

A Bibliometric Analysis of Marine Tourism

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Abstract

This study is motivated by the many phenomena that occur in marine tourism. Starting from protected marine areas, plastic waste that pollutes the marine environment, and other phenomena caused by marine tourism. Many studies that examine this phenomenon cultivate motivation to study all phenomena that exist in marine tourism. The purpose of this study is to determine research trends related to marine tourism using bibliometric analysis as a research method. The data was obtained through Scopus with the initial data amount of 1237 to 978 documents after going through the filtering process. The document is downloaded via the RIS file and matrix analysis is performed using Publish or Perish. Data mapping uses Vos Viewer software which is divided into four parts, namely Network Visualization, Overlay Visualization, Density Visualization, and author relationships based on Overlay Visualization. The results show that based on publication statistics, 2021 has the highest total publications with a total of 230 documents. The most types of documents are articles with a total of 671 documents and the type of source comes from journals with a total of 750 documents. Vos Viewer mapping shows that research trends regarding marine tourism include "Tourism", "Sustainable Development", "Climate Change", "Coral Reef", "Ecotourism", "Marine Protected Area", and "Tourism Management".

Keywords: Bibliometric Analysis; Publish or Perish; Marine Tourism; Vos Viewer

Abstrak

Jurnal ini didorong oleh banyaknya fenomena yang terjadi dalam pariwisata bahari. Mulai dari kawasan laut yang dilindungi, sampah plastik yang mencemari lingkungan laut, hingga berbagai fenomena lainnya yang disebabkan oleh aktivitas pariwisata bahari. Banyak penelitian yang mengkaji fenomena ini memunculkan motivasi untuk mempelajari semua fenomena yang ada dalam pariwisata bahari. Tujuan dari penelitian ini adalah untuk mengetahui tren penelitian yang berkaitan dengan pariwisata bahari dengan menggunakan metode analisis bibliometrik. Data diperoleh melalui Scopus dengan jumlah data awal sebanyak 1237 dokumen, yang kemudian disaring menjadi 978 dokumen. Dokumen tersebut diunduh dalam format file RIS dan dianalisis menggunakan matriks dalam aplikasi Publish or Perish. Pemetaan data menggunakan perangkat lunak Vos Viewer yang dibagi menjadi empat bagian, yaitu Network Visualization (Visualisasi Jaringan), Overlay Visualization (Visualisasi Lapisan), Density Visualization (Visualisasi Kepadatan), dan hubungan antar penulis berdasarkan Overlay Visualization. Hasil penelitian menunjukkan bahwa berdasarkan statistik publikasi, tahun 2021 memiliki jumlah publikasi tertinggi dengan total 230 dokumen. Jenis dokumen terbanyak adalah artikel, dengan total 671 dokumen, dan sumber dokumen terbanyak berasal dari jurnal, yaitu sebanyak 750 dokumen. Pemetaan menggunakan Vos Viewer menunjukkan bahwa tren penelitian terkait pariwisata bahari mencakup topik-topik seperti "Pariwisata", "Pembangunan Berkelanjutan", "Perubahan Iklim", "Terumbu Karang", "Ekowisata", "Kawasan Laut yang Dilindungi", dan "Manajemen Pariwisata".

Kata kunci: Analisis Bibliometrik; Scientometrik; Pariwisata Hijau; VoS Viewer

INTRODUCTION

Tourism has become one of the necessities of human life, where tourism has become a place for humans to refresh the mind and body from daily routines. The presence of tourism provides a *win-win solution* for both sides, namely tourists and tourism managers themselves. This has caused many countries or regions to compete to improve the quality of tourism they have. As for certain regions or certain countries that have uniqueness and superior attractions to be used as a tourist destination. Tourists will choose a destination that has its own uniqueness in it, so that tourists can have an experience that is different from the daily routine. In general, tourists will choose to travel to places that contrast their place of residence, such as tourists who come from urban areas will tend to choose natural tourism, or those that are far from the density and bustle of the city, while tourists who come from rural areas tend to choose to travel in urban areas with the aim of having a different experience from everyday life. As for the kinds of natural tourism, one of them is nautical tourism.

