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A Bibliometric Analysis of Marine and Coastal Tourism Development

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Abstract

This study aims to analyze the evolution, structure, and research trends in global marine and coastal tourism development between 2020 and 2025, as well as to identify key research themes, influential contributors, leading countries, and collaboration networks shaping the field. A descriptive bibliometric analysis was conducted using data retrieved from the Scopus database, combining quantitative performance analysis through the Bibliometrix R package with network visualization using VOSviewer, including the application of Lotka's Law to examine author productivity patterns. The results indicate a rapidly growing research domain, reflected in a strong annual growth rate of scientific publications and increasing global scholarly attention toward sustainable marine tourism development. The thematic analysis reveals dominant research focuses on sustainable development, ecotourism, marine environmental management, biodiversity conservation, climate change adaptation, and blue economy strategies. Collaboration patterns demonstrate a high level of international cooperation, emphasizing the interdisciplinary and transboundary nature of marine and coastal tourism issues. Overall, the findings provide a comprehensive overview of the intellectual structure and development trajectory of the field, offering valuable insights for researchers and policymakers to support evidence-based decision-making, strengthen global collaboration, and promote balanced strategies integrating tourism growth with long-term environmental sustainability.

Penelitian ini bertujuan untuk menganalisis evolusi, struktur, dan tren penelitian dalam pengembangan pariwisata bahari dan pesisir global antara tahun 2020 dan 2025, serta mengidentifikasi tema penelitian utama, kontributor berpengaruh, negara-negara terkemuka, dan jaringan kolaborasi yang membentuk bidang ini. Analisis bibliometrik deskriptif dilakukan menggunakan data dari basis data Scopus, yang menggabungkan analisis kinerja kuantitatif melalui paket R Bibliometrix dengan visualisasi jaringan menggunakan VOSviewer, termasuk penerapan Hukum Lotka untuk mengkaji pola produktivitas penulis. Hasil penelitian menunjukkan domain penelitian yang berkembang pesat, tecermin dari laju pertumbuhan tahunan publikasi ilmiah yang kuat dan meningkatnya perhatian akademis global terhadap pengembangan pariwisata bahari berkelanjutan. Analisis tematik mengungkapkan fokus penelitian yang dominan pada pembangunan berkelanjutan, ekowisata, pengelolaan lingkungan laut, konservasi keanekaragaman hayati, adaptasi perubahan iklim, dan strategi ekonomi biru. Pola kolaborasi menunjukkan tingkat kerja sama internasional yang tinggi, yang menekankan sifat lintas disiplin dan lintas batas dari isu-isu pariwisata bahari dan pesisir. Secara keseluruhan, temuan ini memberikan gambaran komprehensif mengenai struktur intelektual dan lintasan perkembangan bidang ini, serta menawarkan wawasan berharga bagi para peneliti dan pembuat kebijakan untuk mendukung pengambilan keputusan berbasis bukti, memperkuat kolaborasi global, dan mendorong strategi seimbang yang mengintegrasikan pertumbuhan pariwisata dengan keberlanjutan lingkungan jangka panjang.

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INTRODUCTION

Marine and coastal tourism has emerged as one of the fastest-growing sectors within the global tourism industry, contributing significantly to economic development, employment generation, and regional income diversification, particularly in coastal and island regions [1] (Hall, 2001). Coastal destinations attract millions of tourists annually due to their natural resources, including beaches, coral reefs, marine biodiversity, and cultural heritage landscapes, which serve as primary drivers of tourism competitiveness [2] (Dwyer & Kim, 2003). According to the United Nations World Tourism Organization, coastal and marine tourism represents a substantial share of global tourism activities and plays a vital role in supporting local economies and community livelihoods worldwide [3]. As tourism demand continues to expand, marine and coastal areas increasingly function as strategic economic assets within sustainable development agendas [4] (Becken, 2013).

