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### A Structured Review: Environmental Sustainability in Malaysia

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#### ABSTRACT

As global concerns regarding environmental sustainability intensify, Malaysia, an emerging economy in Southeast Asia, stands at a critical juncture in its pursuit of sustainable development. This structured review offers a comprehensive analysis of environmental sustainability efforts within Malaysia, an emerging economy in Southeast Asia. Through a systematic examination of relevant literature, the paper explores the historical trajectory, current challenges, and future prospects of environmental initiatives in the country. It critically assesses policy frameworks, regulatory mechanisms, socio-economic impacts, and technological interventions, providing insights into their effectiveness and areas for improvement. The study also investigates the pivotal roles played by various stakeholders, including government agencies, non-governmental organizations, and the private sector. This systematic review adheres to the PRISMA technique, ensuring a rigorous and transparent approach to data synthesis. A comprehensive search was conducted across reputable databases, including SCOPUS and EconBiz, employing advanced search strategies to identify pertinent studies on community readiness toward digitalization. A comprehensive examination (n=29) of pertinent studies reveals four prominent themes in Environmental Sustainability in Malaysia. These themes encompass the domains of Sustainable tourism development and policy (9), Environmental sustainability and conservation (7), Tourist behaviour and satisfaction (4), and Education and perception (9). By synthesizing empirical evidence and theoretical frameworks, this paper provides valuable insights for academics, policymakers, and practitioners, advocating for integrated approaches that balance economic growth with ecological preservation in Malaysia's pursuit of a sustainable future.

#### Keywords:

Environment; Sustainability;  
Environmental sustainability; Tourism;  
Malaysia

### 1. Introduction

Environmental sustainability is a critical issue that has gained growing attention over the past few years as a result of the effects of human activities on the environment [1-5]. Malaysia is a country

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that has been actively promoting environmental sustainability through various initiatives and policies [6]. Spanning a diverse spectrum of disciplines, the corpus of research on environmental sustainability in Malaysia encompasses critical areas such as ecotourism development, stakeholder engagement, policy formulation, and the management of protected areas [7-11]. By distilling the collective wisdom from a plethora of studies, this review seeks to distil the essence of sustainable practices, emerging challenges, and innovative strategies that have emerged within the Malaysian context. The aim is to delineate the nuanced dynamics that underlie the endeavour to balance economic prosperity with the preservation of natural heritage.

Therefore, conducting a structured review of the existing literature on environmental sustainability in Malaysia is essential to understand the present status of this area's research. This review aims to provide a comprehensive analysis of the existing literature on environmental sustainability in Malaysia, focusing on identifying the current trends, issues, as well as difficulties associated with environmental sustainability in the country. The review will examine the policies, initiatives, and strategies the Malaysian government implements to promote environmental sustainability. It will also identify the challenges and barriers faced by the government and other stakeholders in promoting environmental sustainability in Malaysia.

The review will provide valuable insights into the current state of research on environmental sustainability in Malaysia and identify areas for future research. The results of this review will be beneficial to scholars, policymakers, as well as other stakeholders interested in promoting environmental sustainability in Malaysia. The review will comprehensively search relevant literature from various databases, including Scopus and Econbiz. The search will be limited to studies published in the 3 years to ensure that the review reflects the current state of research on environmental sustainability in Malaysia. The review will also use a quality assessment tool to assess the studies' quality.

## **2. Literature Review**

Tourism is a significant contributor to Malaysia's economy, and environmental sustainability is a critical issue in the tourism industry. Here, a systematic literature review can provide valuable insights into the current state of research on this topic. Several recent studies have conducted systematic literature reviews on related topics, such as sustainable tourism, ecotourism, and tourism and climate change [12-16]. These studies have identified key contributions, barriers, innovations, and future possibilities in their respective focus areas [17].

One study on sustainable tourism found that the concept of sustainability is still evolving in the tourism industry [18], and there is a need for more research on the implementation of sustainable practices [19-21]. Another study on sustainable tourism in Malaysia identified several challenges, including the lack of awareness and understanding among stakeholders, inadequate government policies and regulations, and insufficient funding and resources [22-25]. A study on ecotourism found that ecotourism can contribute to environmental conservation and community development, but there are also challenges related to the management and marketing of ecotourism products [26-28].

Based on previous research, there are still several challenges that must be taken into consideration in order to advance sustainable tourism. Among these difficulties are the exploitation of natural resources [29], lack of awareness and understanding among stakeholders in Malaysia [30], economic pressures [31], cultural preservation [32], and infrastructure development [33]. Overall, these challenges must be addressed to ensure that sustainable tourism practices can continue promoting environmental sustainability in Malaysia. By promoting education and awareness-raising campaigns, prioritizing environmental protection and community development, respecting local

cultures and traditions, and reducing the environmental impact of transportation, sustainable tourism can help preserve Malaysia's natural and cultural heritage for future generations. Figure 1 demonstrates how activities that lead to the loss of mangroves in Malaysia give local populations a variety of goods that may be used as a means of revenue, including seafood products, poles, charcoal firewood, timber products, pilings, as well as numerous others.

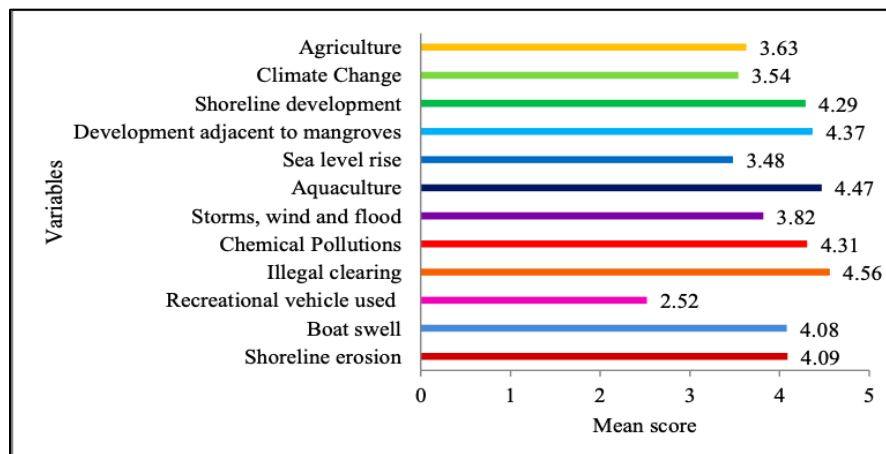


Fig. 1. Activities that contribute to the loss of mangroves in Malaysia [30]

### 3. Material and Methods

#### 3.1 Identification

In order to create a report, the systematic review process involves three main phases. The first step is to recognize keywords and search for linked, similar terms based on thesauri, dictionaries, encyclopaedias, and previous studies. Once all relevant keywords have been identified, search strings on databases such as Scopus and EconBiz are created, as stated in Table 1. In the first step of the systematic review process, 528 papers were successfully retrieved from both databases.

Table 1

The search string

Scopus	TITLE-ABS-KEY ( environment* AND sustainable* AND tourism AND Malaysia ) AND ( LIMIT-TO ( DOCTYPE, "ar" ) ) AND ( LIMIT-TO ( SRCTYPE, "j" ) ) AND ( LIMIT-TO ( LANGUAGE, "English" ) ) AND ( LIMIT-TO ( PUBSTAGE, "final" ) ) AND ( LIMIT-TO ( PUBYEAR, 2020 ) OR LIMIT-TO ( PUBYEAR, 2021 ) OR LIMIT-TO ( PUBYEAR, 2022 ) OR LIMIT-TO ( PUBYEAR, 2023 ) )
Econbiz	(environment* AND sustainable* AND tourism AND malaysia)

\*Accessed date: 21 September 2023

#### 3.2 Screening

The second step of the systematic review process involved selecting 49 articles based on several inclusion and exclusion criteria developed by researchers. Since literature is the main source of useful information, research articles met the first condition. The present investigation did not include publications published as book series, books, chapters, meta-analyses, meta-syntheses, systematic reviews, or conference proceedings. Furthermore, only English-language papers were included in the review. The schedule was chosen for a four-year duration (2020-2023), and only studies carried out in Malaysia's territory were selected to conform to the analysis objective as in Table 2. In total, 479 publications based on specific parameters were excluded, and duplicated papers were removed during the screening phase, disqualifying two papers in the study's preliminary phase.

