

MANGROVE ECOTOURISM RESEARCH PROGRESS, TRENDS, AND UPDATES: A BIBLIOMETRIC ANALYSIS BASED ON THE SCOPUS AND WEB OF SCIENCE DATABASES

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Abstract: Using bibliometric analysis, this study aims to examine the progress, trends, and updates of mangrove ecotourism research within tourism studies. The primary data for this study were collected from the Scopus database with 306 publications and the Web of Science (WoS) database with 585 publications of mangrove ecotourism scientific documents published until the end of 2022. The results show that the first publication on mangrove ecotourism in the Scopus database was identified in 1992, while the first documents on the topic were included in the WoS database six years earlier, in 1986. The prominent keywords of mangrove ecotourism topics shared by publications in the Scopus and WoS databases were predominantly related to environmental and sustainability issues, such as conservation, biodiversity, and sustainable development. Based on geographical distribution, Asian countries and institutions have dominated recent publications on mangrove ecotourism. This means that the geographical distribution of publications on mangrove ecotourism is strongly influenced by the geographical distribution of mangrove ecosystems, which are mostly found in Asia.

Key words: Mangrove, ecotourism, bibliometrics analysis, Scopus, Web of Science (WoS)

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INTRODUCTION

Mangroves cover 13,760,000 ha of coastal land worldwide, especially along tropical and subtropical shorelines and river estuaries (Bunting et al., 2018; Ochoa-Gómez et al., 2019; Trialfhianty et al., 2022). Mangroves, which serve as tourist attractions, are considered capable of attracting tourists in tens of hundreds of millions, with a financial turnover of billions of dollars (Spalding and Parrett, 2019). In general, various recreational activities developed at mangrove-based tourism sites attract tourists with a wide range of visits and recreational spending durations, ranging from single-day trips to overnight boat tours, with a focus on wildlife, bird watching, and fishing (Avau et al., 2011). Approximately 3,945 mangrove tourist attractions are identified across the globe, stretching from the Caribbean, North America, Central America, South America, East Africa, Central Africa, West Africa, the Middle East, South Asia, East Asia, South East Asia, and the Pacific in 93 countries (Spalding and Parrett, 2019).

Those mangrove tourist attractions are commonly managed under an ecotourism approach because they are protected due to the fact that mangroves are pivotal coastal elements that provide numerous ecosystem services and perform crucial ecological functions (Barbier et al., 2011; Friess, 2017; Kauffman et al., 2020). In general, ecotourism is widely considered a sustainable alternative for mangrove conservation as well as poverty alleviation for locals (Santos et al., 2017). Prior studies have shown that mangrove ecosystems are capable of significantly absorbing and storing carbon - three times more than other ecosystems—making this function critical for climate change mitigation and adaptation

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(Alongi, 2014; Donato et al., 2011; Howard et al., 2017; Kauffman et al., 2020; Murdiyarso et al., 2015; Mursyid et al., 2021; Ward et al., 2016). Mangroves, on the other hand, are thought to be marine habitats, sedimentation regulators in downstream areas, able to withstand waves, storms, and even tsunamis (Barbier et al., 2011; Friess, 2016; Kauffman et al., 2020). Besides playing an important role in providing environmental services and tourism-related utilization, mangrove ecosystems are constantly assumed to have high socio-economic potential for other objectives (Friess, 2016, 2017; Hakim et al., 2017; Mursyid et al., 2021). For recent decades, local communities have routinely used mangrove products on a small scale for charcoal, building materials, fishing gear, firewood, and a variety of other non-timber products, such as tannin, medicinal products, and saps (Kusmana, 2018; Mursyid et al., 2021).

Furthermore, mangrove ecotourism is commonly defined as nature-based tourism which occurs in a mangrove ecosystem, are primarily learning-focused in terms of the interaction between the tourist and these natural attractions, and are projected to be environmentally and socio-culturally sustainable (Fennell and Weaver, 2005; Weaver, 2002; Weaver, 2001; Weaver and Lawton, 2007). It means that mangrove ecotourism is nature-based travel that conserves the mangrove environment, supports the prosperity of the local communities surrounding the mangrove ecosystem, and includes mangrove interpretation and education (Björk, 2000; Shasha et al., 2020).

Despite the fact that the definition of mangrove ecotourism is still associated with the notion of ecotourism in general, there are some notes that describe mangrove ecotourism, for example, the studies of Friess (2017), which mention that mangrove ecotourism is one of the neo-liberal economic tools that have been promoted for mangrove conservation alongside Corporate Social Responsibility (CSR) and Payment for Ecosystem Services (PES). The proliferation of mangroves that are used for ecotourism attraction has encouraged numerous scientific articles that discuss the mangrove ecosystem in relation to the tourism industry (Kanniah et al., 2015; Marasinghe et al., 2021; Mehvar et al., 2018; Mendoza-González et al., 2012; Murtini et al., 2018; Putri et al., 2020; Rudiastuti et al., 2018; Ryan et al., 2012; Salam et al., 2000; Samonte-Tan et al., 2007; Spalding and Parrett, 2019; Windevoxhel et al., 1999). Meanwhile, on the other hand, the rapid growth of the digital platforms and internet has created new opportunities for data processing and analysis, such as bibliometric (Salouw et al., 2023), including for mangrove ecotourism discussion. A bibliometric analysis is a quantitative examination method that focuses on documents, mostly scientific, such as articles and books, to uncover research categories, publication types, key research institutions, citation patterns, and countries, as well as keyword and title content analysis (Heersmink et al., 2011; Shasha et al., 2020).

Bibliometric analyses have the potential for creating a significant impact on both scholars and practitioners given that they provide a wider range of options for (re)designing their next steps in order to expedite advancement in certain disciplines or fields (Köseoglu et al., 2021; Zupic and Čater, 2015). Within tourism studies, bibliometric analysis is pivotal for external evaluation to investigate research quality, interest in impact and prestige factors, and the development of the field of study (Hall, 2011). Numerous studies on tourism-related topics using bibliometric analysis have been published in a variety of journals (Bhowmik, 2021; Comerio and Strozzi, 2019; de la Hoz-Correa et al., 2018; Garrigos-Simon et al., 2018, 2019; Hall, 2011; Jiang et al., 2019; Köseoglu, Sehitoglu, et al., 2016; Köseoglu, Rahimi, et al., 2016; Köseoglu, Sehitoglu, and Craft, 2015; Köseoglu, Sehitoglu, and Parnell, 2015; Mariani and Baggio, 2022; Niñerola et al., 2019; Pathmanandakumar et al., 2021; Rodríguez-López et al., 2020; Salouw et al., 2023; Sánchez et al., 2017; Senbeto et al., 2021; Shasha et al., 2020; Vishwakarma and Mukherjee, 2019; Wong et al., 2021), and they always provide new perspectives to the debates and discussions within tourism studies (Salouw et al., 2023).

Most of these studies discuss particular topics and issues related to tourism within specific timeframes using bibliometric analysis, such as quality in tourism (Garrigos-Simon et al., 2019), tourism and sustainability (Garrigos-Simon et al., 2018; Niñerola et al., 2019), climate change and coastal tourism (Pathmanandakumar et al., 2021), tourism crisis and disaster management (Jiang et al., 2019), economic impact of tourism (Comerio and Strozzi, 2019), higher tourism education (Simsek and Kalipci, 2023), gender perspectives in tourism (Figuroa-Domecq et al., 2015; Kabil et al., 2022), tourism knowledge (Köseoglu et al., 2021), contemporary tourism research (Yuan et al., 2015), religious tourism and pilgrimage (Durán-Sánchez et al., 2018), cross-border tourism (Salouw et al., 2023), sport tourism and sustainability (Kumar et al., 2023), wellness tourism (Polat and Köseoglu, 2022), wine tourism (Sánchez et al., 2017), and medical tourism (de la Hoz-Correa et al., 2018).

