental sustainability should also be conducted to decrease pollution and increase the goodness of the environment. For example, using electric vehicles to clean the island will reduce air pollution due to less carbon emission. Thus, conducting more research and development on the island is essential to maintain its environmental sustainability.

### **Acknowledgment**

This research was funded by the Ministry of Higher Education for Fundamental Research Grant Scheme (FRGS/1/2021/WAB01/UNISZA/03/2 (RR413)).

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