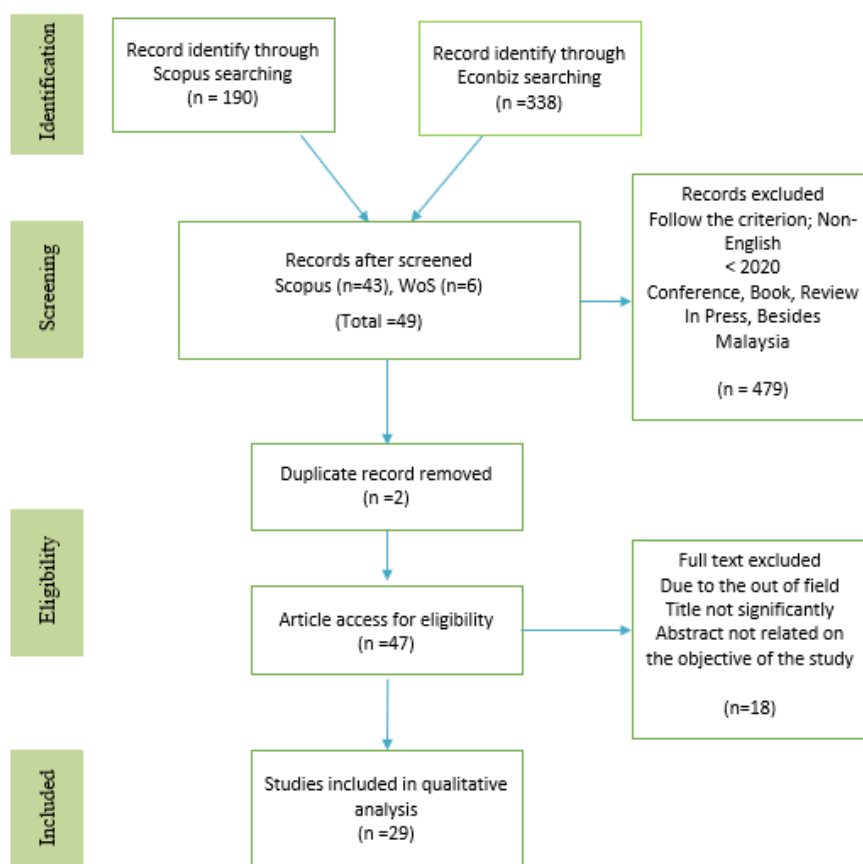
**Table 2**

The selection criterion is searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2020 – 2023	< 2020
Literature type	Journal (Article)	Conference, Book, Review
Publication Stage	Final	In Press
Country	Malaysia	Besides Malaysia

### 3.3 Eligibility

During the third step of the systematic review process, known as eligibility, a total of 47 articles were prepared. A thorough examination of all article titles and essential content was conducted to ensure their alignment with the inclusion criteria and the objectives of the current study. Out of these, 18 were excluded for reasons such as being outside the scope of the study, having titles unrelated to the study's objectives, or lacking relevant abstracts. Finally, 29 articles were available for review, as illustrated in Figure 2.



**Fig. 2.** Flow diagram of the proposed search study [34]

### 3.4 Data Abstraction and Analysis

In this study, an integrative analysis was performed, which involved analysing and synthesizing different research designs, including qualitative, quantitative, and mixed methods. The expert research focused on developing appropriate topics and sub-topics. The first step in the development of the theme was the data collection phase, where the authors carefully reviewed a group of 29 for

statements or information addressing questions from this current research. In the second step, the authors and experts analysed the environmental sustainability in Malaysia and determined and formed meaningful groups. The four main themes from the approach are sustainable tourism development and policy, environmental sustainability and conservation, tourist behaviour and satisfaction, and education and perception. The authors resumed each developed theme from here, including any themes, concepts, or ideas having any relationship. Within the framework of this study, the corresponding author worked with other co-authors to establish themes based on the findings. A log was maintained during the data analysis process to document any analysis, opinions, puzzles, or other ideas relevant to the data interpretation. The authors also compared the findings to resolve discrepancies in the theme-creation process. If any inconsistencies in the themes arose, the authors addressed them with one another. Ultimately, the refined themes underwent adjustments to guarantee their coherence. To validate the issues, two experts conducted examinations. This expert review phase played a crucial role in confirming each sub-theme's clarity, significance, and sufficiency, establishing domain validity. Subsequently, the author incorporated expert feedback and comments, adjusting at their discretion.

#### **4. Result and Findings**

##### *4.1 Theme 1: Sustainable Tourism Development and Policy*

Based on the search technique, 29 articles were extracted and analysed. All articles were categorized based on four main themes: sustainable tourism development and policy, environmental sustainability and conservation, tourist behaviour and satisfaction, and education and perception (Table 3).

**Table 3**

The research article's findings are based on the proposed search criterion

Authors	Title	Source Title	Methodology	Results & Findings
Rahman M.K.; Masud M.M.; Akhtar R.; Hossain M.M. [7]  2022	Impact of community participation on sustainable development of marine protected areas: Assessment of ecotourism development	International Journal of Tourism Research	This study examines how community participation affects the sustainability (economic, environmental, and social) of marine protected areas (MPAs) in Malaysia, particularly in relation to the development of ecotourism. Data was collected through a structured questionnaire and analysed using the partial least square method.	The findings show that a substantial portion of the diversity in ecotourism development may be explained by community participation. The results show that the development of ecotourism in both direct and indirect ways advance environmental, social, as well as economic sustainability. This suggests that the development of ecotourism and community participation are essential to attaining sustainable development in MPAs.
Latip N.A.; Jaafar M.; Marzuki A.; Roufechaei K.M.; Umar M.U. [35]  2020	The spectacle of conservation and tourism in protected areas: analysis of management, issues and tourist satisfaction	Planning Malaysia	This study investigates the connection between park management, concerns, and tourist contentment in Kinabalu Park, a protected area. It also explores how environmental issues mediate the relationship between park management and tourist satisfaction. The research involved 351 participants who completed a questionnaire survey at Malaysia's Kinabalu National Park. The data was analysed using Partial Least Squares-Structural Equation Modelling (PLS-SEM).	The study found that park management strongly influences tourist satisfaction and environmental concerns. Additionally, environmental issues act as a mediator between park management and tourist satisfaction. These findings underscore the crucial role of effective park management, particularly in protected areas, in addressing concerns and ensuring positive tourist experiences. The results offer valuable insights for the future conservation and sustainable management of protected areas.

Patwary A.K. [36] 2023	Examining environmentally responsible behaviour, environmental beliefs and conservation commitment of tourists: a path towards responsible consumption and production in tourism	Environmental Science and Pollution Research	This study investigates how environmental beliefs and conservation commitment influence the environmentally responsible behaviour of tourists in Malaysia. They collected data from 1000 tourists through a questionnaire, of which 731 responses were considered for analysis. The researchers employed Structural Equation Modelling with Smart PLS version 3.2 to assess and report the study's measurement and structural models.	The research discovered that environmental beliefs and conservation commitment have a substantial impact on the environmentally responsible behaviour of tourists in Malaysia.
Rassiah P.; Mohd Nasir N.; Khan G.; Munir S. [37] 2022	Stakeholder salience and environmental stewardship among hotels in Malaysia	Sustainability Accounting, Management and Policy Journal	This study investigates stakeholders' influence and impacts on the awareness and attitudes towards environmental management practices (EMPs) among hotel managers in Malaysia. Design/methodology/approach: A total of 159 hotel managers participated in the survey. Structural equation modelling using the partial least squares (PLS) technique was used to test the hypotheses.	This study demonstrates that owners, regulators, and stakeholders significantly influence hotel managers' utilization of Environmental Management Practices (EMPs), awareness of the environment, as well as attitudes toward it. Basic EMPs are typically implemented by managers who are more environmentally conscious, while those with a stronger environmental attitude are inclined to adopt more advanced EMPs. The study underscores the importance of regulatory measures and incentives to enforce environmental practices in the hotel industry, highlighting the potential for a collaborative effort among stakeholders to establish a societal norm supporting sustainability in both the environment and tourism sectors.