The growing importance of marine tourism is closely linked to the concept of the blue economy promoted by the World Bank, which emphasizes the sustainable use of ocean resources to foster economic growth while maintaining ecological integrity. Within this framework, marine and coastal tourism has been recognized as a key sector capable of generating economic opportunities while encouraging conservation initiatives and environmental awareness [5] (Dimitrovski et al., 2021). However, rapid tourism expansion often creates complex trade-offs between economic benefits and environmental sustainability, as intensive tourism development may lead to coastal ecosystem degradation, habitat loss, biodiversity decline, pollution, and excessive pressure on fragile marine environments [6] (Mahendru et al., 2024).

Global environmental challenges further intensify these concerns. Climate change significantly affects coastal tourism systems through sea-level rise, coastal erosion, coral bleaching, and extreme weather events that threaten tourism infrastructure and natural attractions [7] (Gössling et al., 2012). Additionally, unplanned coastal development, over tourism, and weak governance structures have raised concerns regarding the long-term sustainability of marine tourism destinations [8] (Pathmanandakumar et al., 2021). These challenges highlight the necessity of integrating ecological conservation, community participation, and economic resilience into coastal tourism planning and management.

In response to these issues, academic research on marine and coastal tourism development has expanded rapidly over the past two decades, encompassing diverse themes such as sustainable tourism, coastal management, marine conservation, destination competitiveness, blue economy strategies, and community-based tourism [9] (Ringham & Miles, 2018). Scholars increasingly emphasize interdisciplinary approaches combining environmental science, economics, geography, and tourism studies to understand the interactions between tourism development and coastal ecosystems [10] (Kabil et al., 2021). Furthermore, global policy frameworks initiated by the United Nations Sustainable Development Goals (SDGs), particularly SDG 14 (Life Below Water) and SDG 8 (Decent Work and Economic Growth), have strengthened the relevance of sustainable marine tourism research within international development agendas [11].

Therefore, this study conducts a comprehensive bibliometric analysis to examine global research trends on marine and coastal tourism development. Specifically, the objectives of this study are: (1) to analyze annual scientific production and publication growth trends; (2) to identify the most influential authors, journals, and contributing countries; (3) to explore the conceptual structure of the field through keyword co-occurrence analysis; and (4) to map collaboration networks among researchers and countries. By providing a systematic overview of the scientific landscape, this study aims to offer valuable insights for researchers, policymakers, and tourism stakeholders seeking to promote sustainable marine and coastal tourism within the evolving blue economy framework.

METHOD

This study adopts a descriptive–retrospective bibliometric approach to systematically analyze the evolution of scientific research on marine and coastal tourism development. Bibliometric analysis enables the quantitative evaluation of scientific publications, identification of research trends, assessment of knowledge structures, and mapping of collaboration networks within a specific research domain. This

method is widely applied to explore the intellectual development of tourism studies and to provide objective insights into research productivity and thematic evolution over time [12] (Donthu et al., 2021).

Search Strategy and Data Source

A comprehensive literature search was conducted using the Scopus database, selected due to its extensive coverage of high-quality peer-reviewed journals and its suitability for bibliometric investigations [13] (Falagas et al., 2008). The search strategy was designed to capture the multidimensional nature of marine and coastal tourism research, integrating tourism, sustainability, coastal management, and blue economy perspectives. The search string was designed to capture a broad range of topics central to the field, incorporating terms related to management, key species, ecological concepts, and emerging paradigms: ("marine tourism" OR "coastal tourism" OR "marine and coastal tourism" OR "coastal tourism development" OR "maritime tourism" OR "blue tourism" OR "coastal destination" OR "marine ecotourism" OR "blue economy tourism"). The search was limited to publications published between 2020 and 2025 in order to capture recent global research developments and emerging trends in marine and coastal tourism studies. Only English-language journal articles were included to ensure analytical consistency and international comparability. The initial search yielded a dataset of publications which were subsequently screened and prepared for bibliometric analysis.

Data Analysis and Visualization

The retrieved bibliographic data were exported from Scopus in CSV format. The analysis was conducted using two primary tools:

1. Bibliometrix R Package (version 4.0.0): This analytical R-tool supported data preparation and descriptive analysis while generating core bibliometric metrics, including annual scientific output, average citation impact, and patterns of author productivity. The distribution of research productivity was examined using Lotka's Law [14] (Aria & Cuccurullo, 2017).
2. VOSviewer (version 1.6.20): This software was utilized to develop and visualize bibliometric network structures [15] (van Eck & Waltman, 2010). It was applied to generate:

• Co-authorship maps to explore research collaboration structures among authors and contributing countries.
• Keyword co-occurrence maps to examine the conceptual landscape of the field and detect leading research themes. Prior to visualization, keywords were standardized by combining singular and plural forms and integrating closely related concepts to improve mapping consistency.

