

Current Trends and Developments in Marine Tourism Research: A Decade-Long Literature Analysis

Rahayu Sulistiowati¹, Yulianto², Samsul Bakri³, Maulana Mukhlis⁴, Dimas Adi Saputra⁵

{rahayu.sulistiowati@fisip.unila.ac.id¹, yulianto@fisip.unila.ac.id², Samsul.bakri@fp.unila.ac.id³,
Maulana.mukhlis@fisip.unila.ac.id⁴, dimas.adi@umn.ac.id⁵}

University of Lampung^{1,2,3,4}, Multimedia Nusantara University⁵

Abstract. This article presents an analysis of the literature over the past decade in marine ecotourism research. Using data from 543 papers indexed in Scopus, we evaluated research impact and trends as well as connections between topics. Through bibliometric analysis, it is known how research trends related to marine ecotourism. The results showed that there was an increase in paper production to the highest peak in 2019, then decreased. Key themes such as "marine ecotourism" and "sustainable tourism" reflect the research focus on sustainability and environmental preservation. Connectedness analysis shows clusters that illustrate the central role of "ecotourism" in linking other topics, such as marine tourism and conservation. Theme analysis identifies basic themes that remain relevant, niche themes with a specific focus, themes that are emerging or declining, and motor themes that influence the development of marine ecotourism. Overall, this article provides in-depth insights into the evolution of marine ecotourism research, paving the way for further understanding of the inter-topic interactions and dynamics of research developments in marine ecotourism.

Keywords: marine ecotourism, ecotourism, sustainable tourism, bibliometrics

1 Introduction

Marine ecotourism is a type of tourism that focuses on the conservation and development of marine natural resources [1]. This usually occurs in coastal areas, including marine national parks, and involves activities such as snorkeling, diving, and whale watching [2]. The main purpose of marine ecotourism is to raise awareness about the sustainability of marine natural resources as well as generate income that helps the maintenance and development of marine national parks [3]. In addition, marine ecotourism can also help reduce conflicts between human activities and the sustainability of the marine environment [4]. Marine ecotourism is one of the best ways to promote marine conservation while providing opportunities for people to enjoy the beauty and uniqueness of marine ecosystems [5]. Thus, marine ecotourism is a win-win solution that can be a source of income for local communities and help preserve the marine environment [6].

Marine ecotourism can also help reduce pressure on marine resources related to industrial activities, such as mining, harvesting marine products, and infrastructure development [7]. By providing alternative sources of income based on tourism, local communities will be more

encouraged to conserve marine resources in the region [8]. In some places, marine ecotourism has also been proven to be able to improve the quality of life of local communities by providing decent jobs and increasing community income [9]. In addition, marine ecotourism can also contribute to infrastructure development in coastal areas, such as road construction and other public facilities [10].

Marine ecotourism is a topic that is of concern to many researchers in various parts of the world. Some recent research on marine ecotourism has focused on various aspects, such as:

1. Impact of marine ecotourism on marine ecosystems: This study aims to evaluate the impact of marine ecotourism on marine ecosystems, such as habitat destruction and water pollution. This research can provide useful information for marine ecotourism managers to ensure that the activities carried out do not harm the marine environment [11].
2. Economic benefits of marine ecotourism for local communities: This study aims to evaluate how much economic benefits marine ecotourism provides to local communities, including jobs created and increased community income [12].
3. The role of marine ecotourism in marine conservation: This study aims to evaluate how big the role of marine ecotourism is in raising awareness about the sustainability of marine resources and reducing pressure on marine resources caused by industrial activities [13].
4. Marine ecotourism management policy: This study aims to evaluate effective marine ecotourism management policies, including determining appropriate capacity limits and developing environmentally friendly operational standards [14].

Thus, there has been a lot of research that has been done on marine ecotourism, which aims to increase understanding of the topic and provide the best solutions for the responsible management and development of marine ecotourism. Although there has been a lot of research done on marine ecotourism, there are still some research gaps that need attention. Here are some examples of research gaps in marine ecotourism:

1. Absence of long-term studies on the impact of marine ecotourism on marine ecosystems: Most existing research focuses only on the short-term impacts of marine ecotourism [15].
2. Lack of research on how marine ecotourism can be integrated with other activities in coastal areas: Marine ecotourism is not the only activity that occurs in coastal areas [15].
3. Lack of research on how marine ecotourism can be accessed by all levels of society: Marine ecotourism is often considered an activity that is only accessed by certain groups [16].
4. Lack of research on how marine ecotourism can be integrated with sustainable development: Marine ecotourism can provide benefits for sustainable development in coastal areas, but more research is needed on how marine ecotourism can be integrated with sustainable development effectively [17].