Marine tourism is one of the branches of tourism that focuses on the use of tourist areas and has the form of potential tourist areas by developing local wisdom in the area. One form of local wisdom possessed by marine tourism is the uniqueness found in the tourist area itself, such as the existence of a marine ecosystem that can be seen by tourists, and activities that can be done by tourists such as snorkeling and seagrass tours. Indonesia has a larger sea area than land, thus Indonesia's marine tourism is very diverse. The form of nautical tourism is regulated in the regulations of each region in Indonesia, as one example of the regulation is in Regent Regulation Number 35 of 2017 about Management of Marine Tourism Areas in Lampung Province which contains the implementation of the development of marine tourism attractions. So that with this regulation, marine tourism is expected not to damage marine ecosystems that must be preserved.

Research on marine tourism has been widely carried out in Indonesia and in other countries. Such as research on the geological content of Pantai Indah in Gorontalo which is one of the geosites in Gorontalo. Then research on one of the islands of Spain, namely the island of Tenerife, which examines the Corporate Social Responsibility (CSR) involved in the development of the island. Furthermore, marine tourism research in Indonesia, namely the island of Karimun Java which was studied about the Dilemma of Coastal and Marine Zoning Investment [9]. Research on Raja Ampat in Indonesia regarding the management of the management involved has been studied and the results of the study show that there are still several problems outside of the attractions owned by Raja Ampat, namely problems that include ecology, social and economic. Then research on Penghu island in Taiwan which examines sustainable development that focuses on the ecotourism service system in the Penghu island tourist area.

Previous studies have different objectives in each study, with different locations and different problems. There are studies that examine attractions in marine tourism, examine management, problems about investment, and problems regarding natural services of natural tourism, especially marine tourism. From several studies that have been mentioned, there has been no study that examines

the trend of marine tourism in 2012 – 2022. So that this study will examine research trends in the context of marine tourism. This study uses Bibliometric analysis which has coverage in the form of publication statistics and data mapping, where publication statistics include the type of document on the data, the subject area on the data, and the type of source. Meanwhile, data mapping includes network visualization, overlay visualization, density visualization, and correlations between authors with one another.

LITERATURE REVIEW

In this section will explain the theory and tools to study bibliometric analysis of nautical tourism which contains general topics, then the understanding of bibliometric analysis, then the understanding of the database used, and finally the tools used to help study marine tourism.

Marine Tourism

Nautical tourism is one of the various types of tourism. Marine tourism is a tour that has a special interest for visitors or tourists, where they can do marine activities, such as boating, swimming, fishing, snorkeling tours, or have an interest in diving. In addition, tourists who visit marine tourism tend to come from urban areas or mountainous areas because they want something different from their daily lives. Although the sea can be used as a tourist attraction, managers and visitors are required to maintain the ecosystems in the sea such as marine bivalves, seagrass environments, marine animals such as turtles, coral reefs, and other marine ecosystems.



Figure 1. Marine Protected Areas
Source: <https://blog.geogarage.com/>

Based on figure 1, it is explained that there is a protected sea area. This is done to maintain ecosystem in the sea so that it is not disturbed by human activities. As in the Banda Sea which has a Marine Protected Area which was designated in 1977 covering an area of 2500 Ha to protect marine wealth, especially coral reefs and fish. Next is the Marine Protected Area located in Oregon which is in the United States America and on Gili Trawangan which was designated on. So it can be

said that nautical tourism is not only about doing travel activities, but there are things that need to be realized so that nautical tourism can continue.

Analysis Bibliometrics

Bibliometric analysis is a popular and rigorous method for exploring and analyzing large volumes of scientific data. In addition, the use of bibliometric analysis is to analyze trends that are happening in the topic being studied. In general, bibliometric analysis is used to identify a topic on a large scale. The point of a large scale is that the data used can amount to more than a dozen documents or more than 1000 documents, depending on the download capacity of the data base used.

This analysis has been used in various studies, particularly research related to big data. Such as research on trend research in autophagy or important mechanisms for maintaining homeostasis in cells using bibliometric analysis for its research methods. Research on industrial marketing in 1990 – 2015 used bibliometric analysis as a determinant of analytical trends on topics related to large amounts of data. Studies related to titanium guide machining research trends using bibliometric methods and found that in the analysis trends the country that has the highest document publication is from China and found several keywords that are often used in research related topics.

Based on several studies that have conducted big data studies using bibliometric analysis, it can be concluded that the method has effectiveness in analyzing research trends on the topic to be studied. So that this nautical tourism study will use the bibliometric method to analyze data that has been downloaded from the database.