RESULTS AND DISCUSSION

Figure 1. Summary of information overview from Rstudio

The general characteristics of the dataset presented in Figure 1 indicate a dynamic and rapidly growing research field in marine and coastal tourism development during the 2020–2025 period. The analysis includes 201 scientific publications from 96 academic sources contributed by 938 authors, reflecting broad scholarly participation and increasing academic engagement. The field demonstrates strong

expansion, evidenced by an annual growth rate of 31.54%, highlighting rising global awareness of sustainable marine tourism, coastal development, and blue economy initiatives. Authorship patterns reveal a highly collaborative research environment, with an average of 4.92 co-authors per document and an international co-authorship rate of 38.31%, emphasizing the global and interdisciplinary nature of the field. The presence of 896 author keywords indicates substantial thematic diversity, while citation performance supported by 32,761 references and an average of 11.49 citations per document demonstrates notable scientific impact. Furthermore, the average document age of 2.82 years confirms that marine and coastal tourism research represents a contemporary and actively developing domain characterized by increasing publication output, expanding collaboration networks, and evolving research themes.

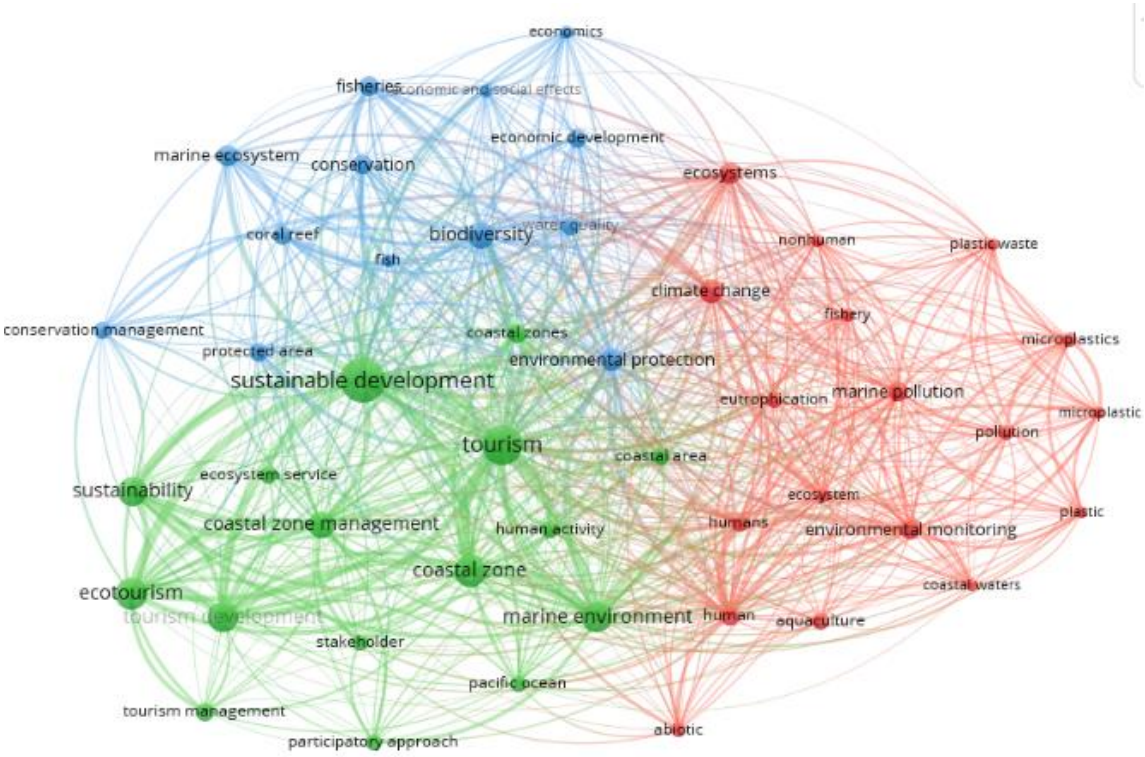

Figure 2. Main information about the bibliometric dataset on marine and coastal tourism development (2020-2025)