Thus, there are still some research gaps on marine ecotourism that need to be considered to broaden our understanding of the topic. One effort to find out these gaps is to conduct

bibliometric model research that is useful for understanding research trends on a topic. Using a bibliometric research model, we can evaluate the number of scientific publications published on a topic, as well as analyze the characteristics of those publications, such as the journal in which they were published, the author's country of origin, and the keywords used. Bibliometric research models can provide useful information for researchers and policymakers who want to understand research trends on a topic, as well as identify research gaps that need attention. Thus, bibliometric research models can provide useful information for researchers and policymakers who want to understand research trends regarding marine ecotourism, as well as identify research gaps that need attention. In addition, bibliometric research models can also provide information about countries or institutions that have the highest research activities related to marine ecotourism, as well as journals where publications are most often used to write about marine ecotourism.

2 Methodology

This study uses bibliometric analysis based on two methods, namely systematic and explicit [18] or mind mapping that emphasizes the limits of knowledge [19]. This study adopted a five-stage method [19] [20].

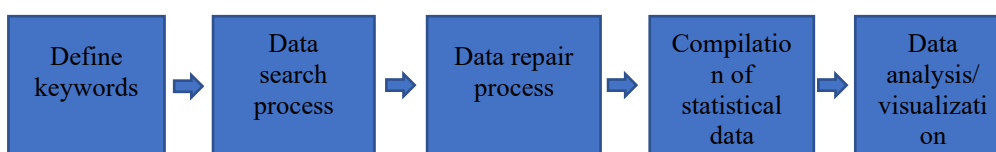


Fig. 1. Stages of the Bibliometric Method

A literature search from 2014-2023 using the keyword "Marine Ecotourism" comes from scopus data. Scopus data was chosen as the largest database that is trusted and has a wide literature scale throughout the world.

3 Results and Discussion

3.1 Matrix Analysis

It is known the results of searching literature related to marine ecotourism over the past decade. From the data table below, we can see that during that period, 543 papers have been published that examine the topic of marine ecotourism.

Table 1. Papers that examine the topic of marine ecotourism.

Source	Scopus
Papers	543
Citations	6054

Years	10
Cites_Year	672.67
Cites_Paper	11.15
Cites_Author	1899.85
Papers_Author	182.12.00
Authors_Paper	04.02
h_index	37
g_index	53
hc_index	36
hI_index	0,345833333
hI_norm	18
AWCR	1583.82

The total number of citations received by these papers reached 6054, with an average of 672.67 citations per year, indicating significant interest in this field. The average citation per paper is around 11.15, which indicates that these papers have had a mixed impact in the scientific community. In addition, this data also provides insight into author productivity and collaboration. An average of 182.12 papers were published by each author, with 4.02 authors contributing to each paper. This illustrates the level of cooperation in research on marine ecotourism. An H index (h-index) of 37 and a G index (g-index) of 53 indicate the impact of research in this field. The HC index of 36, which measures impact taking into account the authors' collaboration, also provides an idea of significant influence in the scientific community.

In addition, an E index (e-index) of 30.85 reflects the combination of the H index and the number of citations, providing additional perspective on the impact of the study. The data also includes several other metrics, such as an AWCR (Average Weighted Citation Rate) of 1583.82 and a AW_index of 39.80, which describe the average citation rate in this literature source. With these metrics, we can gain a deeper understanding of the distribution, impact, and relevance of marine ecotourism-related research within the scientific community.

In addition, the production trend of papers related to marine ecotourism over the past decade reflects the dynamics in research in this field. Starting with 16 papers in 2014, production has consistently increased until it reached its highest peak in 2019 with 74 papers. This may reflect increased interest and attention to marine ecotourism-related issues. However, after reaching the peak, paper production has declined, with 46 papers in 2023. This may reflect changes in research trends, shifts in focus, or other factors that affect research productivity in this topic. Further analysis may be required to understand the factors underlying changes in paper production as well as their impact on the development of science in the field of marine ecotourism.