Scopus as a Research Data Provider

Scopus is recognized as the largest database of abstracts and citations of peer-reviewed literature covering a wide range of subjects. Scopus is also a trusted data source that has been used as a data source for various studies. As in the systematic mapping study that downloaded the big data using Scopus with the years 1984 – 2020. The results of the study showed that 175 documents met the criteria for inclusion and that the documents were continued for further review. Furthermore, namely research on Corporate Social Responsibility (CSR) related to supply chain management which became a problem a few years ago, the data used came from the Scopus database because it has reliability in accordance with related topics.

Based on several studies that have used Scopus as a data base to download more documents, this study uses the Scopus database because the Scopus database has comprehensive and realistic information. So that the results that will be obtained will be more detailed and complete. It can be said that because the Scopus database already has its own analysis results regarding the data or topics to be studied, so that it can facilitate the study and complete the content of the bibliometric study.

Vos Viewer as a Research Tool

Vos Viewer is a software to facilitate the assessment of bibliometric analysis. In its implementation, Vos Viewer is used to graphically map material and combine bibliographies and co-citations to be mapped with network formation. Vos Viewer has been trusted to visualize the data that has been downloaded through the database in this case using the Scopus data base that has been downloaded in the form of RIS format. This is evidenced by the many studies that use Vos Viewer software to map RIS files on Scopus data downloads. Such as research on food safety that examined the highest number of documents with citations, then on the management of green chain management that analyzed data at twenty years, and research on traffic accidents in India in the year after 1990.

Vos Viewer can generate mappings in the form of Network Visualization, Overlay Visualization, Density Visualization, and relationships between authors. The four mappings will be displayed on the mapping results from RIS data that has been downloaded via Scopus.

METHOD

In this paper, we adopt method analysis bibliometrics consisting of five stages, namely: Determining the keywords you are looking for, the results search start, repair results search, compile preliminary data statistics, and data analysis.

The phrase used in this study is Smart Tourism with a search based on title and carried out in November 2022. The data search used the Scopus database with the last 10 years, namely 2012 – 2022. The choice to use the Scopus database is due to having various options and analysis. Publication. So that the results of the bibliometric analysis to be obtained are expected to be complete and informative for future readers or researchers. At the beginning of the search found articles totaling 1237 documents. Documents in the initial search results are used to compare matrix citations with documents after repair. Of the 1237 articles obtained on the search beginning from Scopus database, then after filtering to obtain relevant results a total of 978 documents were obtained for further analysis using the Vos Viewer.

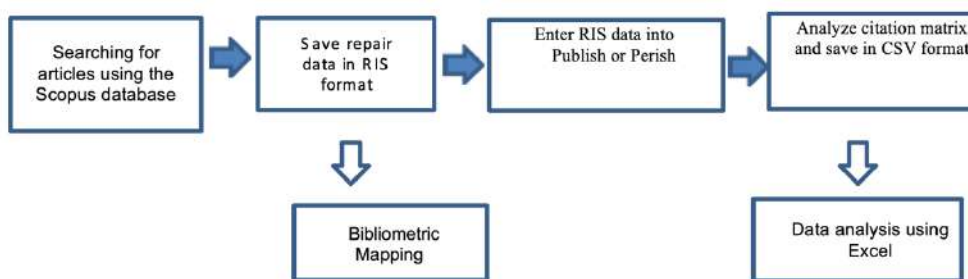


Figure 2. Flow chart of the proposed method

Source: Data Processing, 2023

Data already updated and filtered above, then checked again for completeness component article journals and reviews covering year issue, volume, number / issue, and page. Bibliographic data collection in this study through Scopus database accessed on November 1 December, 2022 at 13:48 PM. Initial search

data and data after repair are stored in the form of a RIS file and then use Publish or Perish to find out matrix citations. Repair data is stored in the form of CSV to facilitate analysis of publications per year. After performing an analysis of the publication of improved RIS data, it is used to display visualizations on the Vos Viewer software.

RESULTS AND DISCUSSION

This section explains the obtained results of this work, which includes publications and citations, visualizations, authors and networks, research locations and research domains.

Publications and citations

For knowing comparison of the citation matrix on the data taken via Scopus, then researcher make the table in which containing number article, number citation, number citations per year, number authors per year, H index, G index, normal hI, and hI yearly at the beginning search and on results repair. Comparison data matrix in result search start and result search after repair could be seen in Table 1.