Several previous studies have also focused on examining ecotourism topics and issues using bibliometric analysis. For instance, firstly, Liu and Li (2020) investigated research trends in ecotourism using bibliometric analysis on 2,531 scientific publications related to ecotourism from Web of Science (WoS) databases from 1990 to 2016. The results suggest that *Tourism Management* was the most productive journal, whereas the Chinese Academy of Sciences was the most prolific contributor among the research institutions. Meanwhile, authors from the United States have published articles more frequently than those from any other country. China, the United States, and South Africa are the top three countries in ecotourism research case studies. It also revealed that the primary focus of ecotourism research was conservation; protected areas were the primary study objects, and sustainable tourism was the primary goal.

Secondly, Shasha et al. (2020) employed bibliometric analysis to uncover dynamic trends, academic collaboration, and research hotspots relevant to ecotourism, published between 2001 and 2018 in the Scopus and Web of Science (WoS) databases. According to these findings, the total number of relevant papers has increased continuously. The *Journal of Hospitality and Tourism Management*, *Annals of Tourism Research*, *Conservation Biology*, and *Biological Conservation* are all important journals. The Chinese Academy of Science is the most influential institution, with the most publications and worldwide co-authorship. Furthermore, research keywords such as eco-tourism, management, biodiversity, national parks, sustainability, and sustainable tourism were identified.

Thirdly, Khanra et al. (2021) performed a bibliometric analysis to examine the present knowledge regarding ecotourism from a total of 878 articles published in six reputable journals, which are the *Annals of Tourism Research*, the *Journal of Travel Research*, *Tourism Management*, the *International Journal of Contemporary Hospitality Management*, the *International Journal of Hospitality Management*, and the *Journal of Sustainable Tourism*, between 1990 and 2019. The result shows that there are four main clusters as thematic areas of ecotourism research publication, namely: a) ecological preservation of tourist destinations; b) carbon footprint from tourist mobility; c) protecting residents' interests in tourist destinations; and d) tourist attitudes and behaviour towards sustainability. Fourthly, Hasana et al. (2022) employed bibliometric analysis to quantitatively evaluate publications on ecotourism in protected areas based on 1182 research articles published in the Scopus database between 2002 and 2020. The majority of ecotourism research articles are published in the United States, the United Kingdom, Australia, South Africa, Canada, and China, according to the data. The primary research subjects of publications on ecotourism in protected areas are conservation, visitor management, and community. As a result, some contentious topics regarding ecotourism and its relationship to protected areas, dominated by human-wildlife conflict, gender, and climate change, have attracted the attention of scholars worldwide. Fifthly, Singh et al. (2022) used bibliometric analysis to determine publication trends and conceptual, intellectual, and collaborative structures related to ecotourism issues, particularly in the *Journal of Ecotourism*. The findings reveal that five and three clusters were discovered by co-word and co-citation analysis, respectively. The collaboration structure demonstrated good collaboration between authors in the *Journal of Ecotourism*, with collaborative research accounting for 70% of the work accomplished.

Given the preceding explanation, despite the publication of numerous bibliometric studies on tourism-related themes, including discussions of ecotourism in general, very few bibliometric analyses of mangrove ecotourism publications in particular have been executed. In parallel with these circumstances, this study aims to explore research progress, trends, and updates related to mangrove ecotourism publications using bibliometric analysis methods by visiting the Scopus and WoS databases, as no previous studies have been conducted before. This effort is important for determining the extent to which discussions on mangrove ecotourism have been drawn, which will help direct future research on this topic, considering mangrove ecotourism is a global phenomenon that has occurred worldwide.

MATERIALS AND METHODS

Identifying and analysing published literature, both quantitatively and qualitatively, has become an important agenda for many disciplines (Keathley-Herring et al., 2016). Therefore, methods such as systematic literature review and bibliometric analysis have been routinely used to develop a greater understanding of a particular area of research (Keathley-Herring et al., 2016). The combination of systematic literature review and bibliometric analysis obviously has a substantial impact on increasing knowledge production while observing the evolution of a science (Salouw et al., 2023; Small, 1977), as provided by previous studies. This process can be conducted in various fields of science by applying rigorous analysis procedures to literary sources, such as magazines, journals, books, and various other written documents, to produce decent information (Keathley-Herring et al., 2016; Salouw et al., 2023).

For particular reasons, our study preferred bibliometric analysis over combining it with a systematic literature review. To begin, despite the fact that several literature review studies used a combination of the two procedures (systematic literature review and bibliometric analysis), there were certainly some indications that combining two analytical methodologies in one research may produce reader misunderstanding (Kabil et al., 2022; Khoo-Lattimore et al., 2019). As a result, rather than performing a systematic literature review, which might incorporate a meta-analysis in its setting, we chose bibliometric analysis and compensated by using more than one primary data source, which may help mitigate the drawbacks of a single study procedure (Kabil et al., 2022), such as Scopus and Web of Science (WoS).

Specific to bibliometric analysis, it is widely recognised as a cross-disciplinary research technique that relies on quantitative analysis with mathematical and statistical methods approaches (Liao et al., 2018; Merigó et al., 2015, 2016), to create a map of the structure and patterns of knowledge on data repositories as part of the development of a particular field of study (Liao et al., 2018; Salouw et al., 2023). In general, bibliometric analysis is thought to stem from the literature review method, which is carried out systematically, clearly, and repeatedly (Salouw et al., 2023). A variety of databases, including Scopus, Web of Science (WoS), PubMed, and ProQuest, may be employed to select appropriate information for bibliometric analysis (Alryalat et al., 2019; Rahman et al., 2023). As mentioned above, we employed multiple primary data sources to conduct a bibliometric analysis by visiting the Scopus and WoS databases to obtain relevant literature for the data studied, which focuses on mangrove ecotourism-related research.

With more than 20,000 journals provided, Scopus and WoS were chosen for this study because their databases are trusted and enabled us to obtain very proper data coverage as well as improved data quality, retrieval, and cleanliness (Mariani and Baggio, 2022; Wijayanti et al., 2023). Scopus is the first database used in this study, with 22,800 journals from 5,000 publishers worldwide, whose catalogue consists of various disciplines, ranging from environmental, biological, agricultural, and social sciences (Wijayanti et al., 2023). Subsequently, Web of Science (WoS) was the second database used in this study, which contains more than 33,000 journals in over 256 disciplines, including environmental studies, interdisciplinary social studies, development studies, and planning (Wijayanti et al., 2023).

We executed bibliometric analysis on three types of bibliometric variables, including: a) quantity indicators, for example, which refer to the output of journals or authors; b) quality indicators, which indicate the significance and influence of authors, publications, and journals; and c) structural indicators, which emphasise the relationship and interconnection of research topics, countries, and researchers (Durieux and Geveno, 2010; Hasana et al., 2022). Furthermore, to perform bibliometric analysis, we followed the seven fundamental stages introduced by Oliveira et al.

(2019) to examine these three types of bibliometric variables, which included: 1) defining the field of study; 2) defining search platforms; 3) mining bibliometric data; 4) importing data; 5) analysing bibliometric data; 6) mapping the state of the art and identification, as well as grouping and analysing gaps and trends; 7) drawing conclusions. The following section is a practical explanation of each of these seven stages (Figure 1).