<p>Ip-Soo-Ching J.M.; Massingham P.; Pomeroy A. [38]  2022</p>	<p>Managing diverse knowledge systems of tourism operators in vulnerable marine ecosystems: addressing sustainability challenges through nature-based solutions</p>	<p>Asia Pacific Journal of Tourism Research</p>	<p>This study investigates how nature-based tourism operators in coastal ecosystems utilize Knowledge Management (KM) to implement nature-based solutions (NbS) to address sustainability issues. The research employs a qualitative, multiple-case-study approach, gathering interview data across various organizational levels from nine distinct nature-based tourism operations in Australia, Malaysia, Thailand, and Vietnam to explore these knowledge dynamics.</p>	<p>In order to achieve sustainability outcomes, these tourism operators implemented practices for handling diverse knowledge systems. The results we obtained also shed light on how more advanced approaches to this kind of sustainability knowledge management (SKM) may result in more optimal NbS and sustainable tourism outcomes for marine ecosystems that are vulnerable.</p>
<p>Saleem M.A.; Li J.; Afzal H. [39]  2021</p>	<p>Protect for affinity? The role of destination brand engagement in forming environmentally responsible tourist behaviours</p>	<p>Journal of Sustainable Tourism</p>	<p>This study utilizes the Theory of Planned Behaviour (TPB) to investigate environmentally responsible tourist behaviours (ERTB) in an Asian context. An extension of the TPB model is proposed to recognize the limitations of attitude, subjective norms, and behavioural control in predicting ERTB. This extension incorporates the concept of Destination Brand Engagement (DBE) to offer a more comprehensive understanding of how ERTB is shaped, encompassing tourists' deeper connection with a destination beyond immediate travel experiences. The study examines the intention for ERTB and self-reported actual ERTB as anticipated outcomes.</p>	<p>The study employed the TPB-DBE model and utilized the PLS-SEM approach to analyse data gathered from two destinations in Malaysia and Pakistan. The research confirms that attitude, norms, and behavioural control positively influence environmentally responsible tourist behaviours (ERTB). ERTB intention is found to directly predict self-reported ERTB, although the actual behaviour scores are somewhat lower than intention scores. Additionally, Destination Brand Engagement (DBE) plays a significant role in influencing both ERTB intention and actual behaviour, highlighting its potential to enhance the transition from intention to on-site ERTB.</p>



<p>Elfithri R.; Mokhtar M.B.; Abdullah M.P. [40]  2021</p>	<p>Water and environmental sustainability in Langkawi UNESCO Global Geopark, Malaysia: issues and challenges towards sustainable development</p>	<p>Arabian Journal of Geosciences</p>	<p>The study assessed water and environmental sustainability for sustainable development in Langkawi Geopark. This assessment was accomplished through various methods, including stakeholder workshops, field data collection and surveys on water and environmental quality, water quality sampling, distribution of questionnaires to local stakeholders and community members, and in-depth discussions and interviews with relevant entities such as local government agencies, authorities, private organizations, NGOs, and the local community in Langkawi Geopark.</p>	<p>Out of 21 issues, the research determined six important ones pertaining to water and environmental sustainability in Langkawi Geopark. It proposes a strategic recommendation for sustainable development in the area, emphasizing the promotion of sustainability science as a platform to address future water and environmental sustainability challenges. The proposed sustainability science framework outlines eight feasibility aspects, including stock and flow, social, environmental, cultural, institutional and policy considerations, integration, as well as monitoring and evaluation. Furthermore, via the Langkawi Research Centre (LRC), the Community Learning Alliance for Sustainability Science (CLASS) is acknowledged as a vital avenue for promoting sustainability science practices in Langkawi Geopark.</p>
<p>Abdullah S.I.N.W.; Samdin Z.; Ho J.A.; Ng S.I. [41]  2020</p>	<p>Sustainability of marine parks: Is knowledge– attitude–behaviour still relevant?</p>	<p>Environment, Development, and Sustainability</p>	<p>This study investigates tourists' environmental knowledge, considering its factual, conceptual, and procedural dimensions and its impact on attitude and responsible environmental behaviour. The research involved a face-to-face survey with 85 domestic and international marine park tourists, and data analysis was conducted using the PLS-SEM method.</p>	<p>This initial study establishes that environmental knowledge comprises factual, conceptual, and procedural dimensions. It also affirms a direct correlation between knowledge, attitude, and behaviour, with knowledge notably influencing attitude, subsequently leading to increased pro-environmental actions. This underscores the significance of fostering environmental knowledge among marine park tourists to cultivate a pro-environmental attitude and responsible behaviour, ultimately contributing to the advancement of sustainable ecotourism development.</p>

Shazali R.A.; Kamaluddin A.; Sa'ad S.; Khalique M. [42]  2023	Green Intellectual Capital and Sustainable Performance of Hotels in Malaysia	Economic Affairs (New Delhi)	This research investigates how Green Intellectual Capital (GIC), which encompasses green practices and environmental awareness knowledge, relates to the sustainable performance of hotels in Malaysia. Surveys were administered to managers of hotels recognized for their green practices on TripAdvisor. A total of 91 respondents participated in the survey.	The study reveals a strong positive connection between Green Intellectual Capital (GIC) and the sustainable performance of hotels in Malaysia. This highlights GIC as a valuable asset for regional hotels, leading to enhanced performance. Importantly, the research demonstrates that GIC is not limited to manufacturing organizations but also holds competitive advantages in service-oriented industries like hotels and resorts.
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#### 4.2 Theme 2: Environmental Sustainability and Conservation

**Table 4**

The research article's findings are based on the proposed search criterion

Authors	Title	Source Title	Methodology	Results & Findings
Soh A.-N.; Puah C.-H.; Arip M.A. [43]  2022	Identifying Core Indicators of Sustainable Competitiveness for Malaysian Tourism	Asian Journal of Business Research	This study explores the idea of sustainable competitiveness, which connects national productivity with sustainable development. It points out that too many indicators can hinder effective adoption and policy implementation at the industry or country level. The study proposes using the Sustainable Competitiveness Index (SCI) from the World Economic Forum as a comprehensive metric to measure the sustainable competitiveness of tourism in Malaysia.	The study identifies five crucial dimensions for sustainable competitiveness: physical environment, market conditions, human capital, policy environment, as well as technology/innovation. Random forest regression pinpoints 12 key indicators that can guide practitioners, tourism leaders, and policymakers toward sustainable competitiveness. The constructed Tourism Sustainable Competitiveness Index (TSCI) effectively tracks six significant tourism crises. This index can serve as an important early warning tool for crisis management and recovery planning.

<p>Khan M.R.;                  Khan H.U.R.;                  Lim C.K.; Tan                  K.L.; Ahmed                  M.F. [44]                   2021</p>	<p>Sustainable tourism policy,                  destination management,                  and sustainable tourism                  development: A                  moderated-mediation                  model</p>	<p>Sustainability                  (Switzerland)</p>	<p>The study investigates the                  connections between sustainable                  tourism policy, destination                  management, destination social                  responsibility, and tourist value                  orientation in relation to sustainable                  tourism development. The research                  involved managers from 163                  Malaysian companies and employed                  a cross-sectional quantitative                  approach, utilizing partial least                  square structural equation modelling.</p>	<p>The study suggests that sustainable tourism policy,                  destination management, and destination social                  responsibility substantially influence sustainable                  tourism development. Additionally, destination                  social responsibility partially mediates the                  relationship between sustainable tourism policy,                  destination management, and sustainable tourism                  development.</p>
<p>Ching S.-L.;                  Choong Y.-O.;                  Lau L.-S.; Seow                  A.-N.; Choong                  C.-K. [45]                   2022</p>	<p>Sustainable ecotourism                  development strategies                  through strengths,                  weaknesses,                  opportunities, and threats                  analysis: The case of                  Cameron Highlands,                  Malaysia</p>	<p>Business Strategy and                  Development</p>	<p>This paper assesses the sustainability                  of ecotourism in Cameron Highlands                  through a comprehensive analysis                  using a strategic planning technique                  called SWOT analysis (Strengths,                  Weaknesses, Opportunities, Threats).                  The findings from this analysis are                  used to formulate strategies for                  promoting sustainable tourism                  development. The data for this study                  is gathered through questionnaires                  distributed to local experts in the                  Highlands.</p>	<p>This particular research findings reveal that the                  strengths and opportunities in Cameron Highlands                  outweigh its weaknesses and threats. This suggests                  a significant potential for the area to become an                  appealing ecotourism destination in the region.                  However, the Highlands fail to meet sustainability                  standards, primarily due to insufficient                  environmental conservation efforts. The results                  hold crucial implications for policymakers, urging                  them to develop strategies that enhance                  ecotourism while minimizing environmental impact                  in the Highlands.</p>

