

Forest Tourism in Southeast Asia: A Bibliometric Analysis

Anang Dwi Santoso ^{1, *}, Sajida Sajida ², and Yusnaini Yusnaini ³

AFFILIATIONS

- ¹ Department of Public Administration, Universitas Sriwijaya, Ogan Ilir, Indonesia.
 - ² Department of Public Administration, Universitas Sebelas Maret, Surakarta, Indonesia.
 - ³ Department of Sociology, Universitas Sriwijaya, Ogan Ilir, Indonesia.
- * Corresponding author: anangdwi@fisip.unsi.ac.id

ABSTRACT

With the potential to bring about considerable economic, social, and environmental advantages, forest tourism has emerged as a crucial industry for sustainable development in Southeast Asia. However, one of the biggest challenges is figuring out how to balance the consumption of natural resources with their conservation. As a result, this study uses bibliometric analysis to shed light on Southeast Asian forest tourism research. The Bibliometric R program was used in this study to assess a total of 174 articles that were chosen from the Scopus database using search criteria that included keywords such as forest, forestry, tourism, and touristry, limited to English-language journal articles from South Asian countries. The findings revealed that the key areas of focus in the analyzed studies centered on conservation and ecotourism. This bibliometric analysis also reveals periodic growth in forest tourism research, likely driven by increasing global and regional awareness of sustainable development goals, the economic potential of ecotourism, and the need to balance conservation with tourism activities. Additionally, the consistent pattern of author and institutional collaboration may be attributed to the interdisciplinary nature of forest tourism research, which often requires expertise from fields such as environmental science, sociology, and economics, fostering partnerships across institutions. These results offer insights into the development of future studies in forest tourism as well as empirical evidence to build strategies and policies for creating sustainable forest tourism.

RECEIVED 2023-06-01
ACCEPTED 2024-12-17

COPYRIGHT © 2024 by Forest and Society. This work is licensed under a Creative Commons Attribution 4.0 International License

KEYWORDS

Sustainable Development; Southeast Asia; Forest Tourism; Bibliometric Analysis; Scopus.

1. INTRODUCTION

Southeast Asia's forests extant and bio and cultural diversity has made the region a desirable location for forest tourism (Pan et al., 2008; Stibig et al., 2014; Zoletto & Cicuzza, 2022). Moreover, Southeast Asia state and civil society actors seeks to revitalize the practice of social forestry (Wong et al., 2020). Southeast Asia has higher quantities of forests in comparison to its population (FAO, 2010). Intertidal mangrove forests, which are the most biodiverse woodlands globally, cover much of the coastline of Southeast Asia and offer economic and ecological advantages for numerous coastal inhabitants (Friess, 2017). The rich and varied wildlife of Southeast Asia has several commercial prospects for promoting tourism expansion while also preserving biodiversity (Mandai Nature, 2020). The subregional report for Southeast Asia in the Food and Agriculture Organization of the United Nations' Second Asia-Pacific Forestry Sector Outlook Study 2020 emphasized the economic prospects of the region's forests for both present and future development (FAO, 2011). Numerous rare and exotic species call these vast and varied tropical woods home, creating unique opportunities for ecotourism and environmental education (Aihara et al., 2016; Ansori, 2021; Richards & Friess, 2016; Sarira et al., 2022). By creating jobs and improving infrastructure, forest tourism has the potential to significantly benefit the

local economy and society (Edwin et al., 2017; Ernawati, Voda, et al., 2018; Kuvan & Akan, 2012; Raihan, 2023). It can also support sustainable development, which will help to protect the environment and conserve species. However, these possibilities also present difficulties (Kuvan & Akan, 2012; Pratiwi & Juerges, 2022; Yasmi, 2003). Understanding how to balance the use and conservation of natural resources is essential for the growth of sustainable forest tourism in Southeast Asia. Additionally, poor tourism management can harm the environment and nearby populations. As a result, the goal of this research is to shed light on Southeast Asia's growing sustainable forest tourism industry (Aihara et al., 2016; Ansori, 2021; Richards & Friess, 2016).

The objective of this study is to carry out a bibliometric analysis of academic works that are devoted to Southeast Asian forest tourism. This study specifically aims to respond to the following queries: What is the primary research focus in Southeast Asia's forest tourism industry? Who are the organizations and most productive researchers in this sector? How has the study's subject changed over time? Finally, what are the trends in author-institutional collaboration? This study is significant because it offers a thorough overview of Southeast Asian forest tourism research, sheds light on areas that have and have not been studied, and reveals patterns of research collaboration and trends. As a result, the findings of this study can be utilized to plan future research as well as to design policies and strategies for the growth of sustainable forest tourism. Additionally, this research may help to protect Southeast Asia's forests and biodiversity, which would be a significant contribution in the age of climate change and declining biodiversity worldwide.

2. RESEARCH METHOD

In order to examine patterns and trends in a group of scientific publications, this research used a bibliometric analysis methodology, which employs mathematical and statistical methods (Khan et al., 2003). This bibliometric analysis is intended to measure and evaluate the production of research and its effects in a specific context, in this instance forest tourism in Southeast Asia. This study aids in understanding how this field of study has changed over time, as well as the subjects that have received the most attention from researchers and the institutions that have produced the most research (Aria & Cuccurullo, 2017).

The primary source of research information is the Scopus database, which is acknowledged globally as one of the most complete sources for knowledge about academic research, containing abstracts and references from different fields (Pranckutė, 2021). The databases featured in Scopus are chosen based on their ability to offer document screening capabilities using keywords and various types of filtering. Additionally, these databases are selected because they support the necessary data formats (.csv and .bib) for processing in Bibliometrix tools and popular used in previous studies with Bibliometric method (see: (Ejaz et al., 2022; Musa & Musa, 2022; Pedraja-Rejas et al., 2021; Tsilika, 2023)). Various keyword combinations are employed during the data search process:

TITLE-ABS-KEY (forest OR forestry AND tourism OR touristry) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (AFFILCOUNTRY, "Indonesia") OR LIMIT-TO (AFFILCOUNTRY, "Malaysia") OR LIMIT-TO (AFFILCOUNTRY, "Thailand") OR LIMIT-TO (AFFILCOUNTRY, "Viet Nam") OR LIMIT-TO (AFFILCOUNTRY, "Philippines") OR LIMIT-TO (AFFILCOUNTRY, "Singapore") OR LIMIT-TO (AFFILCOUNTRY, "Brunei Darussalam") OR LIMIT-TO (AFFILCOUNTRY, "Cambodia")).

Through these careful search criteria, a total of 309 articles were found and collected for further analysis. Myanmar, Laos and Timor Leste were not included in this study because there were no publications identified from these countries. Following Franco et al.'s (2022) approach, 309 documents underwent a rigorous screening procedure, wherein only scientific articles that had been published and were written in English were included. We conducted a screening process where we manually reviewed the titles and abstracts of the documents to determine their relevance. We only included publications that specifically addressed the subject of forest tourism in Southeast Asia. The publications not meeting the criteria were excluded. A total of 174 documents were obtained for further analysis using Bibliometrix tools.

Data processing and analysis was performed using the Bibliometrix package in the R programming environment (Aria & Cuccurullo, 2017). Bibliometrics is a powerful analytical tool that offers a suite of functions for performing descriptive analysis, collaborative analysis (such as author and keyword networks), and graphical visualization of data (Aria & Cuccurullo, 2017). This tool enables users to efficiently evaluate and understand the complexity of bibliometric data. After the data analysis process is complete, the results are placed in various forms of data visualization to facilitate interpretation (Aria & Cuccurullo, 2017). This visualization includes various graphical forms, including bar graphs, and network charts, each of which presents information such as the distribution of publications over time, the distribution of authors and institutions that contribute to the field, and the relationships between keywords and topics in the data. In addition to highlighting the productivity and significance of research, this analytic and visualization method sheds light on patterns of interaction and collaboration across authors, institutions, and countries. Additionally, this procedure offers a thorough grasp of the development and evolution of Southeast Asian forest tourism study issues.