Table 1. Comparison Matrix

Data	Initial Search Results	Search Results Repair
Database	Scopus	Scopus
Year publishing	(2012-2022)	(2012-2022)
Year citation	10	10
Number of Articles	1237	978
Number citation	17862	11871
Number Citation per Year	1286.20	1187.10
Number Authors per Year	4,49	4.36
H index	58	46
G index	101	82
hI Normal	27	22
hI Annual	2.70	2.20

Source: Data Processing, 2023

Table 1 shows a matrix comparison of the data downloaded via Scopus on December 1, 2022. The results of the matrix comparison above are obtained from calculations on the Publish or Perish software. In addition to being used to download big data, Publish or Perish can also be used to find out matrix data on a data in RIS or CSV format. In the first column there is the name of the data listed on the Publish or Perish software, containing the database, Year publishing, Year citation, Number of Articles, Number citation, Number Citation per Year, Number Authors per Year, H index, G index, hI Normal, and hI Annual which has each amount different. In the second column there is data before repairs are made and in the third column there is the number of calculations after going through data repairs. For data on database retrieval, year publishing, and year citation have similarities while the rest are different.

The number of articles in the data before the repair was 1237 and reduced by 259 documents that did not meet the criteria. So that the number of remaining documents is 978 documents. This affects the number of citations in the data after

improvement. In the data before the improvement, the number of citations reached 17862 and decreased by 5991 so that the total citations in the data after the improvement were 11871 citations. The average author in the data before the repair was 4.49 while after the repair was 4.36. H index and G index after improvement decreased to 82 and 22, while annual gi after improvement amounted to 2.20. Table 2 as follow describe the statistics descriptive of related publications each year.

Table 2. The statistics descriptive of publication

Year	TP	%(N=978)	NCP	TC	C/P	C/CP
2012	28	0,03	27	723	25,82	26,78
2013	26	0,03	24	695	26,73	28,96
2014	26	0,03	26	2449	94,19	94,19
2015	29	0,03	27	763	26,31	28,26
2016	59	0,06	55	1661	28,15	30,20
2017	62	0,06	29	1278	20,61	44,07
2018	98	0,10	87	1024	10,45	11,77
2019	122	0,12	104	979	8,02	9,41
2020	154	0,16	144	1242	8,06	8,63
2021	230	0,24	159	941	4,09	5,92
2022	144	0,15	40	116	0,81	2,90
	978	100%				

Source: Data Processing, 2023

Note: TP = total number of publications; NCP = number cited publications; TC= total quotes; C/P=average citations per publication; C/CP= average citation per cited publication. Next, table 2 shows the statistics on the data after the repair. The data used to perform bibliometric analysis is only data after improvement. The data before the repair is used to perform matrix comparisons as in table 1. Furthermore, the data before the fix is deprecated on bibliometric analysis. In 2021, it has the highest number of publications, namely 230 publications in one year or equivalent to 24% of the total documents. The number of documents cited in 2021 was 159 documents, it can be said that the total publications cited were more than half of the documents in 2021. The total citations in 2021 were 941. Figure 3 as follow depicts the bar chart of publication and citations.

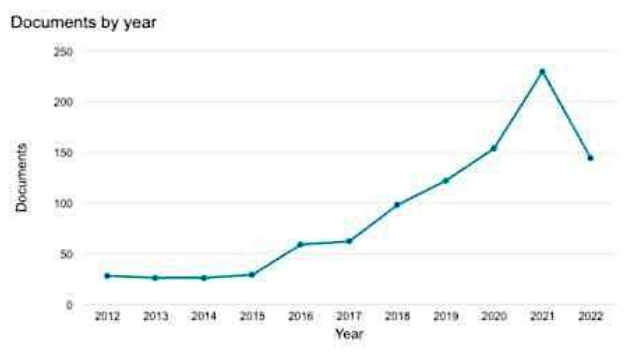


Figure 3. Publication from 2012-2022

Source: Data Processing, 2023

Figure 3 shows the movement of the publication chart from 2012 – 2022. It can be concluded that from 2012 to 2022 it did not experience a very noticeable decline, but in the movement of the chart above, it was found that publications more often experienced an increase than a decrease. The decline only occurred in 2021 – 2022, but the decline was still above the threshold of the lowest publication years, namely in 2013 and 2014 which had 26 publications, while in 2022 it had 144 documents published.