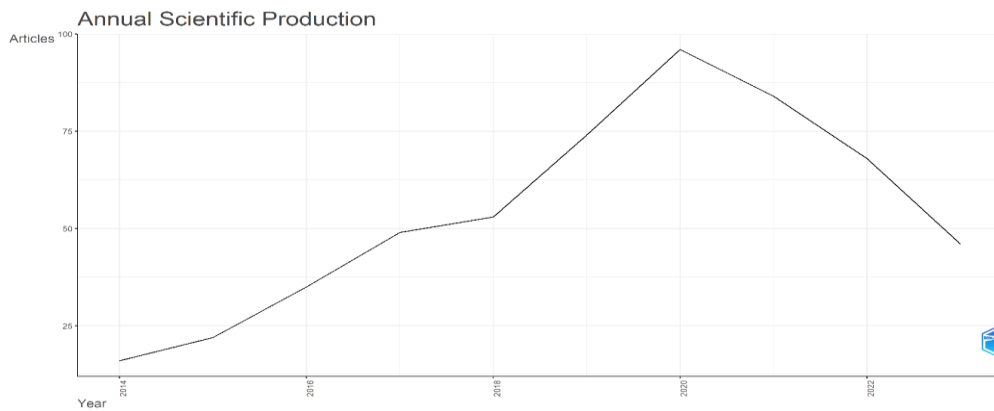


Fig. 1. The production trend of papers related to marine ecotourism over the past decade

In research on marine ecotourism, several sources have proven to be very relevant in their contribution. In particular, the "IOP CONFERENCE SERIES: EARTH AND ENVIRONMENTAL SCIENCE" was ranked at the top with 50 related papers, showing a significant impact in the dissemination of knowledge in this domain. "MARINE POLICY" and "OCEAN AND COASTAL MANAGEMENT" have the same number of papers, which is 31, and are in second place. Sources such as "JOURNAL OF SUSTAINABLE TOURISM" with 21 papers, "JOURNAL OF ECOTOURISM" with 18 papers, "FRONTIERS IN MARINE SCIENCE" and "SUSTAINABILITY (SWITZERLAND)" with 15 papers each, and "AQUATIC CONSERVATION: MARINE AND FRESHWATER ECOSYSTEMS" with 12 papers, also have significant contributions in research related to marine ecotourism. "TOURISM MANAGEMENT" and "GEOJOURNAL OF TOURISM AND GEOSITES" took ninth and tenth place with 9 and 8 papers respectively. These results reflect a high level of interest in marine ecotourism research as well as the diversity of sources used to disseminate knowledge in this field.