<p>Janjua Z.A.;                  Krishnapillai                  G.; Rehman                  M. [46]                    2023</p>	<p>Importance of the                  sustainability tourism                  marketing practices: an                  insight from rural                  community-based                  homestays in Malaysia</p>	<p>Journal of Hospitality and                  Tourism Insights</p>	<p>The study investigates the                  relationship between ICT                  competency, sustainable tourism                  marketing, and brand equity in rural                  homestays in Malaysia. It also                  examines how local political support                  contributes to sustainable rural                  tourism development in this context.                  Data was collected through self-                  administered questionnaires to test                  research hypotheses.</p>	<p>This study establishes a model that demonstrates                  the significance of ICT competency, sustainable                  tourism marketing practices, and local political                  support in influencing homestay brand equity. The                  empirical results align well with the theoretical                  framework, contributing to the field of tourism                  sustainability. The research highlights the                  importance of considering the "triple bottom line"                  theory in conjunction with these factors. For                  policymakers, the study underscores the need for                  cost-effectiveness, integrated policies, and                  transparency to achieve sustainable tourism goals                  set by the United Nations and Malaysia. This study                  stands out as an early effort to emphasize the role                  of sustainable tourism marketing and brand equity                  in rural homestays in Malaysia, emphasizing the                  pivotal role of local political authorities in                  sustainable rural tourism development.</p>
<p>Ismail A.;                  Jaafar S.M.R.S.                  [47]                    2022</p>	<p>A Fuzzy Multi-Criteria                  Framework for the                  Development of                  Sustainable Community-                  Based Tourism in Malaysia</p>	<p>Journal of Sustainability                  Science and Management</p>	<p>The study investigates the                  relationship between ICT                  competency, sustainable tourism                  marketing, and brand equity in rural                  homestays in Malaysia. It also                  examines how local political support                  contributes to sustainable rural                  tourism development in this context.                  Data was collected through self-                  administered questionnaires to test                  research hypotheses.</p>	<p>This study introduces a multi-criteria framework                  that empowers stakeholders as decision-makers to                  formulate sustainable plans aligning with                  conservation and rural development strategies. It is                  essential to support stakeholders involved in the                  development of sustainable Community-Based                  Tourism (CBT). It contributes to government policies                  concerning Multi-Hazard Early Warning System                  (MHEP) development in line with Malaysia's rural                  development policy. Sustainable CBT proves to be                  an effective tool for rural economic development,                  promoting broader economic benefits and                  comprehensive spatial development. Additionally,                  this research offers valuable insights for tourism                  policymakers on effective policy interventions                  related to CBT for accelerated sustainable                  development across environmental, economic, and                  sociocultural dimensions.</p>

Salman A.; Jaafar M.; Mohamad D.; Khoshkam M. [48]  2023	Understanding Multi-stakeholder Complexity & Developing a Causal Recipe (fsQCA) for Achieving Sustainable Ecotourism	Environment, Development and Sustainability	The study's objective was to establish a framework for managing multiple stakeholders and assess the mediating effect of stakeholder management on ecotourism sustainability in Penang Hill. Data was gathered from key stakeholders and analysed using SmartPLS and fuzzy-set Qualitative Comparative Analysis (fsQCA).	The research discovered that achieving sustainability in ecotourism requires effective stakeholder management. Recognizing the influence and interests of stakeholders is essential for effective engagement, empowerment, and monitoring strategies. The study provides valuable insights through symmetric and asymmetric techniques, addressing challenges arising from the COVID-19 pandemic and suggesting policy adjustments. Additionally, it contributes to the existing literature by highlighting the mediating role of stakeholder management in achieving sustainable ecotourism in Penang Hill, comparing the overall and indirect effects on support for stakeholder management.
Goh H.C. [49]  2021	Strategies for post-Covid-19 prospects of Sabah's tourist market – Reactions to shocks caused by the pandemic or reflection for sustainable tourism?	Research in Globalization	This viewpoint paper outlines the strategies put forth by both the tourism industry and the government in Sabah, Malaysia, located on Borneo Island, to navigate the current crisis with the aim of securing a more promising future for tourism in the region.	The paper argues that the proposed strategies need a deeper examination regarding their root causes, the beneficiaries of tourism, and the coordinated planning of different types of tourism (sustainable, mass, high-value) for alignment with Sustainable Development Goals. Additionally, it suggests that future research should focus on understanding the relationship between tourism, poverty, and the environment for sustainable development in Sabah.

### 4.3 Theme 3: Tourist Behaviour and Satisfaction

**Table 5**

The research article's findings are based on the proposed search criterion

Authors	Title	Source Title	Methodology	Results & Findings
Kim Lian J.C.; Binti Saikim F.H. [50]  2021	Exploring tour operators' perspectives on responsible tourism at ecotourism destination: Meaning, motivation, and practices	Asia-Pacific Journal of Innovation in Hospitality and Tourism	The paper explores the meaning, motivation, and extent of Responsible Tourism Practices (RTPs) at Lower Kinabatangan, a premier ecotourism destination in Malaysia. Data were collected through 3 focus group interview sessions with 36 respondents: tour operators, lodgers, and homestay operators.	The study reveals that Responsible Tourism Practices (RTP) align with the three pillars of sustainability (environmental, economic, and social) and primarily focus on environmental aspects such as protection, conservation, and sustainability of natural resources. However, there is less emphasis on responsible behaviour and ethical considerations. The paper recommends defining guiding concepts for Economic, Social, and Environmental Responsibility to foster sustainable coexistence between wildlife, local communities, and tourism businesses in Lower Kinabatangan, emphasizing the need for sound guidelines in ensuring balanced development. Further programs for intervention and research are also suggested to improve Responsible Tourism Practices for holistic growth.
Patwary A.K.; Aziz R.C.; Hashim N.A.A.N. [51] 2023	Investigating tourists' intention toward green hotels in Malaysia: a direction on tourist sustainable consumption	Environmental Science and Pollution Research	This study examines international tourists' inclination to visit green hotels in Malaysia, considering factors like green availability, price sensitivity to green options, attitude, and subjective norms. Data was collected through self-administered questionnaires distributed to international tourists in Malaysia. The analysis employed structural equation modelling (PLS-SEM) for assessment.	The study reveals that factors including green price sensitivity, attitude, subjective norm, as well as perceived behavioural control possess a positive influence on tourists' intention to visit green hotels in Malaysia. Additionally, attitude serves as a mediator between green price sensitivity and this intention. This research contributes to the Theory of Planned Behaviour and provides valuable insights for future researchers. It also offers practical recommendations, emphasizing the importance of maintaining environmentally friendly practices in hotels for their survival, growth, and sustainability. It also highlights the significance of understanding guests for effective marketing strategies.

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Foroughi B.; Arjuna N.; Iranmanesh M.; Kumar K.M.; Tseng M.-L.; Leung N. [52]  2022	Determinants of hotel guests' pro-environmental behaviour: Past behaviour as moderator	International Journal of Hospitality Management	This study uses past behaviour as a moderator to explore the determinants of hotel guests' pro- environmental behaviour. The study used the partial least square technique to analyse data from 322 hotel guests in Malaysia.	The research shows how environmental knowledge and concern affect social and emotional values related to the environment. Notably, environmental and social value strongly influences pro- environmental behaviour in hotel guests and mediates the effects of knowledge and concern. Furthermore, the relationship between environmental social values as well as pro- environmental action is negatively impacted by past behaviour. According to cognitive appraisal theory, this study improves knowledge of sustainable tourism and environmental behaviour by highlighting the critical role that environmental social values play in influencing pro-environmental behaviour.
Hassan H.; Abdullah N.H. [53]  2020	Sustainable tourist behaviour in adventure tourism	Journal of Advanced Research in Dynamical and Control Systems	This study aims to investigate the influence of perceived values on sustainable tourist behaviour among adventure travellers, specifically in the conservation of frequently visited natural areas. The research focuses on tourist engagement in activities like soft and hard adventure tourism, which has garnered significant interest in Malaysia and beyond. A survey involving 317 valid questionnaires was conducted in Malaysia for this study.	According to this research, adventure tourists exhibit positive, sustainable tourist behaviours. The outcomes of the multiple regression analysis demonstrate that their sustainable tourist behaviour is congruent with the thrill, emotional, as well as learning values.