Figure 4 as follow depicts the documents by subject area.

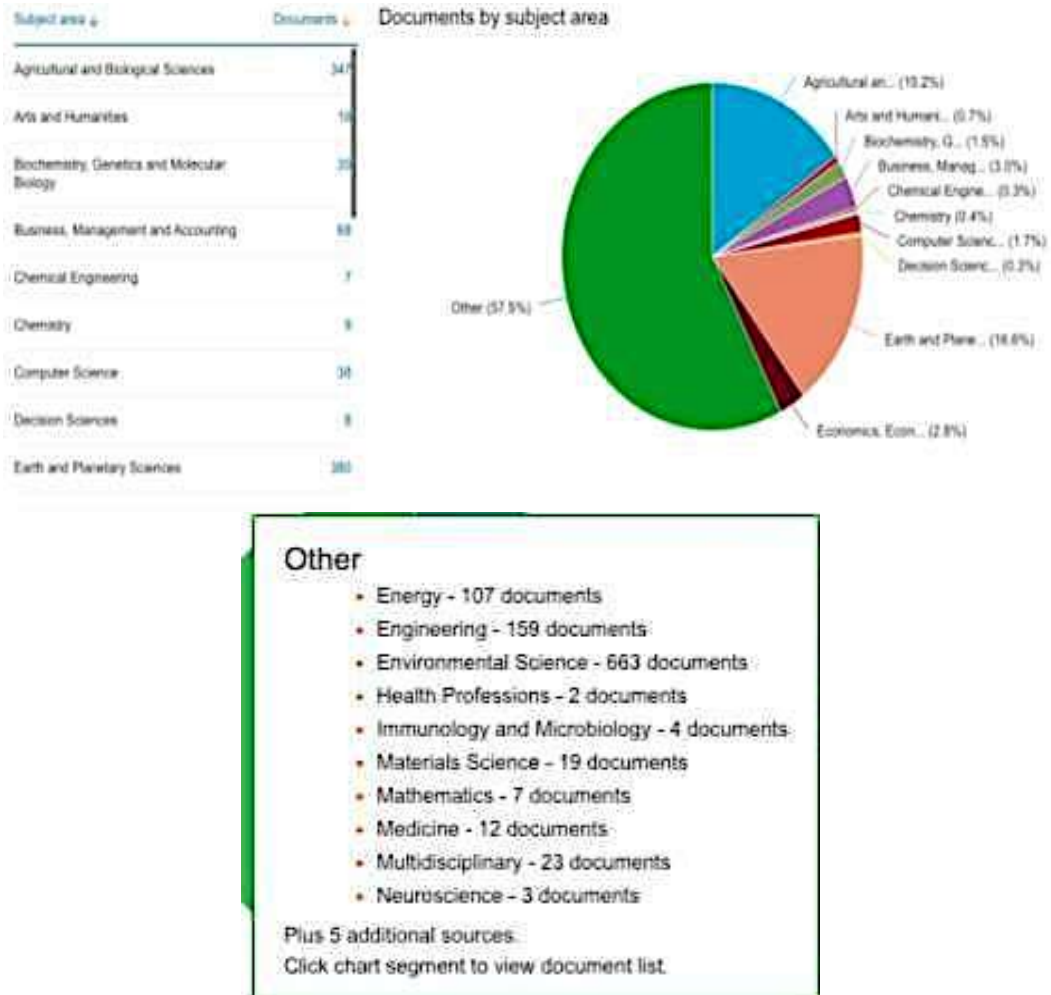


Figure 4. Distribution of Documents by Subject Area
 Source: Data Processing, 2023

The next stage in publication and citation is a document based on the subject area. The subject area is distinguished by color. It can be known based on figure 4 that green dominates the diagram. The green color indicates a different subject in it. In the green area there is the subject "Energy" with a total of 107 documents, "Engineering" 159 documents, "Environmental Science" 663 documents, "Health Profession" 2 documents, "Immunology and Microbiology" 4 documents, "Material Science" 19 documents, "Mathematics" 7 documents, "Medicine" 12 documents, "Multidisciplinary" 23 documents, and "Neuroscience" 3 documents.