The keyword co-occurrence network visualization in Figure 2 reveals the conceptual structure and thematic development of global research on marine and coastal tourism. The analysis shows a highly interconnected research landscape where sustainability, tourism development, and marine environmental management emerge as central themes. Dominant keywords such as tourism, sustainable development, sustainability, and marine environment indicate that sustainability has become the primary paradigm guiding coastal tourism research. The network also highlights increasing scholarly attention to environmental challenges, including climate change, marine pollution, environmental protection, and water quality, reflecting growing global concern over ecological pressures in coastal areas. In addition, themes related to ecotourism, marine tourism, blue economy, and economic growth demonstrate the integration of tourism development with economic transformation and resource-based development strategies. The presence of regional terms, particularly Indonesia, suggests rising contributions from developing coastal nations. Overall, the dense connections among clusters illustrate an increasingly interdisciplinary field that integrates environmental, economic, and spatial planning perspectives, confirming that marine and coastal tourism research has evolved into a mature and rapidly expanding domain centered on sustainability and integrated coastal management.

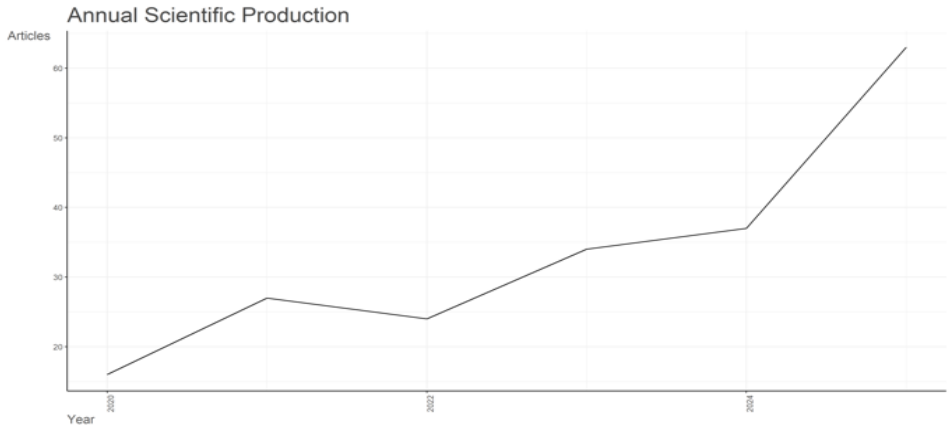

Figure 3. Annual scientific production in Marine and Coastal Tourism Development research (2020-2025)

The annual scientific production illustrated in Figure 3 shows a consistent upward trend in publications related to marine and coastal tourism development between 2020 and 2025. Beginning with a relatively modest number of publications in 2020, the volume of articles increased steadily over the subsequent years, despite a slight fluctuation around 2022. The most significant growth occurred toward the end of the observed period, with publications reaching their highest level in 2025. This sharp increase indicates a rapidly expanding research interest and highlights the growing global recognition of marine and coastal tourism as a strategic sector supporting sustainable economic development, blue economy initiatives, and coastal environmental management. The rising publication trend demonstrates the strengthening role of scientific research in addressing sustainability challenges and guiding evidence-based tourism development in coastal regions worldwide.

Keyword Co-occurrence and Thematic Analysis

The keyword co-occurrence network visualization presented in Figure 4 illustrates the conceptual structure and thematic composition of research on marine and coastal tourism development. The map reveals a highly interconnected knowledge structure, indicating strong relationships between tourism development, environmental protection, economic activities, and marine ecosystem sustainability.