3. FINDINGS

3.1 Main information

Table 1 comprises the study's analyzed data. This study provides an analysis of research documents published on the topic of tourism in Southeast Asia from 1993 to 2023. During this time period, 174 documents were extracted from 111 journals. This analysis demonstrates that research publications have increased by 11,47% per year, with a median age of 4,75 years. In addition, these documents received an average of 6,23 references per document for a total of 6975 citations.

Table 1. Main information

Description	Results
Timespan	1993:2023
Sources (Journals, Books, etc)	111
Documents	174
Annual Growth Rate %	11,47
Document Average Age	4,75
Average citations per doc	6,23
References	6975
DOCUMENT CONTENTS	
Keywords Plus (ID)	610
Author's Keywords (DE)	596
AUTHORS	
Authors	617

Description	Results
Authors of single-authored docs	14
AUTHORS COLLABORATION	
Single-authored docs	14
Co-Authors per Doc	4,01
International co-authorships %	17,82
DOCUMENT TYPES	
article	174

Utilizing 610 keyword plus (terms automatically generated from the titles of cited references (Aria & Cuccurullo, 2017)) and 596 author keywords (DE), research documents were analyzed. In the context of author collaboration, only 14 of the 617 contributing authors are the document's solitary authors. Additionally, 14 of the total documents were found to be written by a single author. Each document has an average of four co-authors, with 17,82 percent involving international collaborations. Each of the 174 documents become the main data of our analysis.

3.2 Most relevant authors

Several authors play significant roles in their contributions, as shown in Table 2. Authorship data on Southeast Asian forest tourism research's Most Relevant Authors shows the field's prolific contributors and their impact. Ismail SM and Siwar C are leading authors with five articles each, contributing significantly to forest tourism literature in the region. Their 1,15 fractionalized article counts indicate that they are prolific and influential in the field. With five, four, and three articles, Bhuiyan MAH, Shuib A, and Aziz A also stand out. Bhuiyan MAH's fractionalized article count of 0,75 indicates a significant contribution.

Table 2. Most relevant authors

Authors	Country	Articles	Articles Fractionalized
ISMAIL SM	Malaysia	5	1,15
SIWAR C	Malaysia	5	1,15
BHUIYAN MAH	Bangladesh	5	0,75
SHUIB A	Malaysia	4	1,03
AZIZ A	Malaysia	3	0,6
ISLAM R	Malaysia	3	0,65
RAMLAN MA	Malaysia	3	0,6
UTAMA IGBR	Indonesia	3	0,7
WAIYASUSRI K	Thailand	3	2

Findings show how Ismail and Bhuiyan continuously discuss the potential of sustainable ecotourism in Terengganu, Malaysia for 5 years from various perspectives starting from explored the issues and strategies, tourist perceptions through, and perception of local communities (Bhuiyan et al., 2012; 2013; 2011; 2014, 2015). Others, Shuib A's 1,03 indicates especially impactful work. Aziz A's fractionalized count of 0.6 also indicates emergent forest tourism research topics in Southeast Asia. Each of Islam R, Ramlan MA, Utama IGBR, and Waiyasusri K's three articles also help to shape the literature. Their individual field impact is shown by fractionalized counts from 0,56 to 2. Waiyasusri K has a fractionalized count of 2, indicating a significant impact on collaboration and co-authorship. This suggests that Waiyasusri K contributes significantly and collaborates to improve research impact.

3.3 Author local impact

Table 3 presents the local impact assessments of various authors, which refer to citations received from articles published within the same journal or source as the authors' own publications. This metric highlights the influence of authors within the specific journal or source where their work appears, as opposed to global impact, which measures citations from articles published in other journals or sources (Aria & Cuccurullo, 2017). Shuib A's literary contributions are very constant and significant, as evidenced by his g-index of 4. The mean h-index of co-authors corresponds to an m-index value of 0,308, suggesting a high level of collaborative research. Here, Shuib examines the economic potential of tourist parks in many forest tourism locations, including Kilim Karst Geoforest Park, Perlis State Park, and Matang Mangrove Forest Reserve (MMFR) (Matthew et al., 2019; Razak et al., 2018; Syamsul Herman et al., 2012).

Table 3. Author local impact

Element	h_index	g_index	m_index	TC	NP	PY_start
SHUIB A	4	4	0,308	40	4	2012
BHUIYAN MAH	2	3	0,143	24	3	2011
CHUNKAO K	2	2	0,167	15	2	2013
HARIANTO SP	2	2	0,4	10	2	2020
HASHIM M	2	2	0,222	31	2	2016
HOSAKA T	2	2	0,222	31	2	2016
INKAPATANAKUL W	2	2	0,167	15	2	2013
ISLAM R	2	3	0,143	27	3	2011
ISMAIL SM	2	5	0,143	31	5	2011

Bhuiyan MAH possesses a notable but not extensive field presence, as evidenced by an h-index of 2. The presence of a cooperative network that enhances the effect of research is seen in the g-index of 3 and m-index of 0,143, which suggest a modest level of influence. Islam R has achieved an h-index of 2 and a g-index of 3, indicating a substantial body of scholarly work. Ismail SM's h-index of 2 and g-index of 5 demonstrate his significance in the field of Southeast Asian forest tourism research. The publishing years (PY_start) indicate the commencement of an author's contributions in their area. Since 2011 or before, the literature has continuously included the works of Shuib A, Bhuiyan MAH, and Ismail SM.

3.4 Most relevant affiliations

The affiliations or institutions highlighted in Table 4 are the most germane to this field of study. In this instance, Universiti Putra Malaysia has contributed 42 articles, and Universiti Kebangsaan Malaysia contributed 24 articles. An exemplary study conducted by Fallah & Ocampo (2021) from Universiti Putra Malaysia focuses on the development of criteria and indicators (C&I) for assessing the sustainability of ecotourism operations in Penang National Park (PNP) in Malaysia.

Table 4. Most relevant affiliations

Affiliation	Articles
UNIVERSITI PUTRA MALAYSIA	42
UNIVERSITAS INDONESIA	24
UNIVERSITI KEBANGSAAN MALAYSIA	24
UNIVERSITAS LAMPUNG	21
KASETSART UNIVERSITY	18
MAHIDOL UNIVERSITY	13
UNIVERSITI TEKNOLOGI MARA	13

Affiliation	Articles
CHIANG MAI UNIVERSITY	11
CHULALONGKORN UNIVERSITY	11

In Indonesia, Universitas Indonesia and Universitas Lampung contributed 24 and 21 articles, respectively. In addition, Kasetsart University from Thailand contributed 13 articles that were deemed significant. Other notable contributors include the Mahidol University and Universiti Teknologi Mara, with each them contributing 13 articles. Furthermore, Chiang Mai University and Chulalongkorn University each made a contribution of 11 publications.

3.5 Affiliations' production over Time

Figure 1 depicts the productivity tendencies of agencies and affiliates over time. For instance, Universiti Putra Malaysia began contributing in 2008, with the highest increase being in 2013, and until 2023, there were 16 documents affiliated at this university. This demonstrates the institution's growing focus and interest in forest tourism. Another affiliated author from Chiang Mai University began research in 2009 by looking at conservation and ecotourism potential along the Mekong River, Kratie and Steung Treng Provinces, Cambodia (Maxwell, 2009). Universiti Kebangsaan Malaysia started research on this topic in 2011 and to date there are 8 documents.