The peach-colored area indicates the subject of "Earth and Planetary Science"

which has 380 documents and the blue area indicates the subject of "Agricultural and Biological Science" which has a total of 347 documents. Then the rest is filled by "Arts and Humanities" with a total of 16 documents, "Biochemistry, Genetics, and Molecular Biology" as many as 35 documents, "Business, Management, and Accounting" a total of 68 documents, "Chemical Engineering" as many as 7 documents, "Chemistry" as many as 9 documents, "Computer Science" 38 documents, and " Decision Science" 8 documents.

Documents by type

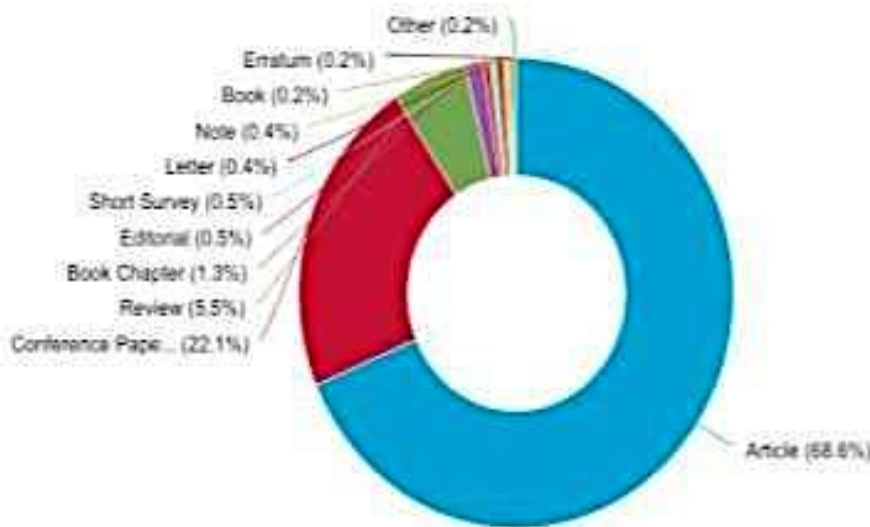


Figure 5. Documents by type area from 2012-2022 Table 3 as follow describes the type of documents.

Source: Data Processing, 2023

Table 3. Type Document

Type	Number	Percentage
Article	671	0,69
Conference Paper	216	0,22
Review	54	0,06
Book Chapter	13	0,01
Editorial	5	0,01
Short Survey	5	0,01
Letter	4	0,00
Note	4	0,00
Book	2	0,00
Erratum	2	0,00
Other	2	0,00
	978	100%

Source: Data Processing, 2023

Figure 5 and table 3 are analysis of the document type. In figure 3, it is shown that the article has the largest percentage with 68.6%, then in the second position, namely conference papers with a percentage of 22.1%, and the third position is reviews with a percentage of 5.5%. While the rest are book chapter 1.3%, editorial 0.5%, short survey 0.5%, letter 0.4%, note 0.4%, book 0.2%, erratum 0.2%, and other 0.2%. The calculations contained in the table are calculations through Micosoft Excel, so that the percentage shown in the table is different from the percentage shown in figure 5. However, the resulting amount remains the same, except that in the table the percentage numbers are rounded. So that the letter, note, book, erratum, and other types have a percentage of 0% because if 0.5% is rounded it will be 0%. Table 6 as follow describes the top five publisher on the related field.

Table 6. Top five publishers on the related field

No	Publisher	Number of Articles	Percentage
1	Elsevier	134	0,27
2	MDPI	112	0,23
3	Institute of Physics Publishing	87	0,18
4	Frontiers Media S.A.	86	0,17
5	IOP Publishing Ltd	73	0,15
		492	100%

Source: Data Processing, 2023

Based on the improved data changed from RIS file to CSV file, 5 publishers have the highest number of documents in 2012 – 2022 publications. Elsevier has the highest publications with a total of 134 documents, equivalent to 27% of the total data. MDPI is the publisher with the second most documents after Elsevier with a total of 112 documents or 23%, while in third place is the Institute of Physics Publishing with a total publication of 87 documents 18% of the total of the whole. Then the rest are Frontiers Media S.A. and IOP Publishing Ltd with percentages of 17% and 15%, respectively.

Visualization topics use Vos Viewer

This section describes mapping repair data using Vos Viewer software to be explored for data analysis and visualization. In this stage, the mapping is divided into 4 parts, namely, Network Visualization, Overlay Visualization, Density Visualization, and the relationship between authors using Overlay Visualization. Figure 6 below this show visualization of topic areas using network visualization from Vos Viewer.