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#### 4.4 Theme 4: Education and Perception

**Table 6**

The research article's findings are based on the proposed search criterion

Authors	Title	Source Title	Methodology	Results & Findings
Yusoff Y.M.; Nejati M.; Kee D.M.H.; Amran A. [54]  2020	Linking Green Human Resource Management Practices to Environmental Performance in the Hotel Industry	Global Business Review	This study investigates the connection between green Human Resource Management (HRM) practices (covering aspects like recruitment, training, performance appraisal, and compensation) and environmental performance within Malaysia's hotel industry. Surveys were administered to HR managers/executives in 3-, 4-, and 5-star hotels, with 206 hotels participating. The collected data underwent analysis using partial least squares structural equation modelling.	The study found that green recruitment, training, and compensation are positively linked to environmental performance, while green performance appraisal showed no significant connection. These results contribute by emphasizing the specific impact of green HRM practices on environmental performance. This research is pioneering in examining the relationship between environmental performance and green HRM within the hotel industry.
Ngah A.H.; Rahimi A.H.M.; Gabarre S.; Saifulizam N.I.F.C.; Aziz N.A.; Han H. [55]  2021	Voluntourism sustainability: a case of Malaysian east coast island destinations	Asia Pacific Journal of Tourism Research	The authors aim to unearth the factors influencing voluntarists' behaviours in this study. A quantitative approach and a field survey at three Malaysian east coast island destinations are used.	The research demonstrates that attitude and satisfaction are highly influenced by environmental concern and intrinsic motivation, and this turns critical to voluntarists' intention to maintain their motivation for volunteering. This notion uses satisfaction as a mediator. This particular study adds to the body of knowledge and provides pertinent data that local governments and voluntourism organizations may use to create more efficient strategies and regulations to support voluntourism across the globe.



<p>Asadi S.; OmSalameh Pourhashemi S.; Nilashi M.; Abdullah R.; Samad S.; Yadegaridehko rdi E.; Aljojo N.; Razali N.S. [56]</p>	<p>Investigating the influence of green innovation on sustainability performance: A case on the Malaysian Hotel Industry</p>	<p>Journal of Cleaner Production</p>	<p>The present study aimed to investigate the factors influencing the adoption of green innovation and its potential effects on the performance of the hotel industry. Data collection was performed through inspection of 183 hotels in Malaysia. Data analysis was carried out employing the partial least squares method.</p>	<p>The research discovered that environmental and economic performance significantly and positively influence green innovation in the hotel industry. This demonstrates how crucial green innovation is to encouraging sustainable performance in hospitality. Policymakers and hotel management might benefit from the suggested model and discover influencing elements in comprehending the motivations behind adopting green practices in the industry.</p>
<p>2020</p>				
<p>Nordin A.O.S.; Ismail F.; Jamal N.Y.M. [57]</p>	<p>Impact of tourism development on the quality of life: A case study of Perhentian Island, Malaysia</p>	<p>African Journal of Hospitality, Tourism and Leisure</p>	<p>This study aimed to understand the local community's views on the effects of tourism development on Perhentian Island, including sociocultural, economic, and environmental impacts. It also explored how these impacts relate to the local community's quality of life. The research gathered quantitative data from 272 local community members through a household survey using purposive sampling on Perhentian Island.</p>	<p>The study shows that, according to the local community, the positive effects of tourism development on their quality of life surpass the negative impacts. Specifically, social-cultural and economic benefits positively correlate with quality of life, while social-cultural and environmental costs have a negative relationship. Because they provide information on the strategic and sustainable development of tourism in destinations, these results are important for both planners and developers.</p>
<p>2020</p>				

Chan J.K.L. [58] 2023	Sustainable Rural Tourism Practices from the Local Tourism Stakeholders' Perspectives	Global Business and Finance Review	This paper provides empirical insights into rural tourism stakeholders' adoption of sustainable practices. It delves into the meaning and motivations behind their adoption of sustainable tourism practices and offers recommendations for enhancing them. The study focuses on individuals' perspectives on sustainable tourism practices, including their understanding, motivations, and areas for improvement. Data was collected through semi-structured interviews involving 29 rural tourism operators in Sabah, Malaysia.	The study uncovers that sustainable tourism practices encompass conservation, economic benefits, collaboration, environmental impact, and meeting tourists' needs. It emphasizes the significance of fairness, competitive products, and quality attractions in defining sustainable tourism practices. The research highlights key drivers like economic, social, and environmental factors and government support, suggesting that increased collaboration, conservation, and 3Rs practices are crucial for enhancing sustainable rural tourism. These findings hold implications for rural tourism destination management and stakeholders in elevating the sustainability of rural sites and destinations, contributing to the existing literature in this field.
Shazali R.A.; Kamaluddin A.; Sa'ad S.; Khaliq M. [59] 2023	Green Intellectual Capital Measurement in The Hotel Industry: The Developing Country Study	Corporate Governance and Organizational Behaviour Review	The current study employs a case study approach where five interviews were conducted with different personnel in Malaysia's tourism and hotel sector.	Pertaining to the GIC model, the research discovered eighteen indicators. The GIC model helps the company meet customer demands on environmental issues, create value for the business, as well as comply with environmental regulations.
Yang L.; Wang C.; Yu H.; Yang M.; Wang S.; Chiu A.S.F.; Wang Y. [60] 2020	Can an island economy be more sustainable? A comparative study of Indonesia, Malaysia, and the Philippines	Journal of Cleaner Production	This study built an energy-based framework to assess the sustainability of three island states in a time series (2000, 2005, 2010, and 2015).	The results highlight distinct features for each country: Indonesia has the highest total energy, while Malaysia shows the highest energy use per capita. Renewable resource fractions are declining over time in all countries, with Indonesia experiencing the largest decrease. The study suggests the importance of improving energy efficiency through technological innovations, reducing fossil fuel subsidies, and strengthening pollution control for sustainability in similar island economies.

<p>Hong K.T.; Ng S.I.; Ho J.A.; Wong S.C.; Rathakrishnan T. [61]  2023</p>	<p>Stakeholders' Perception of Malaysia's Edu-Tourism Sustainability Performance</p>	<p>Electronic Journal of Applied Statistical Analysis</p>	<p>This study assesses international students' satisfaction with Malaysia as a study destination, which is crucial for Malaysia's goal of becoming an educational hub in Asia. Data was gathered through questionnaires from 264 international students across both public and private universities. The research employs structural equation modelling with SMARTPLS software and descriptive analysis to identify key indicators of Malaysia's performance in edu-tourism sustainability.</p>	<p>The study finds that Malaysia's edu-tourism sustainability performance currently falls within the "potentially sustainable" category, indicating the need for improvements to reach a "sustainable" status. Among the indicators assessed, six performed moderately, with factors like university reputation and study environment showing potential for enhancement. Notably, perceived quality of electronic communications and student-administrator interaction were the highest-performing indicators, while social links and geographic proximity scored lower.</p>
<p>Tritto A. [62]  2020</p>	<p>Environmental management practices in hotels at world heritage sites</p>	<p>Journal of Sustainable Tourism</p>	<p>This study addresses a research gap by introducing a new taxonomy and framework that encompasses both tangible and intangible heritage. The research methodology involved conducting 25 interviews and surveying 124 hotels across two sites. The study aims to investigate Environmental Management Practices (EMPs), their influencing factors, and potential connections between environmental performance and heritage aspects.</p>	<p>Using fewer Environmental Management Practices (EMPs) in heritage areas, low-cost lodging is the norm. Guesthouses and boutique hotels, on the other hand, use an assortment of EMPs, integrating technology with traditional knowledge, and are more customer-focused. Customers possess a negative influence on EMP adoption, while the factors that determine adoption typically come from personal beliefs and information sharing with stakeholders, including traditional heritage firms. The study advances the understanding of EMP adoption in World Heritage Sites (WHSs), emphasizing that EMPs can encompass both technological and traditional approaches in a heritage context.</p>

## 5. Discussion and Conclusion

The collective findings of these studies in Theme 1 underscore the critical role of various factors in achieving sustainable development in different contexts. Community participation is a significant driver of ecotourism development, which is pivotal in fostering economic, social, and environmental sustainability, particularly within Marine Protected Areas (MPAs). Effective Park management is essential for ensuring positive tourist experiences and addressing environmental concerns, emphasizing the importance of sound management practices in protected areas. Furthermore, the influence of conservation commitment, environmental beliefs, as well as regulatory measures on environmentally responsible behaviour and practices in the tourism and hotel industry demonstrates the need for collaborative efforts and policy interventions to establish sustainable norms. Additionally, the studies shed light on the importance of knowledge management and the role of sophisticated approaches, such as Sustainability Knowledge Management (SKM), in optimizing outcomes for vulnerable marine ecosystems. These findings collectively emphasize the multifaceted nature of sustainable development, indicating that community involvement, effective management, regulatory measures, and knowledge-based approaches are key in advancing sustainability across various sectors and environments.