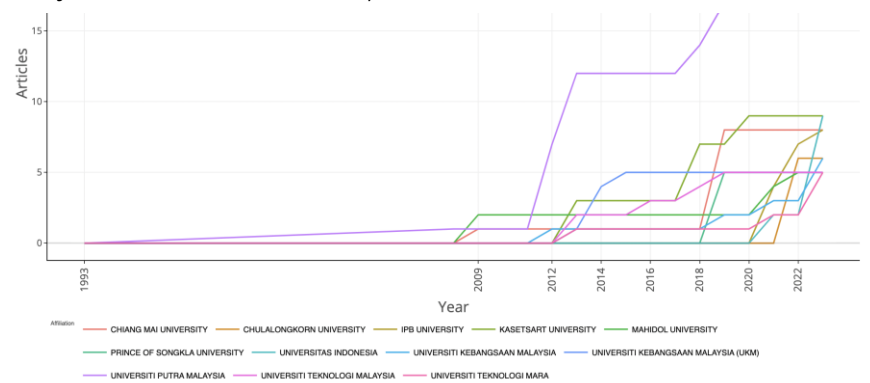


Figure 1. Affiliations' Production over Time

Meanwhile, the author from Kasetsart University began contributing in 2013 by taking a case study approach in Thailand (Nuranca et al., 2013; Pukkalnun et al., 2013). The most recent scholarly discussion by writers affiliated with this institution revolves about the primary factors contributing to fatal drownings in Chamang Forest Eco Park related to environmental hazards and risks associated with tourism. Also, the perception was that high visitor numbers significantly influenced the management of drowning safety (Abidin et al., 2023).

3.6 Most relevant sources

Table 5 contains an evaluation of the most pertinent sources in this discipline. Biodiversitas and the Journal of Environmental Management and Tourism are the primary sources, with each publishing 10 articles. These publications serve as prominent resources for academics and researchers as they feature research on forest tourism in Southeast Asia.

Table 5. Most relevant sources

Sources	Articles
Biodiversitas	10
Journal of Environmental Management and Tourism	10
Malaysian Forester	9
African Journal of Hospitality, Tourism and Leisure	6
Geojournal of Tourism and Geosites	6
Journal of Tropical Forest Science	4
Jurnal Manajemen Hutan Tropika	4
International Journal of Sustainable Development and Planning	3
Journal of Ecotourism	3
Journal of Sustainability Science and Management	3
Jurnal Pengelolaan Sumberdaya Alam dan Lingkungan	3

One notable research article in Biodiversitas conducted by Harianto et al. (2020) described the management conditions and potential of operational tourist Attraction Objects (TAO) and visitor and local community viewpoints. The feasibility of developing TAO was determined. Tourists express satisfaction with the attractions and management. It also described public perception of ongoing administration. The community wants continual progress. In response, researchers recommend modifying management and marketing techniques in order to attract both domestic and international tourists to Lampung's Liwa Botanical Gardens (LBG).

The Malaysian Forester is also increasingly pertinent for forest tourism research, particularly in Malaysia, with a total of nine publications. The African Journal Of Hospitality, Tourism And Leisure and Geojournal Of Tourism And Geosites both include six papers, highlighting their significance in disseminating research. Other mentioned journals are Journal of Tropical Forest Science, Jurnal Manajemen Hutan Tropika, International Journal of Sustainable Development and Planning, Journal of Ecotourism, Journal of Sustainability Science and Management, and Jurnal Pengelolaan Sumberdaya Alam dan Lingkungan. Each journal produced a minimum of three to four papers. Despite publishing fewer articles, these publications also play a significant role in shaping the ongoing discourse on forest tourism in Southeast Asia.

3.7 Source Local Impact

Evaluations of the local impacts of the sources that contributed to the research literature are provided in Table 6. With an h-index of 4, the Journal of Environmental Management and Tourism has a significant and consistent influence with a variety of highly referenced articles. A notable study from Journal of Environmental Management and Tourism contributed by Utama et al. (2021) sought key indicators of community involvement in ecotourism management to ensure that local communities uphold ecotourism values, minimize negative impacts, build awareness and appreciation of ecosystems and culture, provide positive opportunities for visitors and hosts, provide direct financial benefits for conservation, and empower local residents.

Table 6. Source Local Impact

Element	h_index	g_index	m_index	TC	NP	PY start
Journal of Environmental Management and Tourism	4	7	0,571	51	10	2018
Journal of Tropical Forest Science	4	4	0,333	54	4	2013
Biodiversitas	3	5	0,6	28	10	2020
Geojournal of Tourism and Geosites	3	6	0,375	36	6	2017
African Journal of Hospitality,	2	5	0,333	27	6	2019

Element	h_index	g_index	m_index	TC	NP	PY start
Tourism and Leisure						
Environment, Development and Sustainability	2	2	0,4	53	2	2020
International Journal of Business and Society	2	2	0,167	14	2	2013
Journal of Ecotourism	2	3	0,125	58	3	2009
Journal of Sustainability Science and Management	2	3	0,4	21	3	2020
Kasetsart Journal of Social Sciences	2	2	0,286	24	2	2018

The journal's g-index of 7 and m-index of 0,571 indicate its importance and collaboration, showing it is a major hub for Southeast Asian forest tourism research. With h-index 4, g-index 4, and m-index 0,333, the Journal of Tropical Forest Science has a strong impact. These indicators show that the journal publishes well-cited, field-advancing papers. Since 2020, Biodiversitas, with an h-index of 3, has had a significant influence. The journal's g-index of 5 and m-index of 0,6 suggests that forest tourism researchers have found it useful. With h-indices of 3 and 2, Geojournal of Tourism and Geosites and the African Journal of Hospitality, Tourism, and Leisure have a strong effect. These journals' g-indices of 6 and 5 indicate that they publish highly cited papers that contribute to knowledge. Environment, Development and Sustainability, International Journal of Business and Society, Journal of Ecotourism, Journal of Sustainability Science and Management, and Kasetsart Journal of Social Sciences have different influences on this area. These publications contribute to Southeast Asian forest tourism research despite their different h-indices. The source Local Impact data shows that some publications shape Southeast Asian forest tourism discourse. These periodicals are essential for field researchers and scholars to find influential and well-cited papers that progress knowledge.

3.8 Most global cited documents

Table 7 displays many documents that, based on the overall number of citations, have attracted a lot of interest. The publication "CA-Markov analysis of constrained coastal urban growth modeling: Hua hin Seaside City, Thailand" has the most citations (67). It discussed tourism-driven development in Hua Hin City. From forests to farmland, meadows to unoccupied land and built-up regions, land use has changed. Over a decade, coastal urban expansion has spread horizontally from urban centers to western golf course regions, southern coastal areas, southwestern prairie areas, and northern airport areas (Kityuttachai et al., 2013).