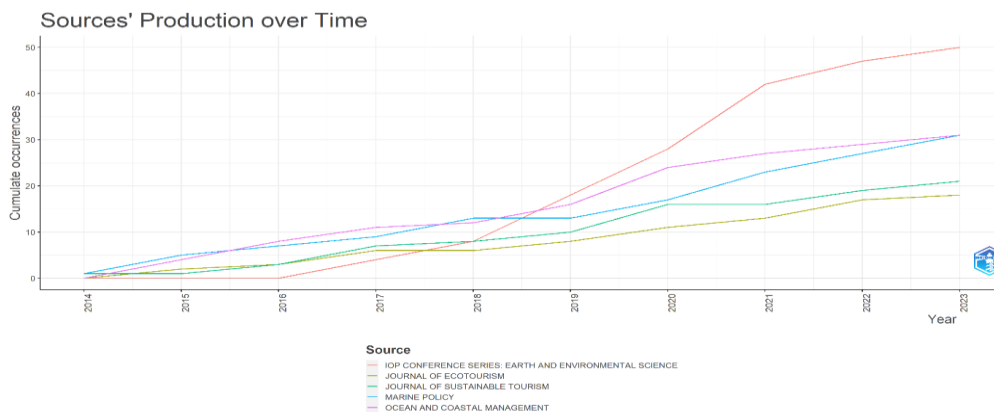


Fig. 2. The tren of sources production over time

3.2 Topic Analysis

The cloudword data illustrates the most relevant topics in marine ecotourism research. "Marine ecotourism" became the most dominant term with a frequency of 160, indicating a major focus on research related to marine ecotourism. Furthermore, "marine protected" and "marine tourism" emerged as important topics in the literature, with 99 and 85 occurrences respectively, indicating concern for the protection of marine ecosystems and the sustainable development of tourism. "Coral reefs" receive significant attention (72) because coral reef ecosystems are often a major destination in marine ecotourism. The topic of "wildlife tourism" highlights aspects of tourism involving wildlife in marine habitats such as sharks and sea turtles (58). In addition, "sustainable tourism" and "sustainable development" emphasize the importance of sustainable approaches in marine tourism management. Other themes such as "whale sharks," "marine parks," "carrying capacity," and "whale sharks" also reflect interest in research on specific species and aspects of sustainability. This data reflects the main focus in marine ecotourism research on environmental conservation, sustainability, and tourist interaction with marine wildlife, as well as efforts to integrate sustainable development within the marine tourism sector. Further analysis can be used to understand trends and shifts in research focus within this field.



Fig. 3. The most relevant topics in marine ecotourism research

Marine ecotourism research trends from year to year illustrate an evolution in academic focus and interest that reflects changes in the dynamics of the marine environment, as well as technological developments and approaches in this field.

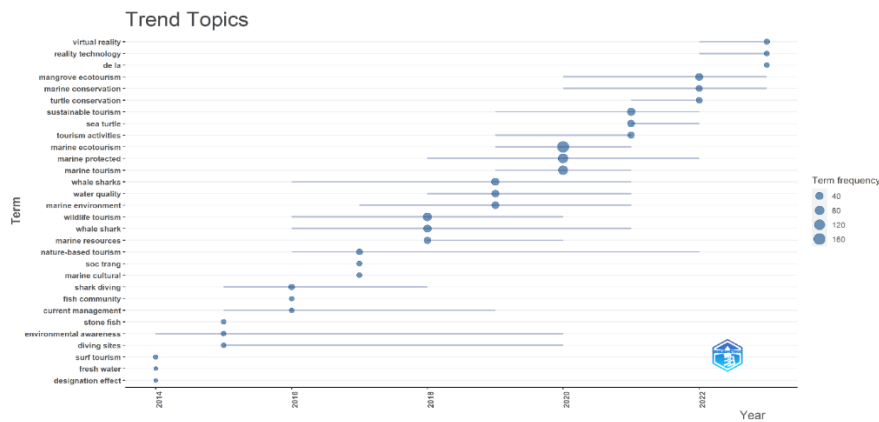


Fig. 4. The research trends in marine ecotourism

At the beginning of the period, in 2014, there were several topics such as "surf tourism," "designation effect," and "fresh water" that reflected early interest in marine ecotourism research. However, the frequency of these topics later decreased and was only relevant in that year, indicating a shift in research interest. In 2015, the topics of "stone fish" and "diving sites" began to emerge, reflecting interest in certain aspects related to marine ecotourism and dive sites. In addition, "shark diving" and "current management" also began to emerge in the same year, reflecting increased interest in shark fishing and other management factors.

The year 2016 marked an important shift in research trends. The rise of topics such as "fish community," "wildlife tourism," and "whale shark" reflects a growing interest in marine ecotourism research and wildlife conservation efforts. Attention to whale sharks, demonstrated by "whale sharks," continued to increase until it peaked in 2021. Over the following years, research focused more on "marine ecotourism" and related key topics such as "marine protected" and "marine tourism," which dominated in the literature. "Sustainable tourism" also started to get attention in 2019 and is becoming increasingly relevant into 2022.

The increased interest in "sea turtle" and "turtle conservation" in 2021 reflects special attention to sea turtle conservation. Furthermore, in 2022 and 2023, "mangrove ecotourism" and "marine conservation" are starting to receive attention, highlighting the important role of marine ecotourism in maintaining mangrove forest ecosystems and marine conservation as a whole. In addition to these topics, there are also developments in research related to new technologies such as "virtual reality" and "reality technology" in 2022 and 2023, reflecting efforts to integrate new technologies in marine tourism experiences.

Overall, research trends show a shift in focus from more general and generally less specific initial topics to more specialized topics closely related to marine ecotourism. In recent years, there has been a significant increase in marine ecotourism research, with a strong emphasis on sustainability, environmental conservation, and responsible management. In recent years, marine ecotourism has taken center stage in scientific research and management practices of the marine environment.

Furthermore, the relationship between topics in marine ecotourism research can be further investigated by considering the interaction matrix between these nodes. Interaction matrices can provide more detailed insights into how those topics relate to each other.