The collective findings of these studies under Theme 2 provide valuable insights into various aspects of sustainable tourism and development. The first study identifies key dimensions and indicators for sustainable competitiveness, offering a valuable tool for practitioners and policymakers to navigate towards sustainability and providing a crucial early warning system for crisis management. The second study emphasizes the significant influence of sustainable tourism policy, destination management, and destination social responsibility on sustainable tourism development, underscoring the interconnectedness of these factors. In the case of Cameron Highlands, the study highlights its potential as an ecotourism hotspot, though challenges persist in meeting sustainability standards, particularly in environmental conservation. The fourth study introduces a multi-criteria framework empowering stakeholders to devise sustainable plans, a crucial tool for developing Community-Based Tourism (CBT) and aligning with Malaysia's rural development policy. Stakeholder management emerges as a critical factor in achieving sustainability of ecotourism, reinforcing the importance of effectively understanding and engaging stakeholders. Lastly, the paper underscores the need for deeper examination and coordinated planning of tourism strategies in Sabah to align with Sustainable Development Goals, highlighting the complexity of sustainable tourism development. Together, these studies contribute valuable knowledge and recommendations for advancing sustainability within the tourism industry.

The studies collectively from Theme 3 shed light on various facets of sustainable tourism practices. In the case of Responsible Tourism Practices (RTP), the focus predominantly lies on environmental aspects, encompassing protection, conservation, and sustainability of natural resources. However, the paper underscores the need to emphasize responsible behaviour and ethical considerations. Recommendations include establishing guiding principles for Economic, Social, and Environmental Responsibility to facilitate a harmonious coexistence between wildlife, local communities, and tourism businesses in Lower Kinabatangan, with the importance of sound guidelines highlighted for balanced development. The research on green hotels in Malaysia emphasizes the significance of factors like green price sensitivity, attitude, subjective norm, as well as perceived behavioural control in determining tourists' intention to make the trip to such establishments. Attitude plays a mediating role, underlining its importance in shaping guest preferences. Understanding these dynamics is crucial for hotels' survival, growth, and sustainability, urging a continued commitment to environmentally friendly practices. Additionally, insights into environmental behaviour and sustainable tourism

emerge from the study on hotel guests. Environmental knowledge and concern shape emotional and social values linked to the environment, with environmental social value proving to be a key driver of pro-environmental behaviour. This underscores the role of cognitive appraisal theory in understanding and fostering environmentally responsible actions. The research on adventure tourists highlights their positive, sustainable behaviour, with values like thrill, emotion, and learning to align with their environmentally conscious choices. Together, these studies contribute valuable knowledge and recommendations for advancing sustainability within the tourism industry.

These studies collectively under Theme 4 provide valuable insights into various aspects of sustainable practices in different domains. The research on green HRM practices in the hotel industry highlights the specific impact of recruitment, training, and compensation on environmental performance, offering a pioneering contribution to this area. Additionally, the findings on voluntourism emphasize the critical roles of environmental concern and intrinsic motivation in sustaining volunteer activities, with satisfaction acting as a mediator. In the context of hotel innovation, the study underscores the significance of environmental and economic performance in driving green practices, providing valuable guidance for policymakers and hotel managers. Moreover, the examination of tourism development's impact on local communities underscores the potential for positive effects on quality of life, with implications for strategic and sustainable development in destinations. The research done on sustainable tourism practices in rural areas highlights the significance of fairness, competitive products, and quality attractions, highlighting key drivers for sustainability. Finally, investigating GIC indicators and energy analysis in island economies stresses the need for improved energy efficiency and sustainable practices for long-term viability. These findings collectively contribute to the body of knowledge in their respective domains, offering practical implications for stakeholders and policymakers aiming to enhance sustainability in various sectors.

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### References

- [1] Newell, Graeme, and Muhammad Jufri Marzuki. "The increasing importance of environmental sustainability in global real estate investment markets." *Journal of Property Investment & Finance* 40, no. 4 (2022): 411-429. <https://doi.org/10.1108/JPIF-01-2022-0005>
- [2] Yu, Tai-Kuei, Feng-Yi Lin, Kai-Yun Kao, and Tai-Yi Yu. "Encouraging environmental commitment to sustainability: An empirical study of environmental connectedness theory to undergraduate students." *Sustainability* 11, no. 2 (2019): 342. <https://doi.org/10.3390/su11020342>
- [3] Heim, Irina, Anne Crowley Vigneau, and Yelena Kalyuzhnova. "Environmental and socio-economic policies in oil and gas regions: triple bottom line approach." *Regional Studies* 57, no. 1 (2023): 181-195. <https://doi.org/10.1080/00343404.2022.2056589>
- [4] Neo, En Xin, Khairunnisa Hasikin, Mohd Istajib Mokhtar, Khin Wee Lai, Muhammad Mokhzaini Azizan, Sarah Abdul Razak, and Hanees Farzana Hizaddin. "Towards integrated air pollution monitoring and health impact assessment using federated learning: a systematic review." *Frontiers in Public Health* 10 (2022): 851553. <https://doi.org/10.3389/fpubh.2022.851553>
- [5] Khattak, Muhammad Adil, Mohammad Azfar Haziq, Nur Ainida, Tuan Mohamad Hakimi, and Sakeshraj Narajah. "Deterministic Safety Analysis for High Level Waste (Spent Fuel): Management of NPP, A Review." *Progress in Energy and Environment* (2018): 62-74.
- [6] Md Hanafiah, Faizal, Muhammad Aqmarul Azri Azmi, Siti Halipah Ibrahim, and Zainal Md Zan. "The effect of sustainable development on environmental agenda. Case study: Putrajaya Green City, Malaysia." (2020): 728-736.
- [7] Rahman, Muhammad Khalilur, Muhammad Mehedi Masud, Rulia Akhtar, and Mohammad Mainul Hossain. "Impact of community participation on sustainable development of marine protected areas: Assessment of ecotourism development." *International Journal of Tourism Research* 24, no. 1 (2022): 33-43. <https://doi.org/10.1002/jtr.2480>