Table 7. Most global cited documents

Paper	Total Citations	TC per Year	Normalized TC
CA-Markov analysis of constrained coastal urban growth modeling: Hua hin Seaside City, Thailand (Kityuttachai et al., 2013)	67	5,58	5,34
The value of a mangrove area in Sarawak (Bennett & Reynolds, 1993)	60	1,88	1
Impact of tourism development on the local livelihoods and land cover change in the Northern Vietnamese highlands (Hoang et al., 2020)	39	7,8	4,51
Visitor satisfaction with a key wildlife tourism destination within the context of a damaged landscape	38	6,33	5,57

Paper	Total Citations	TC per Year	Normalized TC
(Newsome et al., 2019)			
Up in the clouds: Is sustainable use of tropical montane cloud forests possible in Malaysia? (Peh et al., 2011)	38	2,71	1,97
Twitter data sentiment analysis of tourism in Thailand during the COVID-19 pandemic using machine learning (Leelawat et al., 2022)	36	12	11,17
Knowledge, attitudes, and practices among foreign backpackers toward malaria risk in Southeast Asia (Piyaphanee et al., 2009)	36	2,25	1,69
Community-based transboundary ecotourism in the Heart of Borneo: A case study of the Kelabit Highlands of Malaysia and the Kerayan Highlands of Indonesia (Hitchner et al., 2009)	34	2,13	1,6
Marine bacterial communities in the upper gulf of Thailand assessed by Illumina next-generation sequencing platform (Nimnoi & Pongsilp, 2020)	27	13,5	16,33
Dynamic Linkages between Environmental Factors and Carbon Emissions in Thailand (Raihan et al., 2023)	27	5,4	3,12

Following closely is "The significance of a mangrove region in Sarawak," with 60 citations. The last one on the most cited document is contributed by Raihan et al. (2023) who examined how economic development, renewable energy consumption, urbanization, industrialization, tourism, agricultural productivity, and forest areas affect CO2 emissions in Thailand.

3.9 Trend topics

Figure 2 demonstrates some of the key themes and trends that the bibliometric analysis revealed. Between 2018 and 2022, there was a substantial rise in the amount of research conducted on ecotourism. There is a growing fascination with ecotourism in the forests of Southeast Asia. The research specifically concentrating on forest tourism has taken place in Malaysia and Indonesia.

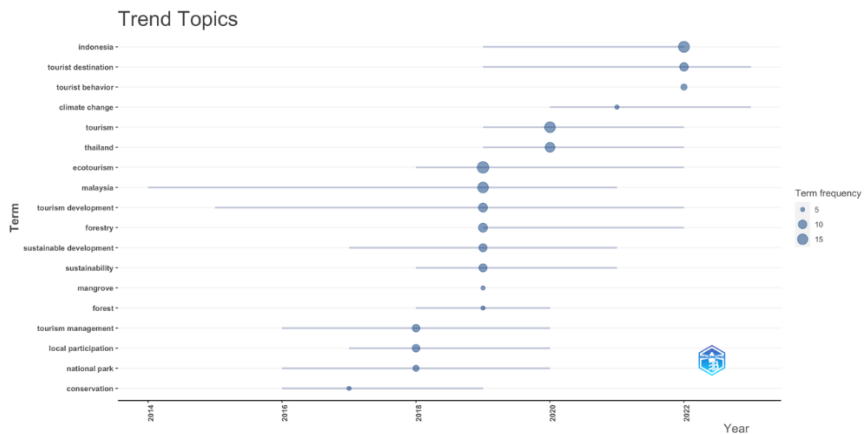


Figure 2. Trend Topics

From 2017 to 2020, there is consistent focus on including the local community and effectively managing tourism. The prioritization of local community engagement in the creation and management of forest tourism demonstrates a broader

commitment to sustainable and community-centric endeavors. Some notable research in this period discussed the potential of forest tourism in empowering locals in Indonesian forests (Edwin et al., 2017; Hukmiah, 2020; Utami et al., 2020).

The period from 2015 to 2022 has seen a sustained focus on analyzing the growth of tourism and its impact on forests in Southeast Asia, indicating a persistent interest in tourist development. The forest tourism study focuses on environmental and conservation concerns, specifically in relation to national parks, sustainability, and sustainable development. Thailand, Malaysia, and Indonesia's prominent tourist spots are showcased. This recognizes the significant role that these countries play in the field of forest tourism in Southeast Asia.

Since 2020, climate change has garnered significant attention in the realm of forest tourism due to its profound environmental effects. Although not explicitly mentioned, there is a clear emphasis on mangroves as habitats in 2019. The issue of mangrove ecotourism gained attention by various countries and perspectives. In Indonesia, Hasib et al. (2020) discussed these issues from a religion approach of local community potential development, meanwhile Ardiansyah et al. (2019) explored the conservation and economic value in mangrove forests. Others on this issue also examined similar dimensions in Malaysia (Latiff, 2019) and Thailand (Treephan & Visuthismajarn, 2019). These findings indicate that Southeast Asian forest tourism is increasingly prioritizing ecotourism, local involvement, and addressing climate change. The persistent emphasis on certain countries and subjects demonstrates the ongoing development and dedication of this field to examining and addressing issues and prospects related to forest tourism in the region.

3.10 Thematic evolution

Figure 3 demonstrates a change in emphasis and the development of several key ideas throughout time. From 1993 until 2012, the primary emphasis was on the concept of "ecotourism". The first study in this topic was carried out by Bennett & Reynolds (1993) who discussed the debate on mangrove forest conservation in the Sarawak Mangrove Forest Reserve, Malaysia. This indicates that in the initial phases, scholars in the field were predominantly focused on the concept of ecotourism and its implications for forest tourism in Southeast Asia. From 2013 to 2020, there has been a notable rise in keywords, suggesting a broadening of focus in research. The inclusion of terminology such as "Thailand," "mangrove forest," "tourism," "sustainable tourism," "environment," "ecotourism," and "contingent valuation method" implies a comprehensive analysis of several aspects of forest tourism.

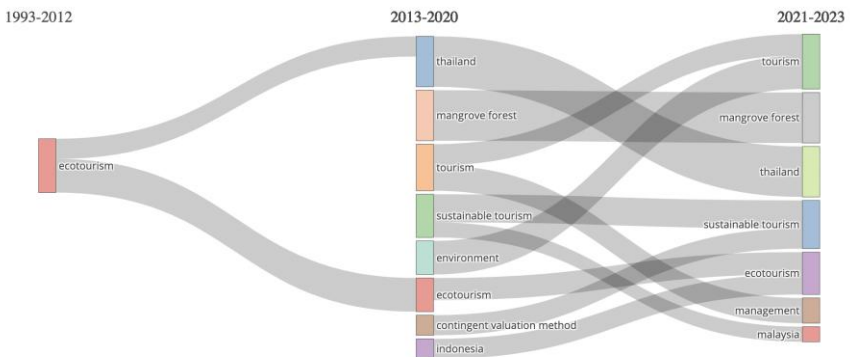


Figure 3. Thematic evolution

The presence of particular countries like Thailand and Indonesia implies a transition towards study that is more tailored to the specific circumstances of those countries. Furthermore, the utilization of phrases such as "sustainable tourism" and "environment" signifies an enhanced recognition of the wider environmental and sustainability concerns within this area. During the period from 2021 to 2023, thematic keywords that have gained prominence include "tourism," "mangrove forest," "Thailand," "sustainable tourism," "ecotourism," "management," and "Malaysia." This demonstrates a persistent commitment to sustainable and ecotourism practices, with a specific focus on the administrative aspects of forest tourism. The inclusion of Malaysia, in addition to Thailand, exemplifies a broadening of regional perspectives.

3.11 Collaboration worldmap

A comparison of international research partnerships is shown in Figure 4. This analysis illustrates the wide-ranging international network of research collaborations in forest tourism, which highlights the significance of this topic on a global scale. Indonesia demonstrates exceptional proficiency in establishing and maintaining tripartite alliances with Germany and the US. The relationship between Indonesia and Germany may involve the sharing of expertise across continents, perhaps expanding the viewpoint of forest tourism. An interesting research collaboration in this field explores the Indonesian government's choice to market protected areas (PAs) and aggressively promote tourism, and how government organizations and structures may achieve this from a political ecology approach (Purnomo et al., 2022). This area of engagement reveals that Indonesian protected area commercialization causes impasse, monopoly, management, and environmental degradation.