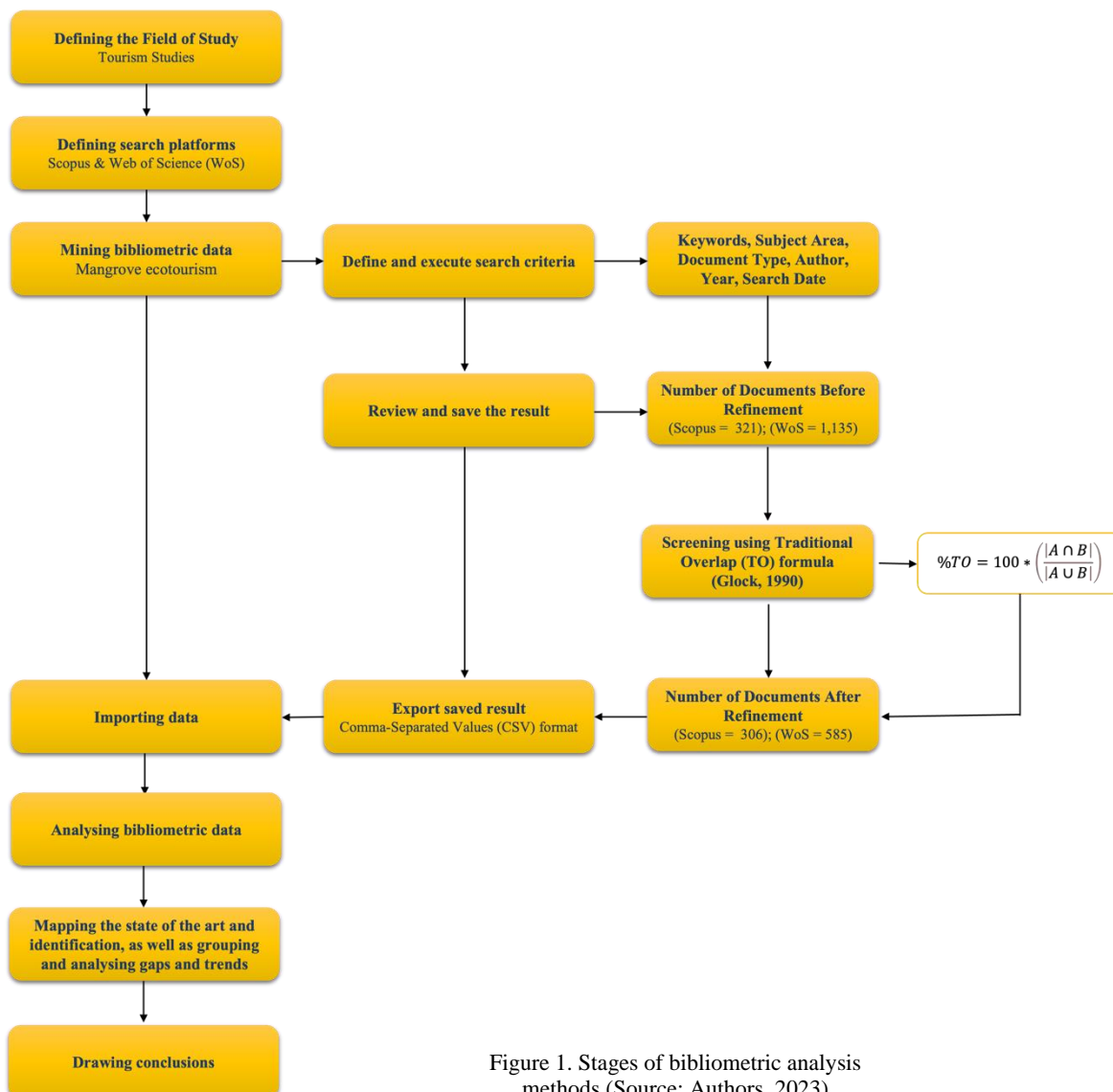


Figure 1. Stages of bibliometric analysis methods (Source: Authors, 2023)

- 1) Defining the field of study: The primary field of science for this research is tourism studies.
- 2) Defining search platforms: This study selected Scopus and Web of Science (WoS) as database platforms based on the feasibility and reliability of scientific articles used for data, the scope of the field of science, opportunities to improve data quality, and the convenience of accessing the data.
- 3) Mining bibliometric data: a) Define and execute search criteria
To select publications related to mangrove ecotourism, both in the Scopus and Web of Science (WoS) databases, we defined and executed search criteria, as shown in Table 1, as follows:

Table 1. Criteria for publications searching in the Scopus and Web of Science (WoS) databases

Criteria	Scopus	Web of Science (WoS)
Keywords	“mangrove” AND “ecotourism” OR “eco-tourism”	“Mangrove” AND “Ecotourism” OR “Eco-tourism”
Subject area	Environmental Science; Earth and Planetary Science; Agricultural and Biological Science; Social Science; Business, Management, and Accounting; Engineering, Economics, Econometrics, and Finance; Arts and Humanities; Multidisciplinary	Hospitality, Leisure, Sport, and Tourism; Forestry; Marine Biology; Management; Sustainability Science; Human Geography; Economics; Education and Educational Research; Environmental Sciences; Transportation; Bibliometrics, Scientometrics and Research Integrity
Document Type	Article, Book Chapter, Review, Conference Paper, Editorial	Article, Book Chapter, Review, Conference Paper, Editorial
Author	Exclude anonymous and undefined document	Exclude anonymous and undefined document
Year	Exclude 2023 – onwards	Exclude 2023 – onwards
Search date	May 10, 2023	May 10, 2023

b) Review and save the result

In order to review the literature obtained, the search is strictly limited to English-language scientific documents published until late 2022. The first phase of data collection involves the exclusion of articles that do not contain mangroves as research locations or as research objects related to ‘ecotourism’ or ‘eco-tourism’. Moreover, it is usual procedure in bibliometric study, according to Köseoglu et al. (2021), to exclude particular categories of items from the analysis for particular reasons, such as the fact that not all scientific publications represent verified knowledge and have complete bibliographic records. In this paper, for example, we eliminated books from the dataset because they typically contain more extensive and broader contents (Chou and Ma, 2010) than journal articles, book chapter, review, conference paper or editorial. Table 2 depicts the comparative findings before and after refining. It illustrates distinctions in the quantity of preliminary and refined search results based on criteria, including subject area, document type, author and year.

Table 2. Comparative findings before and after refinement in Scopus and Web of Science (WoS) databases (Source: Authors, 2023)

Scopus		Web of Science (WoS)	
Number of Findings Before Refinement	Number of Findings After Refinement	Number of Findings Before Refinement	Number of Findings After Refinement
(n = 321)	(n = 306)	(n = 1,135)	(n = 585)

Given this paper combines two databases, Scopus and WoS, Meyer’s Index was employed to examine the database search results in order to remove singularity and overlap. According to Meyer et al. (1983), it is also known as a “relative index of singularities,” and it is used to determine how adequately a database covers a subject. A distinctive document is incredibly valuable, and its value decreases gradually when there are duplicates (weight = 0.5), triplicates (weight = 0.3), and others. The higher the index, the greater the singularity, implying more distinct documents.

$$\text{Meyer's Index} = \frac{\sum \text{Sources} * \text{Weight}}{\text{Total Sources}} \quad * \sum \text{Sources} * \text{Weight} = \text{total number of documents or sources multiplied by the rate of duplication}$$

Furthermore, for calculating database overlap, this article adopted Gluck’s (1990) Traditional Overlap (TO) formula between two secondary databases A and B as:

$$\%TO = 100 * \left(\frac{|A \cap B|}{|A \cup B|} \right) \quad * \%TO = \text{percentage of the ratio of the number of documents at the intersection of two secondary databases to the number at their union; } |A \cap B| = \text{the intersection of documents between database A and database B; } |A \cup B| = \text{the union of documents between database A and database B.}$$

The higher the TO value, the greater the similarity between the databases. A coefficient of 0.15, for example, reflects a 15% similarity level; yet, there is an 85% difference. The Relative Overlap (RO) is a metric applied to assess the coverage of a database, as well as its relationship to another (Bearman and Kunberger, 1977; Hood and Wilson, 2003).

$$\%Overlap \text{ in A} = 100 * \left(\frac{|A \cap B|}{|A|} \right) \quad \%Overlap \text{ in B} = 100 * \left(\frac{|A \cap B|}{|B|} \right)$$

*A = Database A; B = Database B; %Overlap in A = the percentage of overlap documents or sources in database A; %Overlap in B = the percentage of overlap documents or sources in database B; $|A \cap B|$ = the intersection of documents between source A and source B.

c) Export saved result :Following the completion of the review and saving of the result in terms of a literature search, the next step is to import the library source metadata into Comma-Separated Values (CSV) format in order to ensure and improve data quality, including removing duplication. To this end, the Mendeley software is employed for data compilation and virtual file cabinets.