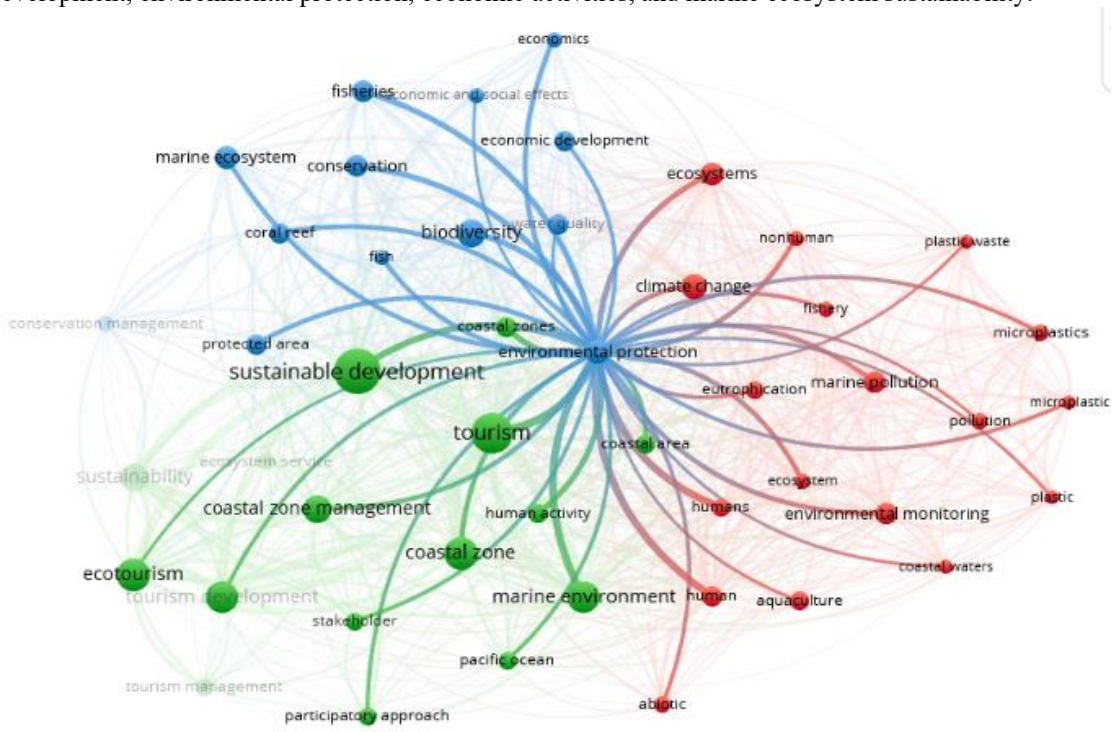

Figure 4. Map of keyword co-occurrence in marine and coastal development resource articles (2020-2025)

The analysis identifies several major thematic clusters:

Cluster 1 (Red): Environmental Pressures and Pollution Challenges: This cluster is dominated by keywords such as climate change, marine pollution, microplastics, plastic waste, and environmental monitoring. This cluster highlights increasing academic concern regarding environmental degradation and human-induced impacts on coastal ecosystems, emphasizing the urgency of conservation-based management approaches in tourism destinations.

Cluster 2 (Green): Sustainable Tourism and Coastal Management: characterized by terms including sustainable development, tourism, ecotourism, coastal zone management, and marine environment. This cluster reflects the growing integration of sustainability principles into tourism planning, where tourism development is aligned with ecosystem preservation and community-based management strategies.

Cluster 3 (Blue): Economic Development and Ecosystem Conservation: Keywords such as tourism, economic development, spatial planning, fisheries, blue growth, and coastal area define this cluster. It highlights the integration of tourism planning with marine resource utilization and coastal economic activities. Research in this area focuses on balancing tourism expansion with spatial management and long-term economic sustainability.

Overall, the simultaneous presence of tourism, environmental protection, biodiversity, and economic development keywords indicates that marine and coastal tourism research has evolved into an interdisciplinary field. Scholars increasingly seek to balance tourism growth with ecological resilience, highlighting sustainability as the central paradigm guiding contemporary marine and coastal tourism development research.