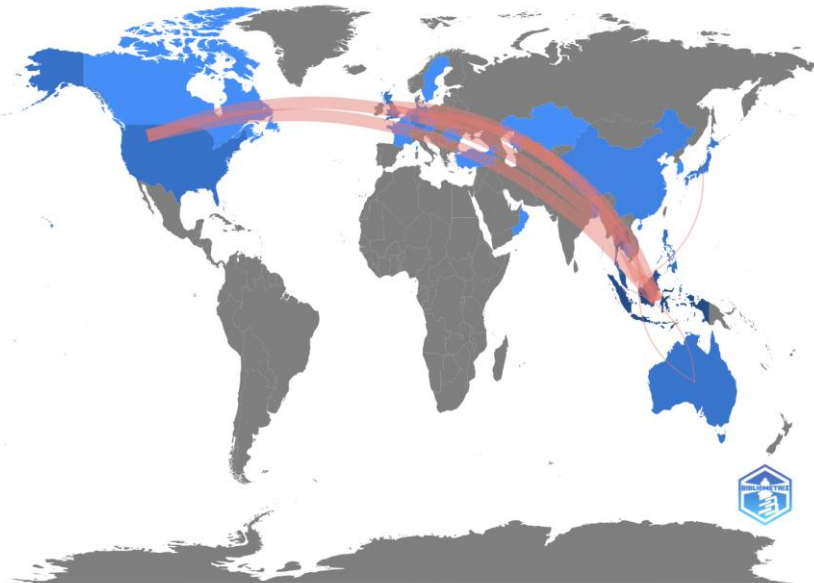


Figure 4. Collaboration WorldMap

Malaysia has formed trilateral ties with the United Kingdom and Australia. This transcontinental collaboration demonstrates a deliberate effort to incorporate diverse perspectives and expertise in forest tourism research. The collaboration among Malaysia, Bangladesh, and Japan implies establishment of an extensive research

network in Asia. Otherwise, Thailand's research relationships with the US stands out in global research networks.

3.12 Sub-topic clustering

Keyword analysis was conducted to address the first study question on the main research emphasis in the forest tourism sector in Southeast Asia. To address the first study question on Southeast Asia's forest tourism industry, keyword analysis was conducted. This study maps two subtopics that are extensively addressed in Southeast Asian forest tourism. First, in the blue node group we identified Malaysia, forestry, carbon dioxide, and Indonesia, and with national parks emphasizing conservation. Several research articles in this category begin with Aihara et al.'s article (2016) on wildlife tourism. These findings suggest that mammalian wildlife-based tourism venues should have animal indicators and instruments for indirect observation of uncommon and elusive creatures. Wildlife visitors are drawn to Asian elephants, but local communities and elephants may clash. A satisfaction survey by Newsome et al. (2019) addressed this issue. Wildlife tourism is developing worldwide, and visitor satisfaction is crucial for sustainability. Major wildlife tourist destinations in the Lower Kinabatangan River are impacted by neighboring land use and require careful management to maintain pleasant wildlife tourism experiences. Ernawati, Torpan, et al. (2018) explore tropical and subtropical forest pathways to Mesehe and Pisiou Waterfalls to enhance sustainable tourism in the Pohsanten Community, Bali, Indonesia, and Bistra, Romania. This paper finds that tourism may solve environmental damage and assist rural populations, enabling sustainable tourist growth in Pohsanten and Bistra. Others, keyword such as carbon dioxide contributed by Binarti et al. (2022) predict the effectiveness of three mitigation strategies to increase comfort of visitor areas at the Prambanan Temple Tourism Park, which were developed in previous research. Elements included cooling effect of the park around the visitor area, cool transparent layers on rock temples, and placement of groups of potted trees (green umbrellas) based on comfortable walking. The proposed garden lowers temperature in three simulations.

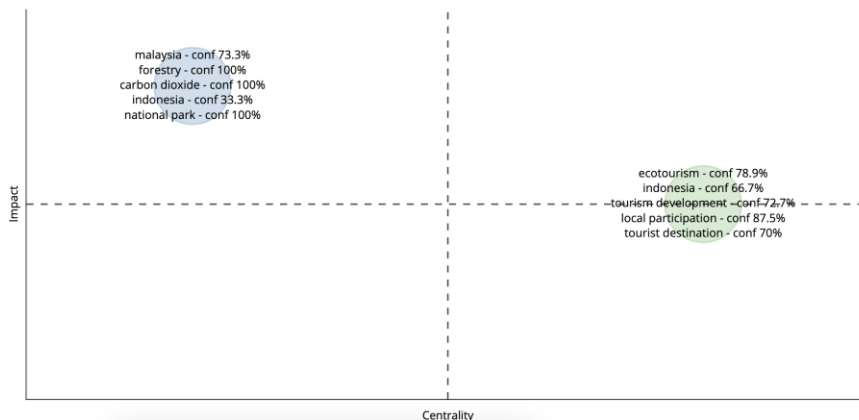


Figure 5. Topic Clustering.

The second green node category includes ecotourism, Indonesia, tourism development, local engagement, and tourist destination. Research that has benefited this group generally addresses ecotourism's potential. (Hitchner et al., 2009) assessed community-based transboundary ecotourism in the Kelabit Highlands in Sarawak, Malaysia, and the Kerayan Highlands in Kalimantan, Indonesia, sites of the worldwide

conservation program 'Heart of Borneo'. Mohd Shahwahid et al. (2013) examined the extent to which community based ecotourism has been practiced in Malaysia, using the Kampung Kuantan (FP) Firefly Park, a habitat for Lampyridae beetles, to evaluate the park's services and service providers' abilities to meet tourist demand using community-based criteria. Others, such as Hakim & Soemarno (2017) assessed biodiversity in the Bromo-Tengger-Semeru-Arjuno Biosphere Reserve, describing local communities and factors that cause biodiversity loss. According to their findings, they also made normative geotourism development recommendations. Pookhao Sonjai et al. (2018) use ethnographic methods to examine the Khiriwong community, Thailand's first community-based ecotourism initiative that began in 1996. Because community-based ecotourism emphasizes community engagement, cohesiveness, forest conservation, self-reliance, and sustainability, which are romantic ideals, the community gets connected with identification, subject, and identity. It also highlighted issues of national policy and stakeholder expectations, as well as the implications of commodifying faked authenticity.

4. DISCUSSION

The results of this bibliometric study revealed that primary research in Southeast Asia is heavily focused on conservation and ecotourism. This is demonstrated by the interpretation of results on theme development and topic grouping. Conservation and tourism have overlapped and converged since at least the early 1900s. However, we found there is a distinction between the two, since ecotourism is both an extension and refinement of the relationship between tourism and conservation (Stronza et al., 2019). Conservation is the protection, maintenance, sustainable use, restoration, and enhancement of the natural environment. Living resource conservation focuses on plants, animals, and microorganisms, as well as the non-living parts of their environments (Fund, 1980). Meanwhile, ecotourism is a type of tourism that differs from nature tourism and outdoor leisure in that it focuses on conservation and development (Stronza et al., 2019). In conservation, for example, Matthew et al. (2019) proposed a trip cost adjustment method for environmental conservation rather than a consumer surplus adjustment technique. Their study on the monetary value of geoforest parks aimed to increase awareness of the need to maintain the Kilim Karst Geoforest Park, a specific conservation area inside the Permanent Forest Reserve. Meanwhile, Purwoko et al. (2023) investigated the potential of tourist attractions, development feasibility, visitor satisfaction, service and infrastructure conditions, and visitor participation in conservation and the environment at Sipinsur Nature Tourism. Others (e.g., Mihardja et al., 2023) investigated the possibility of branding the Batur Geopark destination as a mental leisure location with the subject "forest bathing". The development of forest bathing as a branding strategy is also an attempt to protect forests and maximize local community involvement. There is potential for destination branding using a Geoforest-Bathing type motif.