4) Importing data:After determining the criteria, the recorded data is then exported to the VOSViewer program, which is a valuable software designed for constructing and viewing bibliometric maps (Van Eck and Waltman, 2010).

5) Analysing bibliometric data: Analysing bibliometric data can be perceived as an operational endeavour to examine saved data by investigating research information quantitatively involving three types of bibliometric variables, such as quantity, quality, and structural indicators.

6) Mapping the state of the art and identification, as well as grouping and analysing gaps and trends

The operationalization of the VOSViewer programme allows for mapping the state of the art and identification, as well as grouping and analysing gaps and trends. In practise, the VOSViewer programme operates by analysing authors, countries, institutions, article keywords, timelines, and interactions. Subsequently, distance-based maps—in which the distance between two items on a map reflects the intensity of their relationship—and graph-based maps—in which the distance between the two items does not have to indicate the strength of their relationship (Van Eck and Waltman, 2010)—are generated depending on the investigation’s results.

7) Drawing conclusions: This step refers to extracting and interpreting information that was implied or inferred according to the analysis. In this step, we also attempted to delve into the findings in order to provide insight based on the study’s findings while outlining issues that may be addressed in the future, both conceptually and practically, particularly in the context of mangrove ecotourism.

FINDINGS AND DISCUSSION

1. Publication progress of mangrove ecotourism over the year

There are differences in the publication of mangrove ecotourism in Scopus and the Web of Science (WoS). For

example, in terms of quantity, the WoS database contains more mangrove ecotourism publications than the Scopus database does. Moreover, since the publication of mangrove ecotourism, WoS has consistently recorded more documents than Scopus in terms of number. Nevertheless, both the Scopus and WoS databases suggest that publications on mangrove ecotourism have increased significantly during the last five years. The largest number of publications related to the topic from the two databases was recorded in 2021.

Figure 2 shows the publication progress of mangrove ecotourism over the years in the Scopus and WoS databases. The first mangrove ecotourism publications were indexed in the Scopus database in 1992, while the earliest documents relating to the topic were included in the WoS database six years earlier, in 1986. The finding shows that the mainstreaming of the ecotourism concept, including its deployment for mangrove ecosystem study, has a connection to the term, which first appeared in academic literature and was promoted by Ceballos-Lascurain in the mid-1980s (Diamantis, 1999; Donohoe and Needham, 2006; Weaver, 2001, 2002). Although some argue that the term “ecotourism” or “eco-tourism” originally emerged in 1973 (Shasha et al., 2020), it was later continued by Parks Canada, which polarised ecotourism by publishing a 16-page guidebook titled “Ecotour of the Rideau Canal” in 1978 (McKercher, 2010).

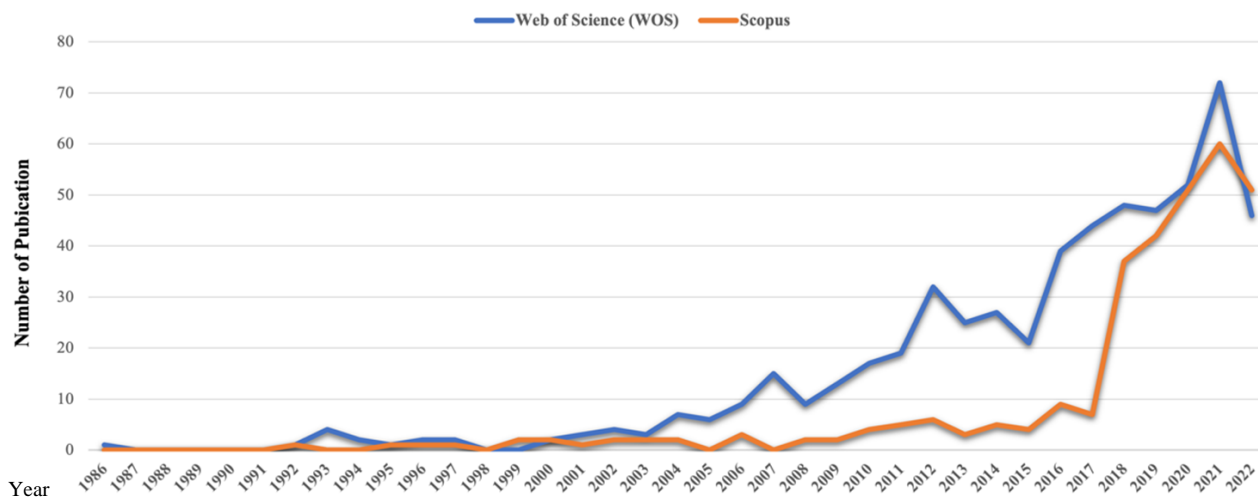


Figure 2. Publication progress related to mangrove ecotourism in the Scopus and Web of Science (WoS) databases (Source: Authors, 2023)

The number of mangrove ecotourism publications was relatively small until the early 2000s, but increased significantly around the 2010s. This circumstance is inextricably related to the worldwide issue of using mangroves as carbon sinks, which coincides with the global agenda of dealing with the impacts of climate change. In addition, the discourse on the blue economy is also considered an influential base for increasingly massive writings or publications on mangrove ecotourism. For example, in the 2010s, after Gunter Pauli published a book entitled *The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs*, international organisations such as the World Bank launched *Problue*, a Blue Economy-based programme. One of the focal points of the programme is the long-term growth of crucial oceanic sectors such as tourism. Mangroves are receiving attention in this setting because they contribute to the attraction of marine tourism.

Furthermore, the number of studies on the topic fell significantly between 2021 and 2022. This condition influenced by the fact that since the start of the pandemic, which began in 2020 and generally ended in 2022, there has been an increase in research focusing on the COVID-19 pandemic and its impact on the tourism industry, motivated by uncertainty about the future of tourism and the need to respond to the new challenges facing the industry (Menon et al., 2022; Utkarsh and Sigala, 2021; Viana-Lora and Nel-lo-Andreu, 2022). Most of the research is concentrated on assessing the risk of contagion in the tourism industry and developing strategies to recover activity in the general landscape (Viana-Lora and Nel-lo-Andreu, 2022), with very few exceptions focusing on mangrove ecotourism. As a result, scientific publications on mangrove ecotourism decreased dramatically during that period.

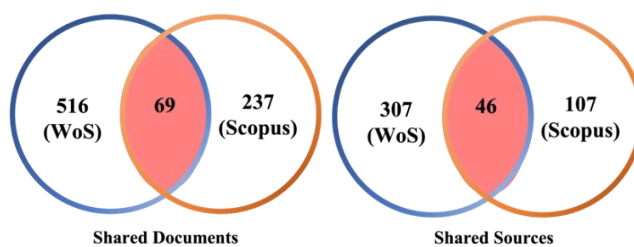


Figure 3. Number of shared documents and sources in the Scopus and Web of Science (WoS) databases (Source: Authors, 2023)

2. Singularity and overlap

According to the comparative findings of the literature search in Table 1, 306 documents from 153 sources related to mangrove ecotourism were identified in the Scopus database, following the refinement process until late 2022. However, the Web of Science (WoS) database has published more documents associated with the topic of mangrove

ecotourism, totaling 585 from 353 sources after the refinement procedure. After all necessary calculations, it was discovered that 69 documents overlapped (found in both databases). Additionally, these were perceived as duplicates, representing 23% and 12% of the Scopus and WOS databases, respectively. The remaining were non-duplicates, of which 237 (77%) and 516 (88%) were obtained from Scopus and WOS, respectively.