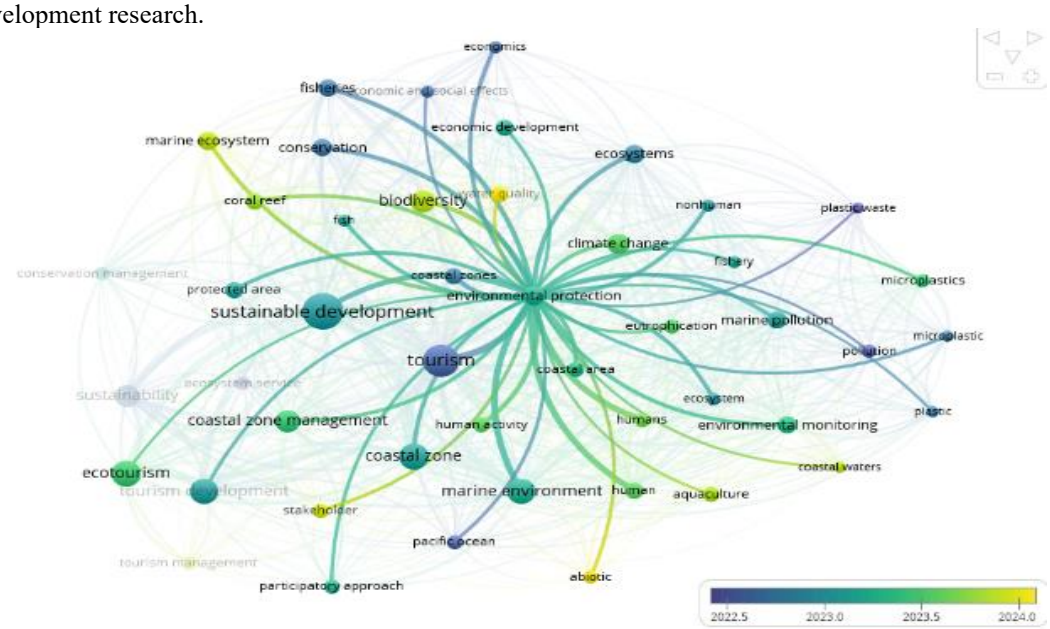

Figure 5. Overlay Visualization of Marine and Coastal Development

The figure 5 represents an overlay visualization in bibliometric analysis generated using VOSviewer, illustrating the network of frequently occurring terms in scientific publications related to coastal environments, conservation, and marine tourism. Each node represents a keyword or concept, where the size indicates its frequency of occurrence, and the connecting lines reflect co-occurrence relationships, with thicker lines signifying stronger connections. The color gradient in the overlay visualization indicates the temporal evolution of research topics, ranging from darker tones (earlier studies) to brighter colors (more recent topics). Terms such as “environmental monitoring,” “nature conservation,” and “protected area” appear in darker shades, suggesting they are well-established research themes, while brighter-colored terms like “tourist destination,” “marine tourism,” “participatory approach,” and “Indonesia” indicate emerging or more recent areas of focus. The central cluster is dominated by “biodiversity,” which is strongly connected to other concepts such as “protected area,” “beach,” and “marine tourism,” highlighting its key role in linking conservation and tourism studies. Additionally, the presence of “participatory approach” suggests a growing emphasis on community involvement in environmental management, while the inclusion of “Indonesia” reflects a geographical concentration of research. Overall, this visualization demonstrates a shift in research trends from traditional conservation-focused studies toward a more integrated approach that combines biodiversity protection with sustainable tourism development and stakeholder participation.