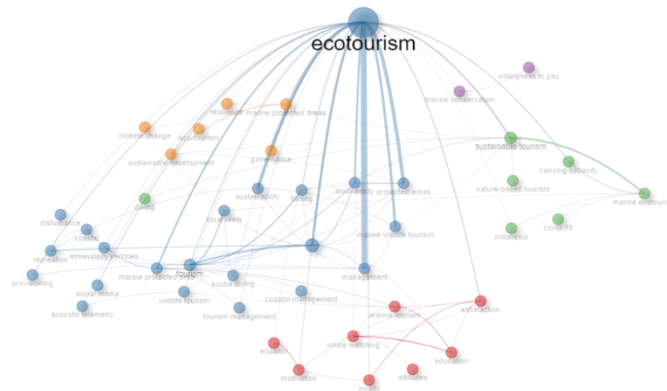


Fig. 5. The relationships and connections of marine ecotourism researches

In the context of marine ecotourism research, the relationships and connections between these topics are crucial. "Ecotourism" seems to be the central topic that connects many other topics in the network. The connectedness data between nodes in various clusters focused on marine ecotourism provides valuable insight into the role and interconnectedness of each topic in this domain. It is known that there are 5 clusters formed in this connection.

1. Cluster 1

In Cluster 1, which includes topics such as "marine tourism," "whale watching," and "satisfaction," it is seen that "whale watching" plays a strong central role in connecting other topics in the cluster. This may indicate that whale watching in the context of marine tourism is a topic that receives significant attention. "Marine tourism" and "satisfaction" also have a significant impact in this cluster. Therefore, Cluster 1 tends to focus on aspects of marine tourism satisfaction and experience that involve observing marine animals.

2. Cluster 2

Cluster 2 covers topics such as "ecotourism," "conservation," "tourism," and more. "Ecotourism" has a dominant impact in this cluster, indicating that marine ecotourism has a major role in connecting and influencing other topics in this cluster. "Scuba diving" also plays a significant role in the interconnectedness of these topics. This cluster tends to focus more on aspects of environmental conservation and sustainability in marine ecotourism.

3. Cluster 3

Cluster 3 covers topics such as "sustainable tourism," "marine ecotourism," "covid-19," and more. "Sustainable tourism" dominates this cluster in terms of influence, demonstrating its central role in connecting other topics. "Marine ecotourism" also has a significant impact. The cluster reflects an interest in the sustainable management and development of marine ecotourism and the response to changes such as the COVID-19 pandemic.

4. Cluster 4 dan 5

Cluster 4 covers the topic "marine conservation" with the highest PageRank value in this cluster, indicating that this topic has an authority role in the context of marine conservation. Cluster 5 covers the topic of "marine protected areas" which has a central role and authority in connecting other topics in this cluster. Cluster 6 covers a wide range of topics with a relatively lower impact in linkages between topics. In these three clusters, the emphasis seems to be more on aspects of conservation and conservation of marine resources.

Overall, this connectedness analysis provides a better understanding of the relationship between topics in marine ecotourism. By highlighting the central role, impact, and authority of each topic in these clusters, we can see how the topics relate to each other in the development of sustainable marine ecotourism practices and the preservation of the marine environment.

From the results of this connection, it can be identified how the themes that appear besides that the density of each theme that appears can also be identified. You can understand further by looking at the picture below which indicates various previous research themes related to marine ecotourism.