This study also explains how various researchers working on this issue are consistently productive in recognizing the potential of forest tourism (Bhuiyan et al., 2012; 2013; 2011; 2014, 2015). In addition, Journals such as *Biodiversitas*, the *Journal of Environmental Management and Tourism*, and *Malaysian Forester*, have all made valuable contributions to this field. Previous studies have also provided detailed information on author affiliation and collaboration between countries. Forest tourism has sparked interest among scholars studying the region from countries other than Southeast Asia, including the United States, United Kingdom, Germany, and others. Finally, this study demonstrated how the growth of research on the topic of forest

tourism has gotten a lot of attention, particularly given the relevance of sustainability problems.

5. CONCLUSION

The analysis shows a large increase in forest tourism-related research in Southeast Asia between 1993 and 2023. The number of publications grew by 11,74% annually, with the majority of authors from Malaysia. Leading academic institutions in this discipline include universities in Malaysia, Indonesia and Thailand, with the journal *Biodiversitas* serving as the principal reference. The research question that was posed at the beginning of this study for the purpose of determining what subtopics are developing on the issue of forest tourism has been discussed in detail throughout this study. Over the course of the past three decades, numerous researchers in Southeast Asia have come to place a significant emphasis on conservation and ecotourism as their primary research concerns.

This study excludes other sorts of publications including conference reports, theses, and novels and only concentrates on articles that have been published in scholarly journals. Additionally, this analysis excludes potentially pertinent research from other regions and exclusively includes research done in Southeast Asia. Going forward, we propose a more thorough study on the methodologies and content of the articles in this research, and future ones that build on them. This will help to clarify the key theories and conclusions of the most significant studies on forest tourism. To acquire a wider global perspective, future studies may also take into account research on forest tourism in other regions. To acquire a more complete picture of this field of study, it is helpful to include a variety of publications in the analysis.

Author contributions: ADS: Conceptualization, Methodology, Data Collection, Data Analysis, Writing (draft preparation, reviewing, and editing); SS: Methodology, Data Analysis, Writing (addressing reviewer comments, reviewing, and editing); YY: Writing (reviewing and editing).

Competing Interests: The authors declare no conflict of interest

Acknowledgments: The author wishes to express his sincere thanks to the Editors and Reviewers, who, with their expertise and dedication, have provided invaluable guidance and feedback in the process of writing this paper. Their constructive criticism and suggestions have helped improve the quality of this research significantly.

REFERENCES

- Abidin, Z. A. Z., Kelana, S. R., Ramlan, M. A., Jumaat, N. J., & Aziz, A. (2023). Drowning Risk Assessment at A Nature-Based Tourism Destination In Malaysia: A Case Study Of Chamang Forest-Eco Park. *Malaysian Forester*, 86(2), 308 – 324.
- Aihara, Y., Hosaka, T., Yasuda, M., Hashim, M., & Numata, S. (2016). Mammalian Wildlife tourism in South-East Asian tropical rainforests: The case of Endau Rompin national Park, Malaysia. *Journal of Tropical Forest Science*, 28(2), 167 – 181.
- Anowar Hossain Bhuiyan, M., Azizul Bari, M., Siwar, C., Ismail, S. M., & Islam, R. (2012). Measurement of carbon dioxide emissions for eco-tourism in Malaysia. *Journal of Applied Sciences*, 12(17), 1832–1838. <https://doi.org/10.3923/jas.2012.1832.1838>
- Ansori, S. (2021). The politics of forest fires in southeast asia. *Contemporary Southeast Asia*, 43(1). <https://doi.org/10.1355/cs43-1p>
- Ardiansyah, M., Suharno, & Susilowati, I. (2019). Estimating the conservation value of

- mangrove forests in marine protected areas: Special reference to karimunjawa waters, Indonesia. *AAFL Bioflux*, 12(2), 437 – 447.
- Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959–975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Bennett, E. L., & Reynolds, C. J. (1993). The value of a mangrove area in Sarawak. *Biodiversity and Conservation*, 2(4), 359–375. <https://doi.org/10.1007/BF00114040>
- Bhuiyan, A. H., Bari, A., Siwar, C., Ismail, S. M., & Islam, R. (2013). Measurement of carbon di-oxide emissions for ecotourism in Malaysia. *Middle East Journal of Scientific Research*, 13(9), 1224 – 1229. <https://doi.org/10.5829/idosi.mejsr.2013.13.9.962>
- Bhuiyan, M. A. H., Siwar, C., Ismail, S. M., & Islam, R. (2011). Ecotourism development in recreational forest areas. *American Journal of Applied Sciences*, 8(11), 1116 – 1121. <https://doi.org/10.3844/ajassp.2011.1116.1121>
- Bhuiyan, Md. A. H., Siwar, C., Ismail, S. M., & Aman, A. (2014). Tourists' perception on local economy of Terengganu state in Malaysia. *Journal of Food, Agriculture and Environment*, 12(3–4), 345 – 348.
- Bhuiyan, Md. A. H., Siwar, C., Ismail, S. M., & Komoo, I. (2015). Sustainable ecotourism development in Sekayu Recreational Forest and Lake Kenyir in Terengganu, Malaysia. *Malaysian Forester*, 78(1–2), 33 – 40.
- Binarti, F., Koerniawan, M. D., Triyadi, S., & Matzarakis, A. (2022). The predicted effectiveness of thermal condition mitigation strategies for a climate-resilient archaeological park. *Sustainable Cities and Society*, 76. <https://doi.org/10.1016/j.scs.2021.103457>
- Cheng, M., Wong, I. A., Wearing, S., & McDonald, M. (2017). Ecotourism social media initiatives in China. *Journal of Sustainable Tourism*, 25(3), 416–432. <https://doi.org/10.1080/09669582.2016.1214141>
- Edwin, M., Sulistyorini, I. S., & Allo, J. K. (2017). Assessment of natural resources and local community participation in nature-based tourism of Wehea Forest, East Kalimantan. *Jurnal Manajemen Hutan Tropika*, 23(3), 128–139. <https://doi.org/10.7226/jtfm.23.3.128>
- Ejaz, H., Zeeshan, H. M., Ahmad, F., Bukhari, S. N. A., Anwar, N., Alanazi, A., ... & Younas, S. (2022). Bibliometric Analysis of Publications on the Omicron Variant from 2020 to 2022 in the Scopus Database Using R and VOSviewer. *International Journal of Environmental Research and Public Health*, 19(19). <https://doi.org/10.3390/ijerph191912407>
- Ernawati, N. M., Torpan, A., & Voda, M. (2018). Geomedia role for mountain routes development. Mesehe and pisiou waterfall comparative study. *Geographia Technica*, 13(1), 41 – 51. https://doi.org/10.21163/GT_2018.131.05
- Ernawati, N. M., Voda, M., Sudhana, I. G. P. F. P., & Sudarmini, N. M. (2018). Forest environment supports for community-based tourism development. *Journal of Environmental Management and Tourism*, 9(8), 1635–1641. [https://doi.org/10.14505/jemt.v9.8\(32\).01](https://doi.org/10.14505/jemt.v9.8(32).01)
- Fallah, M., & Ocampo, L. (2021). The use of the Delphi method with non-parametric analysis for identifying sustainability criteria and indicators in evaluating ecotourism management: the case of Penang National Park (Malaysia). *Environment Systems and Decisions*, 41(1), 45 – 62. <https://doi.org/10.1007/s10669-020-09790-z>
- FAO. (2010). Asia-Pacific Forests and Forestry to 2020. In *Second Asia-Pacific Forestry*