- [8] Kunjuraman, Velan. "Local community participation challenges in community-based ecotourism development in Sabah, Malaysian Borneo." *Community Development Journal* 57, no. 3 (2022): 487-508. <https://doi.org/10.1093/cdj/bsaa065>
- [9] Ching, Suet-Ling, Yuen-Onn Choong, Lin-Sea Lau, Ai-Na Seow, and Chee-Keong Choong. "Sustainable ecotourism development strategies through strengths, weaknesses, opportunities and threats analysis: The case of Cameron Highlands, Malaysia." *Business Strategy & Development* 5, no. 2 (2022): 110-116. <https://doi.org/10.1002/bsd2.141>
- [10] Lim, Seng Boon, Jalaluddin Abdul Malek, Mohd Fadzil Abdul Rashid, and Yong Chee Kong. "Rethinking density in urban planning: Policy directions in the post-COVID-19 era in Malaysia." *Planning Malaysia* 19 (2021). <https://doi.org/10.21837/pm.v19i16.947>
- [11] Thong, Jun-Zhou, May-Chiun Lo, Mohamad Kadim Suaidi, Abang Azlan Mohamad, and Chee-Hua Chin. "Tourists' Perceived Destination Competitiveness in Protected Areas: The Case of Semenggoh Nature Reserve." *The Journal of Social Sciences Research* 5, no. 11 (2019): 1600-1608. <https://doi.org/10.32861/jssr.511.1600.1608>
- [12] Scriosteianu, Adriana, Cătălin Mihail Barbu, and Maria Magdalena Criveanu. "Sustainable tourism in the current European context." In *Managing risk and decision making in times of economic distress, part B*, pp. 17-36. Emerald Publishing Limited, 2022. <https://doi.org/10.1108/S1569-37592022000108B031>
- [13] Hasana, Uswathul, Sampada Kumar Swain, and Babu George. "Management of ecological resources for sustainable tourism: A systematic review on community participation in ecotourism literature." *International Journal of, Management of Ecological Resources for Sustainable Tourism: A Systematic Review on Community Participation in Ecotourism Literature (January 01, 2022)*. Hasana, U., Swain, SK, & George, B (2022). <https://doi.org/10.26668/businessreview/2022.v7i1.269>
- [14] Cavalcante, William Quezado de F., Arnaldo Coelho, and Cristela Maia Bairrada. "Sustainability and tourism marketing: A bibliometric analysis of publications between 1997 and 2020 using vosviewer software." *Sustainability* 13, no. 9 (2021): 4987. <https://doi.org/10.3390/su13094987>
- [15] Sahahiri, Riyan Mohammed, Amy L. Griffin, and Qian Sun. "Investigating ecotourism opportunities measurements in a Complex Adaptive System: a systematic literature review." *Sustainability* 15, no. 3 (2023): 2678. <https://doi.org/10.3390/su15032678>
- [16] Ismail, Fadillah, Amina Imran, Nohman Khan, and Muhammad Imran Qureshi. "Past, present and future of ecotourism, a systematic literature review from last decade." *Studies of Applied Economics* 39, no. 4 (2021). <https://doi.org/10.25115/eea.v39i4.4592>
- [17] Kusumawardhana, Indra, Diena Mutiara Lemy, Theodosia C. Nathalia, and Yustisia Kristiana. "Towards a common goal for a sustainable tourism destination: Case study of Biak Numfor, Papua, Indonesia." In *IOP Conference Series: Earth and Environmental Science*, vol. 729, no. 1, p. 012097. IOP Publishing, 2021. <https://doi.org/10.1088/1755-1315/729/1/012097>
- [18] Deshmukh, Arvind, and Neelam Saxena. "Designing Sustainable Business Models." *ECS Transactions* 107, no. 1 (2022): 11153. <https://doi.org/10.1149/10701.11153ecst>
- [19] Isa, Eleen Dayana Mohamed, Kamyar Shameli, Roshafima Rasit Ali, and Vekes Balasundram. "Advances in nanocellulose based materials as adsorbent for wastewater treatment." *Journal of Research in Nanoscience and Nanotechnology* 5, no. 1 (2022): 43-64. <https://doi.org/10.37934/jrnn.5.1.4364>
- [20] H. C. Yee, K. T. Jing, and T. S. Chin. "Overview of the Green Building Index and factors affecting the willingness of the public to purchasing green residence," *Prog. Energy Environ.*, vol. 25, (2023): 33–43. <https://doi.org/10.37934/progee.25.1.3343>
- [21] Yow, Hui Ming, Amir Abdul Razak, and Adel Aboulqasim Alheemar. "Current energy recycling technology for agricultural waste in Malaysia." *Progress in Energy and Environment* (2024): 11-22. <https://doi.org/10.37934/progee.27.1.1122>
- [22] Gulati, Shruti. "Social and sustainable: exploring social media use for promoting sustainable behaviour and demand amongst Indian tourists." *International Hospitality Review* 36, no. 2 (2021): 373-393. <https://doi.org/10.1108/IHR-12-2020-0072>
- [23] Midgett, Chelsea, Cynthia S. Deale, Alleah Crawford, Melvin Weber, and Joshua Bendickson. "A cross-case analysis of barriers to sustainability in small tourism accommodation enterprises in Dare County, North Carolina." *Tourism and hospitality research* 20, no. 2 (2020): 144-156. <https://doi.org/10.1177/1467358419831425>
- [24] Batala, Lochan Kumar, Kalpana Regmi, GiriRaj Sharma, and Azmat Ullah. "Exploration of national tourism development, innovation and marketing policies: A case study of Nepal tourism constraints." *American Journal of Industrial and Business Management* 9, no. 2 (2019): 403-425. <https://doi.org/10.4236/ajibm.2019.92027>
- [25] H. Abeer. "Institutional Restrictions and Barriers To The Development of The Tourism Services Market," *Ekon. I Upr. Probl. Resheniya*, vol. 3/4, no. 139, (2023): 137–141. <https://doi.org/10.36871/ek.up.p.r.2023.03.04.019>

- [26] Tseng, Ming-Lang, Chunyi Lin, Chun-Wei Remen Lin, Kuo-Jui Wu, and Thitima Sriphon. "Ecotourism development in Thailand: Community participation leads to the value of attractions using linguistic preferences." *Journal of cleaner production* 231 (2019): 1319-1329. <https://doi.org/10.1016/j.jclepro.2019.05.305>
- [27] Assefa, Biniam, and Ferede Meseret. "Ecotourism Development As A Tool For Sustainable Environmental Conservation And Its Implication To Community Livelihood: The Case Of The Sheka Biosphere Reserve, South West Ethiopia." *International Journal of Tourism & Hospitality Reviews* 7 (2020): 20-30. <https://doi.org/10.18510/ijthr.2020.723>
- [28] Aseres, Sintayehu Aynalem, and Raminder Kaur Sira. "Ecotourism development in Ethiopia: Costs and benefits for protected area conservation." *Journal of Ecotourism* 20, no. 3 (2021): 224-249. <https://doi.org/10.1080/14724049.2020.1857390>
- [29] Rozimah, R., and O. S. Khairulmaini. "Highland regions—land use change threat and integrated river basin management." *International Journal of Applied Environmental Sciences* 11, no. 6 (2016): 1509-1521.
- [30] Hashim, Tengku Mohd Zarawie Tengku, Mohd Nazip Suratman, Harinder Rai Singh, Jasmee Jaafar, and Ahmad Naqiyuddin Bakar. "Status and Sustainability of Mangrove Forests: A Case Study from Merbok Mangrove Reserve, Kedah, Malaysia." In *IOP Conference Series: Earth and Environmental Science*, vol. 1019, no. 1, p. 012023. IOP Publishing, 2022. <https://doi.org/10.1088/1755-1315/1019/1/012023>
- [31] Ruggieri, Giovanni, and Patrizia Calò. "Tourism Dynamics and Sustainability: A Comparative Analysis between Mediterranean Islands—Evidence for Post-COVID-19 Strategies." *Sustainability* 14, no. 7 (2022): 4183. <https://doi.org/10.3390/su14074183>
- [32] Lim, Chen-Kim, Kian-Lam Tan, and Minhaz Farid Ahmed. "Conservation of culture heritage tourism: A case study in Langkawi Kubang Badak Remnant Charcoal Kilns." *Sustainability* 15, no. 8 (2023): 6554. <https://doi.org/10.3390/su15086554>
- [33] Sakolnakorn, Thongphon Promsaka Na. "Important factors and policies that contributed to tourism in Malaysia between 1991 and 2018." *International Journal of Innovation, Creativity and Change* 14, no. 12 (2020): 969-980.
- [34] Adapted from Moher, D. "PRISMA 2009 Flow Diagram."
- [35] Latip, Normah Abdul, Mastura Jaafar, Azizan Marzuki, Kamand Mohammadzadeh Roufechaei, and Mohd Umzarulazijo Umar. "Spectacle of conservation and tourism in protected areas: Analysis of management, issues and tourist satisfaction." *Planning Malaysia* 18 (2020). <https://doi.org/10.21837/pm.v18i14.847>
- [36] Patwary, Ataul Karim. "Examining environmentally responsible behaviour, environmental beliefs and conservation commitment of tourists: a path towards responsible consumption and production in tourism." *Environmental Science and Pollution Research* 30, no. 3 (2023): 5815-5824. <https://doi.org/10.1007/s11356-022-22577-w>
- [37] Rassiah, Puspavathy, Norita Mohd Nasir, Ghazala Khan, and Sa'adiah Munir. "Stakeholder salience and environmental stewardship among hotels in Malaysia." *Sustainability Accounting, Management and Policy Journal* 13, no. 5 (2022): 1201-1228. <https://doi.org/10.1108/SAMPJ-06-2021-0221>
- [38] Ip-Soo-Ching, Jean Marie, Peter Massingham, and Alan Pomeroy. "Managing diverse knowledge systems of tourism operators in vulnerable marine ecosystems: addressing sustainability challenges through nature-based solutions." *Asia Pacific Journal of Tourism Research* 27, no. 4 (2022): 333-356. <https://doi.org/10.1080/10941665.2022.2061364>
- [39] Saleem, Muhammad Abid, Jing Li, and Hannan Afzal. "Protect for affinity? The role of destination brand engagement in forming environmentally responsible tourist behaviours." *Journal of Sustainable Tourism* 29, no. 8 (2021): 1344-1364. <https://doi.org/10.1080/09669582.2020.1835932>
- [40] Elfithri, Rahmah, Mazlin Bin Mokhtar, and Md Pauzi Abdullah. "Water and environmental sustainability in Langkawi UNESCO Global Geopark, Malaysia: issues and challenges towards sustainable development." *Arabian Journal of Geosciences* 14, no. 12 (2021): 1168. <https://doi.org/10.1007/s12517-021-07537-x>
- [41] Abdullah, Siti Intan Nurdiana Wong, Zaiton Samdin, Jo Ann Ho, and Siew Imm Ng. "Sustainability of marine parks: Is knowledge—attitude—behaviour still relevant?." *Environment, Development and Sustainability* 22 (2020): 7357-7384. <https://doi.org/10.1007/s10668-019-00524-z>
- [42] Shazali, Rabiaa Adawiyah, Amrizah Kamaluddin, Shukriah Sa'ad, and Muhammad Khalique. "Green Intellectual Capital and Sustainable Performance of Hotels in Malaysia." (2023): 1041-1052.
- [43] Soh, Ann-Ni, Chin-Hong Puah, and Mohammad Affendy Arip. "Identifying core indicators of sustainable competitiveness for Malaysian tourism." *Asian Journal of Business Research Volume* 12, no. 3 (2022). <https://doi.org/10.14707/ajbr.220136>
- [44] Khan, Mustafa Rehman, Haseeb Ur Rehman Khan, Chen Kim Lim, Kian Lam Tan, and Minhaz Farid Ahmed. "Sustainable tourism policy, destination management and sustainable tourism development: A moderated-mediation model." *Sustainability* 13, no. 21 (2021): 12156. <https://doi.org/10.3390/su132112156>