Figure 3 shows the number of shared documents and sources in the Scopus and Web of Science (WoS) databases related to mangrove ecotourism publications. Furthermore, according to the formula used in this study, 8% was obtained as the Traditional Overlap (TO) calculation based on Gluck (1990), which is shown as follows:

Table 3. Singularity database (Source: Authors, 2023)

Databases	% of single document/source		Meyer's Index	
	Documents	Sources	Documents	Sources
Scopus	82%	78%	0.37	0,69
WoS	88%	30%	0.56	1,46

$$\%TO=100\left(\frac{Scopus \cap WoS}{Scopus \cup WoS}\right) \Rightarrow \%TO = \frac{69}{306+585-9} \Rightarrow \%TO=8\%$$

* %TO = the percentage of the ratio of the number of documents at the intersection of two secondary databases to the number at their union; $|Scopus \cap WoS|$ = the intersection of documents between Scopus and WoS; $|Scopus \cup WoS|$ = the union of documents between Scopus and WoS

Based on the calculation, only 8% of the documents in the two databases are similar in terms of content. In other words, 92% of the documents are distinct and exist only in one database. This demonstrates that significant gaps in terms of number occurred in scientific documents on mangrove ecotourism listed in Scopus and the WoS database.

To gain more information regarding singularity and overlap, a relative overlap formula was employed to determine the proportion of Scopus coverage for WOS and vice versa:

$$\% TO WoS = 100 * \left(\frac{|Scopus \cap WoS|}{WoS}\right) \Rightarrow \% TO WoS = 100 * \left(\frac{69}{585}\right) = 12\%$$

$$\% TO Scopus = 100 * \left(\frac{|Scopus \cap WoS|}{Scopus}\right) \Rightarrow \% TO Scopus = 100 * \left(\frac{69}{306}\right) = 23\%$$

* % TO WoS = the percentage of the traditional overlap in WoS; $|Scopus \cap WoS|$ = the intersection of documents between Scopus and WoS; % TO Scopus = percentage of the traditional overlap in Scopus

Scopus covers 12% of documents in WOS, while 23% of documents in the Scopus database are covered by WoS. This indicates that the WoS database has more unique documents and covers numerous sources in the context of mangrove ecotourism publications. This finding provides a significant distinction from several previous studies that reported that the singularity of Scopus is higher than WoS. For example, in research publications regarding wine tourism from Sánchez et al., 2017, tourism innovation from Durán-Sánchez et al., 2019 and community-based tourism from Álvarez-García et al., 2018.

3. Co-occurrence of keywords in mangrove ecotourism

The co-occurrence of keywords in bibliometrics analysis is beneficial for displaying particular topics of study in advanced manner while providing information about documents in the database (Garrigos-Simon et al., 2019; Sánchez et al., 2017). In this sense, the idea is that the co-occurrence of keywords describes the contents of the documents in a file, leading to the premise that each research field may be characterised by a list of its most important keywords (de la Hoz-Correa et al., 2018). In this study, from a total of 1,716 keywords on Scopus and 2,040 keywords on the Web of Science (WoS) database, the top ten keywords related to mangrove ecotourism publications can be seen in Table 4, as follows:

Table 4. Co-occurrence of keywords in mangrove ecotourism scope (Source: Author's elaboration, 2023)

R	Scopus	F	C (%)	Web of Science (WoS)	F	C (%)
	Keywords			Keywords		
R1	ecotourism	105	6,12	eco-tourism	123	5,03
R2	mangrove	88	5,13	ecotourism	110	4,50
R3	ecosystems	51	2,97	conservation	77	3,15
R4	biodiversity	44	2,56	tourism	74	3,02
R5	forestry	34	1,98	mangrove	62	2,53
R6	sustainable development	34	1,98	sustainability	44	1,80
R7	conservation	33	1,92	sustainable development	37	1,51
R8	mangrove forest	32	1,86	biodiversity	33	1,35
R9	ecology	28	1,63	protected areas	29	1,19
R10	mangrove ecosystems	27	1,57	ecosystem services	28	1,14

*R = Rank; F = Frequency (number of occurrences of keywords); C = Coverage (percentage coverage of keywords in database).

The first rank of the top ten keywords related to mangrove ecotourism publications on Scopus and WoS is substantially identical, namely "ecotourism" or "eco-tourism". In general, keywords intersecting with environmental issues dominated the top ten prominent keywords identified in both Scopus and the WoS databases. This is reflected in keywords such as

"mangrove ecosystems", "ecology", "forestry", "protected areas", and "ecosystem services". Furthermore, the same important keywords documented by the Scopus and WoS database underline the main topic of discussion on environmental issues, with terms such as "conservation" and "biodiversity" being used. Apart from keywords related to environmental issues, "sustainability" and "sustainable development" are frequently encountered in publications on mangrove ecotourism. This implies that sustainability and sustainable development, particularly in the tourism sector, are the primary frameworks employed by many scholars worldwide as a theoretical foundation for studying mangrove ecotourism. In other words, sustainability or sustainable development is a 'buzzword' approach in the study of mangrove ecotourism.

On the other hand, this condition is inseparable from the ontological position of ecotourism, which is widely articulated as a derivative of the concept of sustainable tourism (Fennell and Dowling, 2003). However, for decades, ecotourism has been widely regarded as important for protecting fragile ecosystems as it can generate revenue for the protection of natural resources while also promoting viable economic development for local communities, improving ecological and cultural sensitivity, instilling environmental awareness in the travel industry, satisfying and educating tourists, and, some claim, contributing to building world peace (Demir et al., 2016; Honey, 2008:4). Unsurprisingly, the sustainability of mangrove ecosystems is a fundamental concern in many studies on mangrove ecotourism.

Furthermore, the employment of the sustainability paradigm in mangrove ecotourism research is inextricably linked to the fact that mangrove ecosystems have been lost and harmed for centuries because of human exploitation (Feller et al., 2017). It was initially predicted that by the end of the twentieth century, 35% of the natural mangrove area would have already been lost (Valiela et al., 2001). Mangroves were also considered to be losing 1–3% of their area globally per year, with substantial regional variation (FAO, 2007). Nevertheless, mangrove loss in the early twenty-first century has been considerably less than predicted (Spalding et al., 2010), with a global-scale remote sensing study reveals that yearly rates of mangrove deforestation averaged 0.2-0.7% between 2000 and 2012 (Hamilton and Casey, 2016). This situation emerged as a result of various countries introducing conservation and sustainable forest management legislation and pursuing community-based management in order to reduce mangrove deforestation rates (Feller et al., 2017; Friess et al., 2016). In light of that context, sustainability or sustainable development paradigms are frequently incorporated into mangrove studies, including in the context of mangrove ecotourism studies.