- sector Outlook Study*. FAO.
- FAO. (2011). *Southeast Asia Subregional Report: Subregional Report of The Second Asia-Pacific Forestry Sector Outlook Study*. FAO.
- Franco, P., Segelov, E., Johnsson, A., Riechelmann, R., Guren, M. G., Das, P., ... & De Felice, F. (2022). A Machine-Learning-Based Bibliometric Analysis of the Scientific Literature on Anal Cancer. *Cancers*, 14(7). <https://doi.org/10.3390/cancers14071697>
- Friess, D. A. (2017). Ecotourism as a tool for mangrove conservation. *Sumatra Journal of Disaster, Geography and Geography Education*, 1(1), 24–35.
- Fund, W. W. (1980). *World conservation strategy: Living resource conservation for sustainable development* (Vol. 1). IUCN.
- Hakim, L., & Soemarno, M. (2017). Biodiversity conservation, community development and geotourism development in Bromo-Tengger-Semeru-Arjuno biosphere reserve, East Java. *Geojournal of Tourism and Geosites*, 20(2), 220 – 230.
- Hariato, S. P., Masruri, N. W., Winarno, G. D., Tsani, M. K., & Santoso, P. J. T. (2020). Development strategy for ecotourism management based on feasibility analysis of tourist attraction objects and perception of visitors and local communities. *Biodiversitas*, 21(2), 689 – 698. <https://doi.org/10.13057/biodiv/d210235>
- Hasib, F. F., Nurdiansyah, A. D. B., & Setiawan, Y. R. (2020). The impact of mangrove ecotourism on welfare from the perspective of Maqasid al-Sharia. *International Journal of Innovation, Creativity and Change*, 10(12), 502 – 512.
- Hitchner, S. L., Apu, F. L., Tarawe, L., Aran, S. N., & Yesaya, E. (2009). Community-based transboundary ecotourism in the Heart of Borneo: A case study of the Kelabit Highlands of Malaysia and the Kerayan Highlands of Indonesia. *Journal of Ecotourism*, 8(2), 193 – 213. <https://doi.org/10.1080/14724040802696064>
- Hoang, T. T. H., Van Rompaey, A., Meyfroidt, P., Govers, G., Vu, K. C., Nguyen, A. T., Hens, L., & Vanacker, V. (2020). Impact of tourism development on the local livelihoods and land cover change in the Northern Vietnamese highlands. *Environment, Development and Sustainability*, 22(2), 1371 – 1395. <https://doi.org/10.1007/s10668-018-0253-5>
- Hukmiah. (2020). Community economic empowerment the bajo tribe is based on local potential (A case study in Bajoe village, east tanete riattang sub-district bone). *International Journal of Scientific and Technology Research*, 9(4), 3327 – 3331.
- Kanniah, K. D., Sheikhi, A., Cracknell, A. P., Goh, H. C., Tan, K. P., Ho, C. S., & Rasli, F. N. (2015). Satellite images for monitoring mangrove cover changes in a fast growing economic region in southern Peninsular Malaysia. *Remote Sensing*, 7(11), 14360–14385. <https://doi.org/10.3390/rs71114360>
- Khan, K. S., Kunz, R., Kleijnen, J., & Antes, G. (2003). Five steps to conducting a systematic review. *Journal of the Royal Society of Medicine*, 96(3), 118–121. <https://doi.org/10.1258/jrsm.96.3.118>
- Kityuttachai, K., Tripathi, N. K., Tipdecho, T., & Shrestha, R. (2013). CA-Markov analysis of constrained coastal urban growth modeling: Hua hin Seaside City, Thailand. *Sustainability (Switzerland)*, 5(4), 1480 – 1500. <https://doi.org/10.3390/su5041480>
- Kuvan, Y., & Akan, P. (2012). Conflict and agreement in stakeholder attitudes: Residents' and hotel managers' views of tourism impacts and forest-related tourism development. *Journal of Sustainable Tourism*, 20(4), 571–584. <https://doi.org/10.1080/09669582.2011.617824>
- Latiff, A. (2019). The physical landscape and biodiversity potential of Pulau Pangkor as an ecotourism destination. *Malaysian Forester*, 82(1), 1 – 10.

- Leelawat, N., Jariyapongpaiboon, S., Promjun, A., Boonyarak, S., Saengtattim, K., Laosunthara, A., Yudha, A. K., & Tang, J. (2022). Twitter data sentiment analysis of tourism in Thailand during the COVID-19 pandemic using machine learning. *Heliyon*, *8*(10). <https://doi.org/10.1016/j.heliyon.2022.e10894>
- Mandai Nature. (2020). *Conservation Promoting The Business Of Tourism In Southeast Asia*. Mandai Nature.
- Matthew, N. K., Shuib, A., Ramachandran, S., & Mohammad-Afandi, S. H. (2019). Economic valuation using travel cost method (TCM) in Kilim Karst Geoforest Park, Langkawi, Malaysia. *Journal of Tropical Forest Science*, *31*(1), 78 – 89. <https://doi.org/10.26525/jtfs2019.31.1.078089>
- Maxwell, J. F. (2009). Vegetation and vascular flora of the Mekong River, Kratie and Steung Treng Provinces, Cambodia. *Maejo International Journal of Science and Technology*, *3*(1), 143 – 211.
- Mihardja, E. J., Alisjahbana, S., Agustini, P. M., Sari, D. A. P., & Pardede, T. S. (2023). Forest wellness tourism destination branding for supporting disaster mitigation: A case of Batur UNESCO Global Geopark, Bali. *International Journal of Geoheritage and Parks*, *11*(1), 169 – 181. <https://doi.org/10.1016/j.ijgeop.2023.01.00>
- Mohd Shahwahid, H. O., Mohd Iqbal, M. N., Amira Mas Ayu, A. M., & Farah, M. S. (2013). Assessing service quality of community-based ecotourism: A case study from Kampung Kuantan Firefly Park. *Journal of Tropical Forest Science*, *25*(1), 22–33.
- Musa, H. H., & Musa, T. H. (2022). A systematic and thematic analysis of the top 100 cited articles on mRNA vaccine indexed in Scopus database. *Human Vaccines and Immunotherapeutics*, *18*(6). <https://doi.org/10.1080/21645515.2022.2135927>
- Newsome, D., Rodger, K., Pearce, J., & Chan, K. L. J. (2019). Visitor satisfaction with a key wildlife tourism destination within the context of a damaged landscape. *Current Issues in Tourism*, *22*(6), 729 – 746. <https://doi.org/10.1080/13683500.2017.1312685>
- Nimnoi, P., & Pongsilp, N. (2020). Marine bacterial communities in the upper gulf of Thailand assessed by Illumina next-generation sequencing platform. *BMC Microbiology*, *20*(1). <https://doi.org/10.1186/s12866-020-1701-6>
- Nuranca, P., Inkapatanakul, W., & Chunkao, K. (2013). Guidelines to the management of firefly watching tour in Thailand. *Modern Applied Science*, *7*(3), 8 – 14. <https://doi.org/10.5539/mas.v7n3p8>
- Pan, S., Chon, K., & Song, H. (2008). Visualizing tourism trends: A combination of ATLAS.ti and BiPlot. *Journal of Travel Research*, *46*(3), 339–348. <https://doi.org/10.1177/0047287507308318>
- Pedraja-Rejas, L., Rodríguez-Ponce, E., Bernasconi, A., & Muñoz-Fritis, C. (2021). Leadership in higher education institutions: An analysis through Bibliometrix R; [Liderazgo en instituciones de educación superior: Un análisis a través de Bibliometrix R]. *Ingeniare*, *29*(3), 472 – 486. <https://doi.org/10.4067/S0718-33052021000300472>
- Peh, K. S.-H., Soh, M. C. K., Sodhi, N. S., Laurance, W. F., Ong, D. J., & Clements, R. (2011). Up in the clouds: Is sustainable use of tropical montane cloud forests possible in Malaysia? *BioScience*, *61*(1), 27 – 38. <https://doi.org/10.1525/bio.2011.61.1.8>
- Piyaphanee, W., Wattanagoon, Y., Silachamroon, U., Mansanguan, C., Wichianprasat, P., & Walker, E. (2009). Knowledge, attitudes, and practices among foreign