- [45] Ching, Suet-Ling, Yuen-Onn Choong, Lin-Sea Lau, Ai-Na Seow, and Chee-Keong Choong. "Sustainable ecotourism development strategies through strengths, weaknesses, opportunities and threats analysis: The case of Cameron Highlands, Malaysia." *Business Strategy & Development* 5, no. 2 (2022): 110-116. <https://doi.org/10.1002/bsd2.141>
- [46] Janjua, Zain ul Abedin, Gengeswari Krishnapillai, and Mobashar Rehman. "Importance of the sustainability tourism marketing practices: an insight from rural community-based homestays in Malaysia." *Journal of Hospitality and Tourism Insights* 6, no. 2 (2023): 575-594. <https://doi.org/10.1108/JHTI-10-2021-0274>
- [47] Ismail, Azizah, and Syed Muhammad Rafy Syed Jaafar. "A fuzzy multi-criteria framework for the development of sustainable community-based tourism in Malaysia." *Journal of Sustainability Science and Management* 17, no. 9 (2022): 114-125. <https://doi.org/10.46754/jssm.2022.09.008>
- [48] Salman, Ahmad, Mastura Jaafar, Diana Mohamad, and Mana Khoshkam. "Understanding multi-stakeholder complexity & developing a causal recipe (fsQCA) for achieving sustainable ecotourism." *Environment, Development and Sustainability* 25, no. 9 (2023): 10261-10284. <https://doi.org/10.1007/s10668-022-02488-z>
- [49] Goh, Hong Ching. "Strategies for post-Covid-19 prospects of Sabah's tourist market—Reactions to shocks caused by pandemic or reflection for sustainable tourism?." *Research in Globalization* 3 (2021): 100056. <https://doi.org/10.1016/j.resglo.2021.100056>
- [50] Lian, Jennifer Chan Kim, and Binti Saikim Fiffy Hanisdah. "Exploring tour operators' perspectives on responsible tourism at ecotourism destination: meaning, motivation, and practices." (2021): 23-40.
- [51] Patwary, Ataul Karim, Roslizawati Che Aziz, and Nik Alif Amri Nik Hashim. "Investigating tourists' intention toward green hotels in Malaysia: a direction on tourist sustainable consumption." *Environmental Science and Pollution Research* 30, no. 13 (2023): 38500-38511. <https://doi.org/10.1007/s11356-022-24946-x>
- [52] Foroughi, Behzad, Nanthini Arjuna, Mohammad Iranmanesh, Kavightha Mohan Kumar, Ming-Lang Tseng, and Nelson Leung. "Determinants of hotel guests' pro-environmental behaviour: Past behaviour as moderator." *International Journal of Hospitality Management* 102 (2022): 103167. <https://doi.org/10.1016/j.ijhm.2022.103167>
- [53] H. Hassan and N. H. Abdullah. "Sustainable tourist behavior in adventure tourism," *Journal of Advanced Research in Dynamical and Control Systems*, vol. 12, no. 7, (2020): 424–428. <https://doi.org/10.5373/JARDCS/V12I7/20202023>
- [54] Yusoff, Yusmani Mohd, Mehran Nejati, Daisy Mui Hung Kee, and Azlan Amran. "Linking green human resource management practices to environmental performance in hotel industry." *Global Business Review* 21, no. 3 (2020): 663-680. <https://doi.org/10.1177/0972150918779294>
- [55] Ngah, Abdul Hafaz, Abdul Halim Mohd Rahimi, Serge Gabarre, Nor Ida Fatimah Che Saifulizam, Norzalita Abdul Aziz, and Heesup Han. "Voluntourism sustainability: a case of Malaysian east coast island destinations." *Asia Pacific Journal of Tourism Research* 26, no. 12 (2021): 1364-1385. <https://doi.org/10.1080/10941665.2021.1983622>
- [56] Asadi, Shahla, Seyedeh OmSalameh Pourhashemi, Mehrbakhsh Nilashi, Rusli Abdullah, Sarminah Samad, Elaheh Yadegaridehkordi, Nahla Aljojo, and Nor Shahidayah Razali. "Investigating influence of green innovation on sustainability performance: A case on Malaysian hotel industry." *Journal of cleaner production* 258 (2020): 120860. <https://doi.org/10.1016/j.jclepro.2020.120860>
- [57] Nordin, A. O. S., F. Ismail, and N. Y. M. Jamal. "Impact of tourism development on the quality of life: A case study of Perhentian Island, Malaysia." *African Journal of Hospitality, Tourism and Leisure* 9, no. 3 (2020): 22-37. <https://doi.org/10.46222/ajhtl.19770720-2>
- [58] Chan, Jennifer Kim Lian. "Sustainable rural tourism practices from the local tourism stakeholders' perspectives." *Global Business & Finance Review* 28, no. 3 (2023): 136. <https://doi.org/10.17549/gbfr.2023.28.3.136>
- [59] Shazali, Rabiaal Adawiyah, Amrizah Kamaluddin, Shukriah Sa'ad, and Muhammad Khaliq. "Green intellectual capital measurement in the hotel industry: The developing country study." *Corporate Governance and Organizational Behavior Review* 7, no. 3 (2023): 80-89. <https://doi.org/10.22495/cgobr7i3p7>
- [60] Yang, Lan, Chengdong Wang, Huajun Yu, Meijie Yang, Shoubing Wang, Anthony SF Chiu, and Yutao Wang. "Can an island economy be more sustainable? A comparative study of Indonesia, Malaysia, and the Philippines." *Journal of Cleaner Production* 242 (2020): 118572. <https://doi.org/10.1016/j.jclepro.2019.118572>
- [61] Hong, Kay Tze, Siew Imm Ng, Jo Ann Ho, Siew Chin Wong, and Thanuja Rathakrishnan. "Stakeholder's perception on Malaysia's edu-tourism sustainability performance." *Electronic Journal of Applied Statistical Analysis* 16, no. 1 (2023): 50-79.
- [62] Tritto, Angela. "Environmental management practices in hotels at world heritage sites." *Journal of Sustainable Tourism* 28, no. 11 (2020): 1911-1931. <https://doi.org/10.1080/09669582.2020.1771566>