4. Most prolific and influential authors

In this section, we attempted to highlight the most prolific and influential authors based on the number of scientific documents they have written and their citations. According to the findings, the Scopus database contains 930 authors who write about mangrove ecotourism. Meanwhile, the number of authors in the Web of Science (WoS) database on mangrove ecotourism is higher, with 1,776 authors. The majority of authors (88.9% and 97.5%, respectively) have only one document published in both the Scopus and WoS databases. This condition is affected by the unique characteristics of mangrove ecotourism as an interdisciplinary field that combines the aspects of ecology, tourism, economics, and social sciences. As a result, authors from different disciplines may collaborate only in a single study, contributing their expertise to the overall understanding of the subject. Subsequently, the ten most productive researchers on the topic of mangrove ecotourism, as shown in Table 5, are as follows:

Table 5. Most influential and prolific authors (Source: Author's elaboration, 2023)

R	Scopus				Web of Science (WoS)			
	Author	TC	F	TC/F	Author	TC	F	TC/F
R1	Dahdouh-Guebas, F.	142	5	28,40	Dahdouh-Guebas, F.	104	4	26,00
R2	Ghosh, A.	41	4	10,25	Thompson, B.S.	98	4	24,50
R3	Bahar, A.	15	4	3,75	Satyanarayana, B.	85	3	28,33
R4	Fattah, M.	15	8	1,88	Carvache-Franco, M.	40	3	13,33
R5	Ginantra, I.K.	13	5	2,60	Ghosh, A.	19	3	6,33
R6	Joni, M.	13	5	2,60	Kusmana, C.	12	3	4,00
R7	Massiseng, A.N.A.	12	4	3,00	Ma, Sheng-Quan	8	3	2,67
R8	Effendi, I.	10	4	2,50	Dehoorne, O.	7	4	1,75
R9	Intyas, C.A.	8	5	1,60	Harahab, N.	7	3	2,33
R10	Muksin, I.K.	8	4	2,00	Singgale, Y.A.	7	3	2,33

*R = rank; F = frequency (number of articles); TC = Total Citation (number of citations received by authors); TC/F = Average citations received by authors

The top ten most prolific and influential authors, as shown in Table 5, contributed 12.68% and 5.64% of the documents in the Scopus and WoS databases regarding mangrove ecotourism, respectively. All the authors included are researchers and are strongly associated with universities worldwide. In general, these authors share research interests and expertise in the natural sciences, including biology, zoology, geography, forestry, oceanography, fisheries, and marine sciences. Because only 8% of the documents in the Scopus and WoS databases related to mangrove ecotourism are similar in terms of content, only two authors are listed in both databases as the most prolific and influential authors on the subject, namely, Farid Dahdouh-Guebas and Aditya Ghosh. Farid Dahdouh-Guebas is the most contributing researcher, with five Scopus publications and four WoS publications on mangrove ecotourism research domains. However, Farid Dahdouh-Guebas was not always the first author to publish scientific research on mangrove ecotourism. Following further examination, his mangrove ecotourism research was usually conducted in collaboration with other scholars. Despite the fact that Farid

Dahdouh-Guebas has consistently published numerous scientific works in broad contexts regarding mangroves, such as mangrove vegetation dynamics, mangrove ethnobiology, and mangrove ecosystem management and governance.

5. Geographical distribution of publication

The geographical distribution of publications in this study explains the origin of mangrove ecotourism research. According to the findings, there are disparities in country/region of origin in mangrove ecotourism research. Table 6 summarises the top ten countries/regions in Scopus and the WoS databases that contributed to the research on mangrove ecotourism.

Table 6. Countries/Regions with the most publications on mangrove ecotourism topic (Source: Author's elaboration, 2023)

R	Scopus				Web of Science (WoS)					
	Country /Region	F	TC	C/F	Coverage %	Country/Region	F	TC	C/F	Coverage %
R1	Indonesia	150	793	5,29	49,02	China	122	995	8,16	20,85
R2	Malaysia	45	411	9,13	14,71	Indonesia	72	453	6,29	12,31
R3	India	21	1209	57,57	6,86	United States	45	1287	28,60	7,69
R4	United States	12	1618	134,83	3,92	Malaysia	39	314	8,05	6,67
R5	Thailand	10	77	7,70	3,27	Australia	27	640	23,70	4,62
R6	United Kingdom	10	169	16,90	3,27	India	25	169	6,76	4,27
R7	Bangladesh	9	30	3,33	2,94	United Kingdom	22	929	42,23	3,76
R8	China	8	38	4,75	2,61	Canada	18	167	9,28	3,08
R9	Belgium	7	156	22,29	2,29	South Africa	17	250	14,71	2,91
R10	Mexico	7	59	8,43	2,29	Taiwan	16	103	6,44	2,74

*R = rank; F = frequency (number of articles); TC = Total Citation (number of citations received by authors); TC/F = Average citations received by authors

Based on the Scopus database, Indonesia is the country of origin for the most research on mangrove ecotourism, accounting for 49.02% of all documents. Meanwhile, China ranks top in the WoS database as the country of creation for studies on mangrove ecotourism, with 20.85% coverage from all publications. Nonetheless, papers from the United States continue to receive the most citations, with 1,618 and 1,287 in the Scopus and WoS databases, respectively. In addition, only six countries/regions have the most Scopus and WoS publications on mangrove ecotourism issues.

The six countries are spread across Asia, North America, and Europe, including: a) Indonesia; b) Malaysia; c) China; d) India; e) the United States; and f) the United Kingdom (Figure 4). Furthermore, The finding in Table 8 is relatively similar to the analysis presented by Liu and Li (2020), which highlighted that from 1990 to 2016, the ten countries producing the most ecotourism publications in general were a) the United States; b) China; c) the United Kingdom; d) Australia; e) Canada; f) South Africa; g) Brazil; f) Malaysia; h) Spain; and i) Taiwan. This means that United States-based authors dominate publications related to ecotourism in general, because scholars from the country have studied ecotourism extensively and collaborated with more than 20 countries authors to publish important works in ecotourism issues (Singh et al., 2022). Meanwhile, the majority of these countries and regions are among the top ten countries and regions with the most publications on mangrove ecotourism topics. Only Brazil and Spain were excluded from this list.

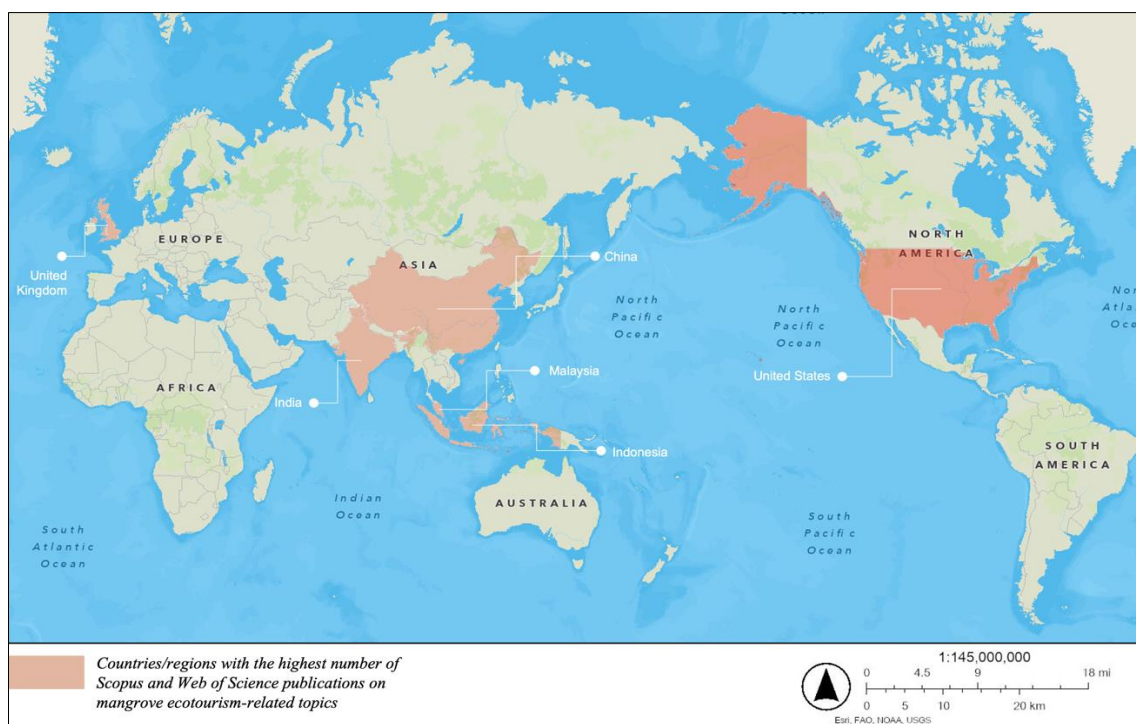


Figure 4. Map of countries/regions with the highest number of Scopus and Web of Science (WoS) publications on mangrove ecotourism-related topics (Source: Authors using QGIS 3.28. Software, 2023)

This study additionally employed an evaluation of the number of documents and citations in institutions besides the countries/regions of origin to further investigate the geographical distribution of publications on mangrove ecotourism research. Interestingly, Asian universities in Malaysia, Thailand, China, Taiwan, and Indonesia contribute to the top ten institutions with the most publications on mangrove ecotourism issues in both the Scopus and WoS databases.