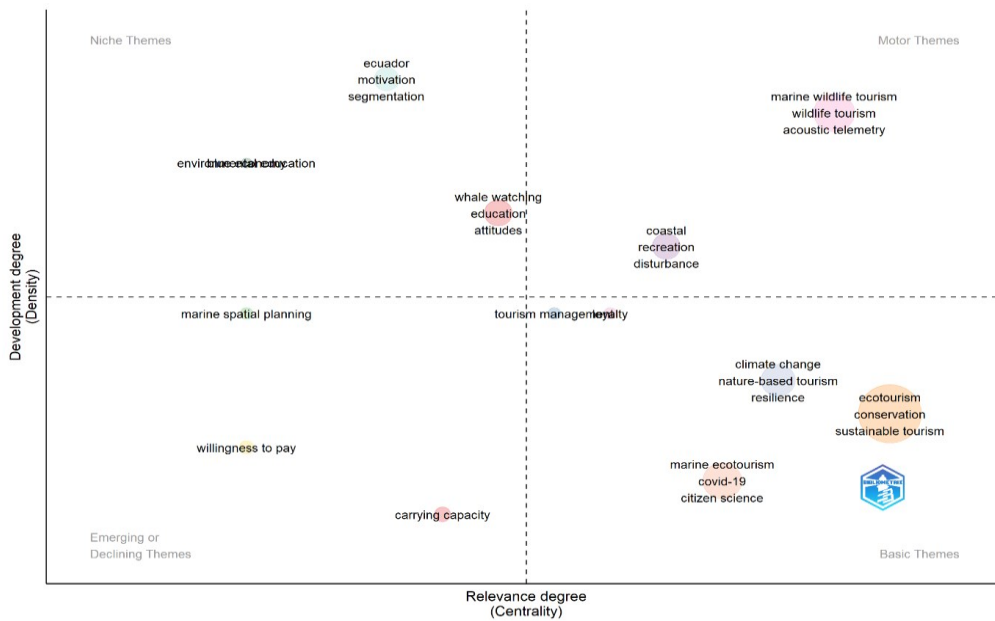


Fig. 6. Density and centrality marine ecotourism researches

Analysis of themes in the context of marine ecotourism, along with their grouping into categories such as basic themes, niche themes, emerging or declining themes, and motor themes, provides a more in-depth picture of the focus and development of research in marine ecotourism.

1. Basic Themes

Basic themes such as "Climate Change," "Ecotourism," "Marine Ecotourism," and "Tourism Management" are at the core of marine ecotourism research. The density of these themes may be high due to their strong importance and relevance in the understanding and development of marine ecotourism practices. This indicates that aspects of sustainability, marine ecotourism management, and climate change impacts are the main focus in marine ecotourism research.

2. Niche Themes

Niche themes such as "Blue Economy," "Ecuador," "Environmental Education," and "Whale Watching" have more specific or limited relevance in the domain of marine ecotourism. The density of these themes may be lower due to a narrower focus, but they still play a significant role in certain contexts. These themes may reflect local or special interests in marine ecotourism.

3. Emerging or Declining Themes

Emerging or declining themes such as "Carrying Capacity," "Marine Spatial Planning," and "Willingness to Pay" indicate changes in their level of relevance. The density of these themes may vary according to current research trends. Research on carrying capacity, ocean spatial planning, and willingness to pay may reflect changes in research focus in marine ecotourism.

4. Motor Themes

Motor themes such as "Coastal" and "Marine Wildlife Tourism" may have a significant influence in driving the development of marine ecotourism. The density of these themes can vary according to their role in the development of marine ecotourism. These themes may reflect the extent to which coastal aspects and marine wildlife tourism play a key role in the industry.

Overall, the analysis of marine ecotourism themes and their grouping into these categories provides insight into the diverse focus of research and developments in marine ecotourism. It also illustrates how such topics may experience changes in their level of relevance over time, reflecting the dynamics of research in marine ecotourism.

4 Conclusion

In the matrix analysis, we can see that the number of publications related to marine ecotourism reached 543 with 6054 citations. These data show that marine ecotourism is an important topic in the scientific literature, with a significant degree of interest. Analysis of research themes and trends over the past decade provides a deeper perspective on the evolution of academic interest in marine ecotourism. Key themes such as "marine ecotourism," "marine protected," "sustainable tourism," and "coral reefs" reflect strong attention to sustainability, environmental preservation, and sustainability aspects in marine tourism development. In addition, other themes such as "whale shark," "marine conservation," and "sea turtle" show increased interest in the conservation of marine species and ecosystems. This data reflects the extent to which researchers have focused on these aspects in an effort to safeguard the marine environment and develop responsible tourism practices.

We also see how research trends have changed over time. Marine ecotourism research has undergone a shift in focus, from a more general initial topic to a more specialized topic. This reflects changes in the dynamics of the marine environment, as well as technological developments and approaches in this field. These trends reflect responses to environmental issues and changes in consumer behavior that affect the development of marine ecotourism practices. In addition, an analysis of the connectedness between topics reveals that "ecotourism" is a central topic that connects many other topics in the network. The clusters depict how these topics are interrelated and support the sustainable development of marine ecotourism. Thus, this connectedness analysis helps us understand the relationship between topics and the extent to which they work together in the development of sustainable marine tourism practices.