- backpackers toward malaria risk in Southeast Asia. *Journal of Travel Medicine*, 16(2), 101 – 106. <https://doi.org/10.1111/j.1708-8305.2008.00282.x>
- Pookhao Sonjai, N., Bushell, R., Hawkins, M., & Staiff, R. (2018). Community-based ecotourism: beyond authenticity and the commodification of local people. *Journal of Ecotourism*, 17(3), 252–267. <https://doi.org/10.1080/14724049.2018.1503502>
- Pranckutė, R. (2021). Web of science (Wos) and scopus: The titans of bibliographic information in today's academic world. *Publications*, 9(1). <https://doi.org/10.3390/publications9010012>
- Pratiwi, S., & Juerges, N. (2022). Digital advocacy at the science-policy interface: Resolving land-use conflicts in conservation forests. *Land Use Policy*, 121. <https://doi.org/10.1016/j.landusepol.2022.106310>
- Pröbstl-Haider, U., Lund-Durlacher, D., Antonschmidt, H., & Hödl, C. (2018). Mountain bike tourism in Austria and the Alpine region—towards a sustainable model for multi-stakeholder product development. *Journal of Sustainable Tourism*, 26(4). <https://doi.org/10.1080/09669582.2017.1361428>
- Pukkalanun, N., Inkapatanakul, W., Piputsitee, C., & Chunkao, K. (2013). An analysis of the environmental vulnerability index of a small island: Lipe island, kho sarai sub-district, mueang district, Satun province, Thailand. *Modern Applied Science*, 7(2), 33 – 38. <https://doi.org/10.5539/mas.v7n2p33>
- Purnomo, M., Maryudi, A., Dedy Andriatmoko, N., Muhamad Jayadi, E., & Faust, H. (2022). The cost of leisure: the political ecology of the commercialization of Indonesia's protected areas. *Environmental Sociology*, 8(2), 121 – 133. <https://doi.org/10.1080/23251042.2021.2001990>
- Purwoko, A., Zaitunah, A., Samsura, D. A. A., Sibarani, R., Muda, I., & Faustina, C. (2023). Assessing the development potential, feasibility and visitor assessment in the sipinsur geosite natural tourism area, toba caldera global geopark, indonesia. *Geojournal of Tourism and Geosites*, 49(3), 1075 – 1086. <https://doi.org/10.30892/gtg.49323-1107>
- Raihan, A. (2023). The dynamic nexus between economic growth, renewable energy use, urbanization, industrialization, tourism, agricultural productivity, forest area, and carbon dioxide emissions in the Philippines. *Energy Nexus*, 9. <https://doi.org/10.1016/j.nexus.2023.100180>
- Raihan, A., Muhtasim, D. A., Farhana, S., Rahman, M., Hasan, M. A. U., Paul, A., & Faruk, O. (2023). Dynamic Linkages between Environmental Factors and Carbon Emissions in Thailand. *Environmental Processes*, 10(1). <https://doi.org/10.1007/s40710-023-00618-x>
- Razak, N. A., Afandi, S. H. bin M., Shuib, A., & Ghani, A. N. A. (2018). Visitors travelling time cost for ecotourism at Matang Mangrove Forest Reserve. *International Journal of Business and Society*, 19(S1), 117 – 127.
- Richards, D. R., & Friess, D. A. (2016). Rates and drivers of mangrove deforestation in Southeast Asia, 2000-2012. *Proceedings of the National Academy of Sciences of the United States of America*, 113(2). <https://doi.org/10.1073/pnas.1510272113>
- Sarira, T. V., Zeng, Y., Neugarten, R., Chaplin-Kramer, R., & Koh, L. P. (2022). Co-benefits of forest carbon projects in Southeast Asia. *Nature Sustainability*, 5(5). <https://doi.org/10.1038/s41893-022-00849-0>
- Stibig, H. J., Achard, F., Carboni, S., Raši, R., & Miettinen, J. (2014). Change in tropical forest cover of Southeast Asia from 1990 to 2010. *Biogeosciences*, 11(2). <https://doi.org/10.5194/bg-11-247-2014>

- Stronza, A. L., Hunt, C. A., & Fitzgerald, L. A. (2019). Ecotourism for conservation? *Annual Review of Environment and Resources*, 44, 229–253.
- Syamsul Herman, M. A., Shuib, A., Ramachandran, S., Mohd Rusli, Y., & Richards, A. (2012). The need for recreational economic valuation at perlis state park. *Malaysian Forester*, 75(1), 73–80.
- Treephan, P., & Visuthismajarn, P. (2019). Study of potential ecotourism resources: Ban Hua Thang, Muang District, Satun Province, Thailand. *African Journal of Hospitality, Tourism and Leisure*, 8(4).
- Trisurat, Y., Alkemade, R., & Verburg, P. H. (2010). Projecting land-use change and its consequences for biodiversity in northern thailand. *Environmental Management*, 45(3). <https://doi.org/10.1007/s00267-010-9438-x>
- Tsilika, K. (2023). Exploring the Contributions to Mathematical Economics: A Bibliometric Analysis Using Bibliometrix and VOSviewer. *Mathematics*, 11(22). <https://doi.org/10.3390/math11224703>
- Utama, I. G. B. R., Laba, I. N., Junaedi, I. W. R., Krismawintari, N. P. D., Turker, S. B., & Juliana, J. (2021). Exploring key indicators of community involvement in ecotourism management. *Journal of Environmental Management and Tourism*, 12(3), 808 – 817. [https://doi.org/10.14505/jemt.v12.3\(51\).20](https://doi.org/10.14505/jemt.v12.3(51).20)
- Utami, I., Hapsari, A. N. S., & Kean, Y. Y. W. (2020). Synergy of local wisdom values and governmental programs in cultural village social enterprises. *International Journal of Engineering Research and Technology*, 13(12), 4585 – 4590.
- Walton, M. E. M., Samonte-Tan, G. P. B., Primavera, J. H., Edwards-Jones, G., & Le Vay, L. (2006). Are mangroves worth replanting? The direct economic benefits of a community-based reforestation project. *Environmental Conservation*, 33(4), 335–343. <https://doi.org/10.1017/S0376892906003341>
- Wei, X., Liang, C., & Chen, W. (2022). Exploring Current Status and Evolutionary Trends on the Paid Use of State-Owned Forest Resources in China: A Bibliometric Perspective. In *Sustainability (Switzerland)* (Vol. 14, Issue 9). <https://doi.org/10.3390/su14095516>
- Wong, G. Y., Moeliono, M., Bong, I. W., Pham, T. T., Sahide, M. A. K., Naito, D., & Brockhaus, M. (2020). Social forestry in Southeast Asia: Evolving interests, discourses and the many notions of equity. *Geoforum*, 117(March), 246–258. <https://doi.org/10.1016/j.geoforum.2020.10.010>
- Yasmi, Y. (2003). Understanding conflict in the co-management of forests: The case of Bulungan Research Forest. *International Forestry Review*, 5(1), 38–44. <https://doi.org/10.1505/IFOR.5.1.38.17424>
- Zoletto, B., & Cicuzza, D. (2022). Heath Forest in Tropical Southeast Asia: Its Ecology and Conservation Risk. In *Imperiled: The Encyclopedia of Conservation: Volume 1-3* (Vols. 1–3). Elsevier. <https://doi.org/10.1016/B978-0-12-821139-7.00235-X>