Universiti Malaya in Malaysia has the most publications on mangrove ecotourism in the Scopus database, with six documents. Meanwhile, the Chinese Academy of Sciences, China has the most publications on mangrove ecotourism-related issues in the WoS database, with nine documents. This finding is closely similar to an article from Liu and Li (2020), who argued that the Chinese Academy of Sciences, China, produced the most ecotourism research papers in general between 1990 and 2016, with 31 documents. Meanwhile, according to the Scopus and WoS databases, only a few institutions outside of Asia are ranked in the top ten institutions for publications on mangrove ecotourism, including: a) University of Plymouth and Plymouth Marine Laboratory, United Kingdom; b) Université Libre de Bruxelles, Belgium; and c) University of Johannesburg, South Africa. For more details, Table 7 shows the most prolific institutions in the world that publish academic documents on mangrove ecotourism topics.

Table 7. Institutions with the most publications on mangrove ecotourism topic (Source: Author's elaboration, 2023)

R	Scopus			Web of Science (WoS)				
	Institution	F	TC	C/F	Institution	F	TC	C/F
R1	Universiti Malaya	6	21	3,5	Chinese Academy of Sciences	9	333	37,0
R2	Prince of Songkla University	2	13	6,5	Bogor Agricultural University	7	326	46,6
R3	Universiti Putra Malaysia	2	12	6	Universiti Teknologi Malaysia	5	89	17,8
R4	University of Plymouth	2	7	3,5	Université Libre de Bruxelles	5	74	14,8
R5	Plymouth Marine Laboratory	2	7	3,5	University of Johannesburg	5	71	14,2
R6	Peking University Shenzhen Graduate School	2	4	2	Sun Yat-Sen University	5	66	13,2
R7	Lampung University	2	3	1,5	Universiti Kebangsaan Malaysia	7	52	7,4
R8	Central Police University Taiwan	2	3	1,5	Universiti Putra Malaya	5	43	8,6
R9	University of Riau	2	2	1	China University of Geosciences	5	21	4,2
R10	Gadjah Mada University	2	2	1	Diponegoro University	5	6	1,2

* R = Rank; F = Frequency (number of articles); TC = Total Citation (number of citations received by country); C/F = Average citations received by institution; C = Coverage (percentage coverage paper by a country in database)

In fact, Asia has the world's largest mangrove area, which is intrinsically associated with Asian institutions playing an influential role in publishing academic publications on mangrove ecotourism. South and Southeast Asia are home to 41.4% of the world's mangroves, covering approximately 8 million hectares (Kathiresan and Bingham, 2001; Spalding, 1997). To be more specific, major mangrove forests are currently found in India, Bangladesh, Malaysia, Myanmar, Vietnam, Thailand, the Philippines, and Indonesia, which have the world's largest mangrove cover, accounting for up to half of Asia's mangroves with 3.3 million ha (Alongi, 2015; Donato et al., 2011; Mursyid et al., 2021). This finding implies that the production of knowledge, evidenced by published scientific articles or documents, is closely related to the proximity to the object or locus of research. The geographical distribution of publications on mangrove ecotourism is strongly influenced by the geographical distribution of mangroves and mangrove ecosystems. Our finding also confirms Wardle et al.'s (2021) statement that the majority of the sites studied related to ecotourism issues in general are located in developing countries.

6. Most cited documents

This section explains the most frequently referenced documents on mangrove ecotourism identified in the Scopus and Web of Science (WoS) databases. Most cited documents are vital to debate to determine which scientific publications, based on total citations, are the most significant in the field of study. Surprisingly, there were significant differences between the most cited documents in Scopus and the WoS database on mangrove ecotourism publications. As a result, this study attempted to divide the most referenced documents into two categories rather than striving to incorporate them so that the distinctions discovered could be examined further. On the other hand, most of the top ten most-referenced publications in the Scopus and WoS databases are journal articles. Only one document has a different type, which is a book chapter.

Tables 8 and 9 list the top ten prominent documents in the mangrove ecotourism domains in terms of citations in the Scopus and WoS databases, respectively. Of the 10 most frequently cited documents in both the Scopus and WoS databases, only a few were older than 20 years. In general, they address the discussion on mangrove ecosystem utilisation, including ecotourism objectives and their correlation with environmental issues. The ten most frequently cited documents in the context of mangrove ecotourism studies use a variety of methods, including quantitative and qualitative literature reviews, participatory reflection and action, stakeholder analysis, Q methodology, participatory Multi-criteria Decision Analysis (MCDA), exploratory case studies, bibliometric analysis, spatial mapping, and social big data analysis. Furthermore, because only 8% of the documents in the two databases are similar in terms of content, only one of the top ten most referenced documents in both the Scopus and WoS databases is the same: a publication from Murdiyarsa et al. (2015), published in the Nature Climate Change journal.

The article generally examined the potential of Indonesia's ecosystem-service mangrove forests for climate change mitigation, one of which intersects with the commercial use of mangrove forests for tourism. This article is ranked second in the Scopus and WoS databases, with 411 and 324 total citations, respectively. The findings obviously suggest that the other nine most-referenced documents in the Scopus and WoS databases are substantially different.

Table 8. Most Cited Documents in the Scopus Database (Source: Authors elaboration based on Scopus database, 2023)

Rank	Authors (year)	Document Type	Source (SJR Rank)	Total Citation	Methodology	Results
R1	Kathiresan and Bingham (2001)	Book Chapter	Advances in Marine Biology (Q4)	1094	Descriptive analysis, Qualitative literature review	Mangroves play vital ecological roles. In addition to serving as an important fishery resource, mangroves may be developed as a source of high-value commercial items, including through ecotourism.
R2	Murdiyarto et al. (2015)	Article Journal	Nature Climate Change (Q1)	411	Conceptual article, Quantitative literature review	The conservation of carbon-rich mangroves in the Indonesian archipelago should be a high priority component of climate-change mitigation strategies. Some points were correlated with ecotourism initiatives.
R3	Praveena et al. (2008)	Article Journal	International Journal of Environmental Research (Q2)	57	Descriptive statistics, Geo-accumulation index	The Mengkaboong Lagoon mangrove habitat is essential for a variety of activities, including ecotourism. The Mengkabong mangrove sediment was unpolluted, according to geo-accumulation index calculations.
R4	Chong (2006)	Article Journal	Aquatic Ecosystem Health and Management (Q3)	55	Qualitative literature review	In Malaysia, mangrove habitats are frequently used in unsustainable practises, particularly when converted for agriculture, aquaculture, urban, and industrial development. On the other hand, ecotourism is considered a method of gaining public support for conservation and responsible utilisation.
R5	Satyanarayana et al. (2012)	Article Journal	Ambio (Q1)	52	Participatory reflection and action, Stakeholder analysis	Peri-urban and urban populations have varied usage of mangrove resources, knowledge of mangroves, and perceptions of ecosystem dynamics. Recent agenda items for ecotourism purposes in the Tanbi Wetland National Park (TWNP), Gambia, have gained positive responses from stakeholders.
R6	Thompson et al. (2017)	Article Journal	Journal of Sustainable Tourism (Q1)	47	Exploratory case study	The research shows that the normative approach, which serves as the framework for how ecotourism should be practiced, must be balanced with various understandings, motivations, and capacities of ecotourism entrepreneurs based on empirical conditions, as well as the effectiveness of the system of governance.
R7	Thompson and Friess (2019)	Article Journal	Journal of Environmental Management (Q1)	41	Participatory Multi-criteria Decision Analysis (MCDA)	Stakeholder preferences in managing and conserving mangrove ecosystems emphasize various approaches, including PES, ecotourism, biocharcoal, and NTFP enterprises, rather than a single approach such as PES alone.
R8	Ochoa-Gómez et al. (2019)	Article Journal	Forest Ecology and Management (Q1)	37	Quantitative assessment	Ecosystem Services (ESs) provided by mangrove wetlands in La Paz Bay, Mexico were identified in this study, including ecotourism and providing (fisheries) services.
R9	Salam et al. (2000)	Article Journal	Anatolia: An International Journal of Tourism and Hospitality Research (Q1)	37	Conceptual article, Qualitative literature review	Ecotourism has enormous potential to support the Sundarbans mangrove forest, a UNESCO World Heritage Site, achieve sustainability.
R10	Hugé et al. (2016)	Article Journal	Journal of Environmental Management (Q1)	35	Interviews, Semi-quantitative Q methodology	Mangrove management is viewed differently by different parties in Peninsular Malaysia. The three main discourses on mangrove management, namely a) the optimisation discourse; b) the 'change for the better' discourse, which focuses on increasingly participatory management and ecotourism; and c) the conservative 'business as usual' discourse, all have different perspectives on criteria regarding to: a) resource systems; b) resource units; and c) users.