Finally, analysis of marine ecotourism themes helps us understand the distribution of research focus in this field. Basic themes such as "Climate Change," "Ecotourism," "Marine Ecotourism," and "Tourism Management" are at the core of marine ecotourism research. Niche themes, such as "Blue Economy" and "Environmental Education," show a more specific focus. Themes that emerge or decline reflect changes in their relevance over time. Motor themes such as "Coastal" and "Marine Wildlife Tourism" have an influence in driving the development of marine ecotourism. Overall, the analysis of these themes provides an overview of the diversity of research focuses in marine ecotourism and changes in research trends over time.

Reference

- [1] Y. A. A. A. (. Omar, Pengaruh Social Media, Customer Experience dan Servicescape Terhadap Revisit Intention Pada Objek Wisata Bahari (Studi Kasus Pada Pantai Akkarena, Makassar), Makassar: Skripsi thesis, Universitas Hasanuddin, 2021.
- [2] R. Hilborn, „Introduction to Marine Managed Areas,“ *Advances in Marine Biology*, 2014.
- [3] M. J. A. C.-R. a. M. L. P.-C. Maestro, „Analysis of Marine Protected Area Management: The Marine Park of the Azores (Portugal),“ *Marine Policy*, 2020.
- [4] A. McQuatters-Gollop, „Marine Conservation,“ *Japanese Marine Life*, 2020.
- [5] K. A. a. M. H. Alexander, „The Human Side of Marine Ecosystem-Based Management (EBM): ‘Sectoral Interplay’ as a Challenge to Implementing EBM,“ *Marine Policy*, 2019.
- [6] T. R. Walker, „Green Marine: An Environmental Program to Establish Sustainability in Marine Transportation,“ *Marine Pollution Bulletin*, 2016.
- [7] N. Kiji, „Human Resource Development Policies in Japan Marine United,“ *Marine Engineering*, 2021.
- [8] M. d. J. S. Cruz, Ecoturismo y Desarrollo Local En El Sureste Mexicano. Una Mirada Con Elementos de La Economía Institucional a Dos Estudios de Caso = Ecoturism and Local Development in the Southeast Mexican. A Look with Elements of the Institutional Economy to Two Studie, Polígonos: Revista de Geografía. University of Leon, 2018.
- [9] Muslim, „Communication Strategy for the Development of Almous Ecoturism in the Island of the Kelapa Island,“ *Jhss (Journal of Humanities and Social Studies)*, 2021.
- [10] K. Watanabe, „High Operation Capable Marine Dual Fuel Engine with LNG,“ *Journal of The Japan Institute of Marine Engineering*, 2015.

- [11] J. P. B. R. S. a. K. D. L. Morton, *Disease Can Shape Marine Ecosystems, Marine Disease Ecology*.: Oxford University Press, 2020.
- [12] Č. a. O. W. Peter, „Ecotourism Potential and His Sustainable Development Oportunities in the Border Region between Slovakia and Poland,“ *European Journal of Sustainable Development*, 2018.
- [13] L. a. T. V. VYHOVSKYI, *Ecotourism as a Means of Formation of Ecological Consciousness and Culture of Personality*, University Scientific Notes: Leonid Yuzkov Khmelnytskyi University of Management and Law, 2021.
- [14] A. K. L. a. B. B. Terry, “The Impact of the Marine and Coastal Access Act (2009) on Welsh Inshore Fisheries and Marine Management.”, Elsevier BV.: *Marine Policy*, 2019.
- [15] H. Jayasiri, *Marine Debris, Marine Pollution and Climate Change*.: CRC Press., 2017.
- [16] J. a. A. K. Zaucha, *Engagement of Stakeholders in the Marine/Maritime Spatial Planning Process*, Elsevier BV: *Marine Policy*, 2021.
- [17] A. M. A. a. B. B. Costa, „Millennials’ Trends in Luxury Marketing: The Ecotourism,“ rev. *Iberian Conference on Information Systems and Technologies*, CISTI. IEEE, 2019.
- [18] J. A. Garza-Reyes, „Lean and Green—a Systematic Review of the State of the Art Literature,“ *Journal of Cleaner Production*, 2015.
- [19] D. a. D. T. Denyer, *Producing a Systematic Review*, The SAGE Handbook of Organizational Research Methods, 2009.
- [20] I. N. I. a. F. J. Setyaningsih, „Bibliometric Analysis of the Term’green Manufacturing,“ *International Journal of*, 2019.