Figure 6 is a mapping of data through Network Visualization or mapping based on a network connected between one item and another. The results of the mapping are different from the data that has been exported from Scopus in the form of a RIS file and processed using Vos Viewer. Using the provision for a minimum number of occurrences of a maximum of 5 keywords so as to produce 390 selected keywords. The mapping in figure 6 produces 8 clusters with a network of 12454 and a total network formed of 20456. Clusters are distinguished by colors on the item nodes, which are described in more detail in table 8. Figure 8 as follow describes the visualization topic area using overlay visualization from Vos Viewer.

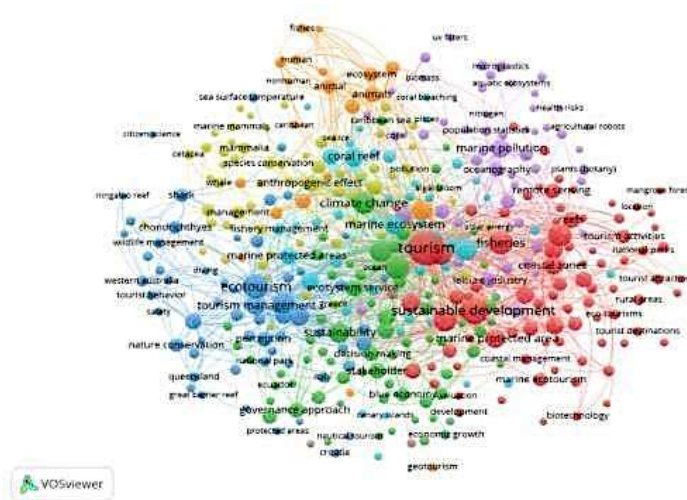


Figure 6. Visualization topic area using network visualization
 Source: Data Processing, 2023

Figure 7 is a mapping using overlay visualization. In the overlay visualization there is an indicator that nodes that have a lighter color have a new publication year. This mapping can be used to find out items that are often used or that are often researched annually. The "Tourism", "Fisheries", and "Sustainable Development" items have light green node warrants indicating that the publication average is in 2019. The yellow nodes show the average publication in 2020 – 2022 such as the "Marine Pollution", "Economic Growth", and "Microplastic" items studied in recent years. Nodes with a dark green color indicate the average year of publication in 2018 as in the items "Ecotourism", "Sustainability", and "Marine Ecosystem". Meanwhile, the blue and the purple colors on the nodes show the average publication year in 2017 and below, such as the items "Tourist Behavior", "Fishery Management", and "Species Conservation".

Figure 8 as follow describes the visualization topic area using density visualization from Vos Viewer.

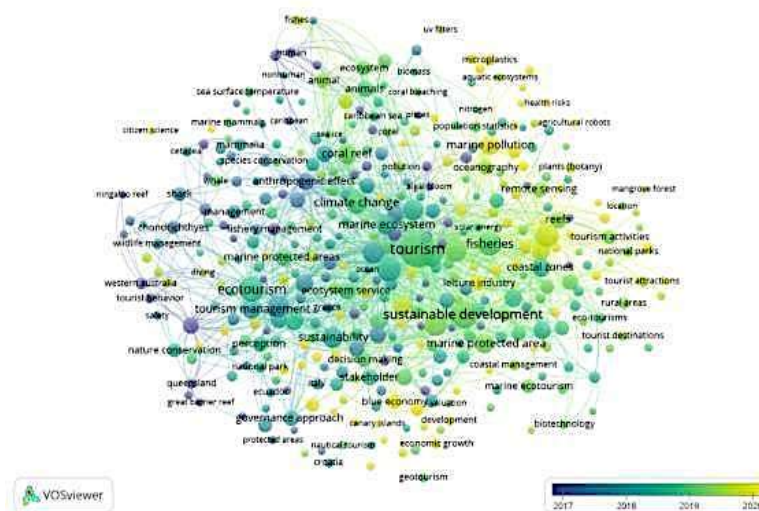


Figure 7. Visualization topic area using overlay visualization
 Source: Data Processing, 2023