Table 9. Most Cited Documents in the Web of Science (WoS) Database (Source: Authors elaboration based on Web of Science (Wos) database, 2023)

Rank	Authors (year)	Document Type	Source (SJR Rank)	Total Citation	Methodology	Results
R1	D'Amato et al. (2017)	Article Journal	Journal of Cleaner Production (Q1)	437	Bibliometric analysis	The geographical distributions of three concepts, namely Circular Economy (CE), Bioeconomy (BE), and Green Economy (GE), differ, with Chinese supremacy in CE research, a significant European BE focus, and a main global reach for GE. In terms of the social dimension, the Green Economy includes additional aspects at the local level (for example, ecotourism and education).
R2	Murdiyarto et al. (2015)	Article Journal	Nature Climate Change (Q1)	324	Conceptual article, Quantitative literature review	The conservation of carbon-rich mangroves in the Indonesian archipelago should be a high priority component of climate-change mitigation strategies. Some points were correlated with ecotourism initiatives.
R3	Airoldi et al. (2005)	Article Journal	Coastal Engineering (Q1)	267	Conceptual article, Qualitative literature review	The expansion of coastal defence structures may have a significant impact on regional species diversity by lowering isolation barriers, facilitating the spread of non-native species, and increasing habitat heterogeneity. In some cases, this may increase habitat complexity and foster diverse assemblages for ecotourism.

Rank	Authors (year)	Document Type	Source (SJR Rank)	Total Citation	Methodology	Results
R4	Hunter and Shaw (2007)	Article Journal	Tourism Management (Q1)	205	Conceptual article, Quantitative literature review	According to the ecological footprint as key indicator of sustainable tourism, some ecotourism products are claimed to have the ability to contribute positively to global resource conservation.
R5	Wang et al. (2006)	Article Journal	Environmental Monitoring and Assessment (Q2)	171	Spatial mapping, Quantitative assessment	Sanjiang Plain, as the inland freshwater wetland area, has remarkable scenery and a distinct cultural tradition that cannot be found in other locations. In this area, ecotourism may be an appropriate decision to boost the regional economy.
R6	Mbaiwa (2003)	Article Journal	Journal of Arid Environments (Q1)	160	Qualitative analysis	Because foreign ownership dominates the Okavango Delta (eco)tourism industry, it can be classified as enclave tourism or internal colonialism. Enclave tourism raises social and environmental concerns, such as operators' desire to maximize profits in a short period, even at the expense of ecology.
R7	Lu and Li (2006)	Article Journal	Aquaculture (Q1)	152	Qualitative literature review	It would be beneficial to exploit and conserve rice and fish farming as ecotourism resources in order to increase the income of farmers while also conserving and developing this important indigenous agro-culture.
R8	Tu et al. (2018)	Article Journal	Habitat International (Q1)	149	Field survey, Participatory rural appraisal	Huangshandian village has experienced many industrial developments since 2000, ranging from traditional agriculture to primary processing and eco-tourism. Traditional agricultural production is gradually losing its function, and industrial production, ecological culture, and other multifunctional rural values have emerged.
R9	Seaman (2007)	Article Journal	Hydrobiologia (Q1)	121	Conceptual article, Qualitative literature review	Artificial habitats in marine ecosystems can be applied to various objectives, including biological conservation and enhancement, as well as social and economic development, one of which is ecotourism.
R10	Kim et al. (2019)	Article Journal	Tourism Management (Q1)	83	Social big data analysis	Social big data analysis, such as using geo-referenced images from Flickr data, may contribute to improving protected area management by evaluating nature-based tourism in protected areas, including those used for ecotourism.

CONCLUSION

Mangrove ecotourism discussions in the Scopus database began in 1992, while those in the Web of Science (WoS) database started six years earlier, in 1986. The finding shows that the conceptual lens of ecotourism associated with mangrove ecosystems has existed concurrently since the concept's booming in the mid-1980s. Mangrove ecotourism research has increased over the last five years, culminating in 2021. Unlike previous studies that employed similar methods, the results of this study revealed that the share of documents regarding mangrove ecotourism in the Scopus and WoS databases was only eight percent. This means that the vast majority of scientific publications in the Scopus and WoS databases are separate from one another. In this sense, the WoS database has more unique documents and more sources than Scopus in the context of mangrove ecotourism publications.

The most cited documents in the Scopus and WoS databases on mangrove ecotourism publications were significantly different. Only one of the top ten most referenced documents in both the Scopus and WoS databases was the same. Subsequently, the majority of the top ten most-referenced publications in the Scopus and WoS databases are journal articles. Only one document has a different type, which is a book chapter. On the other hand, keywords intersecting environmental and sustainability issues dominated the top ten prominent keywords identified in both Scopus and WoS databases related to mangrove ecotourism publications. Conservation, biodiversity, protected areas, ecology, forestry, ecosystem services, and sustainable development were among the keywords. The keywords that most predominantly emerge in mangrove ecotourism publications are in line with the global discourse on the urgency of preserving mangrove ecosystems, which, according to several scientific papers and research, are deteriorating or even being harmed by human exploitation.

Furthermore, the Scopus database contains 930 authors who write about mangrove ecotourism, based on the findings. The number of authors is lower compared to the Web of Science (WoS) database, which has 1,776 authors. The vast majority of the authors (88.9% and 97.5%, respectively) have only one publication in both the Scopus and WoS databases. So far, Farid Dahdouh-Guebas is the most contributing researcher, with five Scopus publications and four WoS publications on mangrove ecotourism research domains. Meanwhile, in the context of geographical distribution, only six countries/regions have the most Scopus and WoS publications on mangrove ecotourism research. The six countries are spread across Asia, North America, and Europe, including: a) Indonesia; b) Malaysia; c) China; d) India; e) the United States; and f) the United Kingdom. In the Scopus database, Indonesia has the highest number of scientific documents regarding mangrove ecotourism, whereas China holds the most in the WoS database.

Subsequently, Universiti Malaya in Malaysia has the most publications, with six publications on mangrove ecotourism in the Scopus database. Meanwhile, the Chinese Academy of Sciences in China has the most publications in the WoS database on mangrove ecotourism-related concerns, with nine documents. Finally, this study has limitations because it only employed data from English-language scientific publications.

The authors suggest that future research on mangrove ecotourism using similar methods may accommodate academic works that are not limited to English-language publications.

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