Countries Most Citation

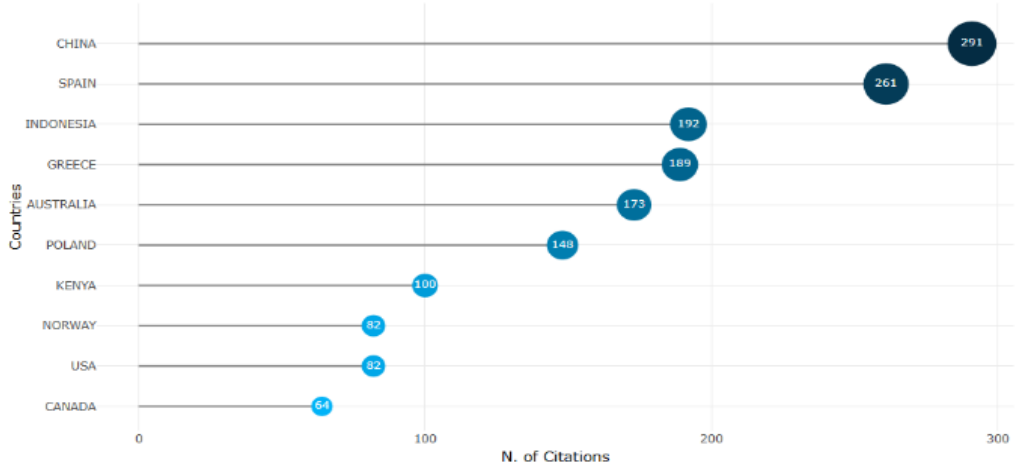

Figure 6. Countries with the most citations in marine and coastal tourism development (2020-2025)

The analysis of most cited countries in Figure 6, illustrates the global distribution of scientific influence in marine and coastal tourism research based on citation impact. The visualization highlights significant disparities in citation performance among countries, reflecting differences in research productivity, international visibility, and scholarly influence.

China emerges as the most cited country, accumulating 291 citations, indicating its dominant role in shaping academic discourse and contributing substantially to scientific development in the field. Spain follows closely with 261 citations, demonstrating strong European leadership and sustained research engagement in coastal and marine tourism studies. Indonesia ranks third with 192 citations, underscoring its growing importance as both a major research contributor and a key case-study region due to its extensive coastal resources and tourism potential.

Other countries such as Greece (189 citations) and Australia (173 citations) also exhibit strong citation performance, reflecting their established traditions in marine environmental management and sustainable tourism research. Poland (148 citations) and Kenya (100 citations) represent emerging contributors, showing increasing participation from diverse geographical regions. Meanwhile, Norway and the United States each record 82 citations, while Canada contributes 64 citations, indicating continued but comparatively moderate citation influence within the dataset.

Overall, the distribution reveals a globally interconnected research landscape where both developed and developing countries play important roles in advancing marine and coastal tourism scholarship. The prominence of Asian and European countries suggests shifting research leadership toward regions directly facing coastal sustainability challenges. The citation pattern also indicates that scientific influence is no longer concentrated solely in traditional research powers but increasingly shared across countries with strong environmental, economic, and tourism interests, reinforcing the global relevance of sustainable marine and coastal development research.

CONCLUSION AND RECOMMENDATION

This bibliometric analysis provides a comprehensive and systematic overview of the development of global research on marine and coastal tourism during the period 2020–2025. The study successfully achieved its objectives by revealing a rapidly expanding research field characterized by a strong growth trend, increasing scientific output, and rising global academic attention toward sustainable marine tourism and coastal development. The findings indicate the emergence of a highly collaborative international research community, demonstrated by extensive multi-authorship patterns and significant cross-country cooperation, reflecting the interdisciplinary nature of marine and coastal tourism studies.

The conceptual structure identified through keyword co-occurrence analysis highlights the evolution of research themes within the field. While tourism development and marine environmental

management remain core topics, the research landscape has expanded to integrate broader sustainability perspectives, including ecotourism, biodiversity conservation, spatial planning, economic development, and blue economy strategies. The growing prominence of concepts such as sustainability, sustainable development, and ecosystem-based management signals a clear transition toward integrated and solution-oriented research aimed at balancing tourism growth with environmental protection and climate resilience. At the same time, the analysis reveals an ongoing scholarly challenge in reconciling economic expansion with ecological conservation, which continues to shape research agendas and policy discussions.

The results of this study offer important implications for multiple stakeholders. For researchers, the identification of dominant themes, collaboration networks, and emerging research directions provides guidance for future investigations and potential international partnerships. For policymakers and development planners, the findings highlight priority areas requiring strategic investment, particularly in sustainable coastal management and environmentally responsible tourism development. Overall, this study confirms that marine and coastal tourism development has evolved into a dynamic, globally relevant research domain, emphasizing the necessity of interdisciplinary collaboration and integrated governance approaches to ensure sustainable ocean-based tourism in the future.

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