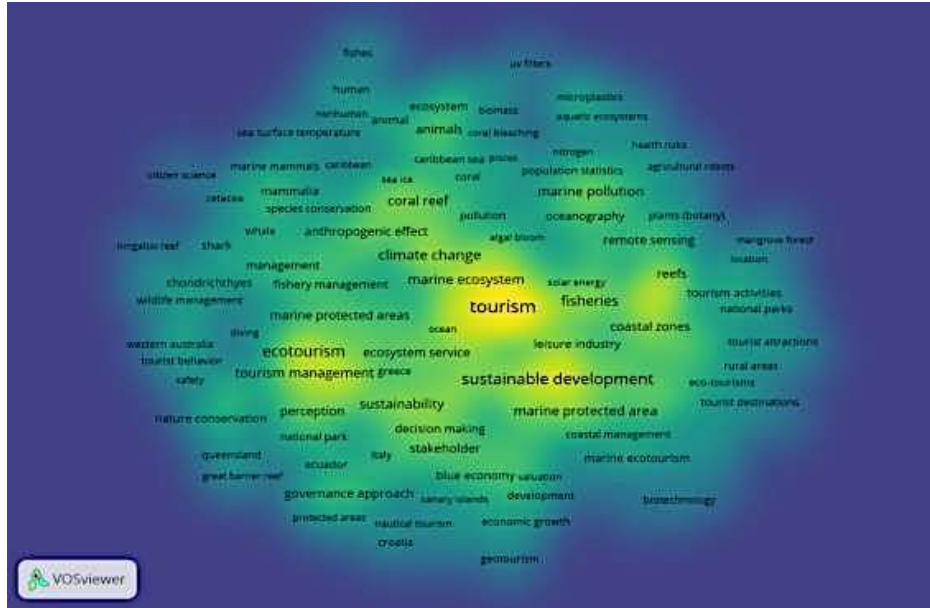


Figure 8. Visualization topic area using density visualization
 Source: Data Processing, 2023

Figure 8 shows a mapping based on density visualization. Density Visualization can be seen about the use of items, the items are researched through their color and then mapped or visualized to how often the items will be used in research. In the light color on the item indicates that the item is often used in research such as "Tourism", "Sustainable Development", "Climate Change", "Coral Reef", "Ecotourism", "Marine Protected Area", and "Tourism Management". While the color that is not bright indicates that the item is rarely used in related research topics, such as "Geotourism", "Microplastics", "Aquatic Ecosystems", and "Biotechnology".

Items that have bright colors are research trends in marine tourism topics in 2012 – 2022, while items that have faded colors are not research trends, because they are rarely used in studies on marine tourism. So that it is of good value to get novelty in the next research if you use items that have not become a research trend in 2012 - 2022.

Author and Relationship between writer

Figure 10 below depicts overlay visualization of the author and co-author using VoS Viewer.

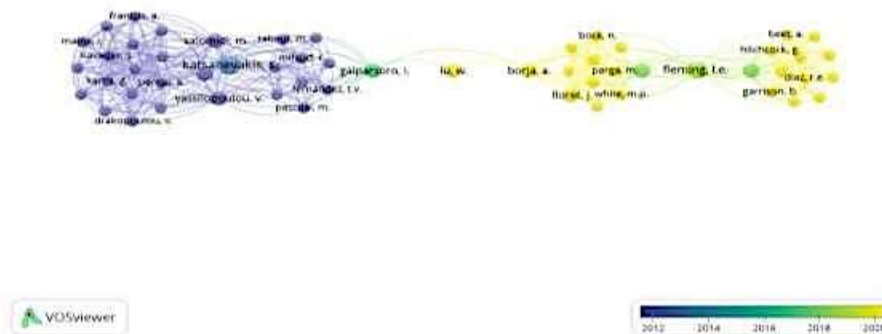


Figure 9. Visualization of the author and co-author overlay
 Source: Data Processing, 2023

Figure 9 shows the correlation between one author and another. The results of the mapping obtained a network of 435 and a total link strength of 443. The number of authors who are related to each other is 56. Based on the mapping results, there are two authors who have a big influence on other authors, namely Katsanevakis who had an average publication in 2013 so that the color of the nodes on the items was dark with a total network formed of 32 networks and Fleming who had an average publication in 2018 with a total network of 26 networks formed, so that the color on the item node is bright or yellow.

Research Locations and Research Domains

Figure 10 below depicts the author’s country of origin.

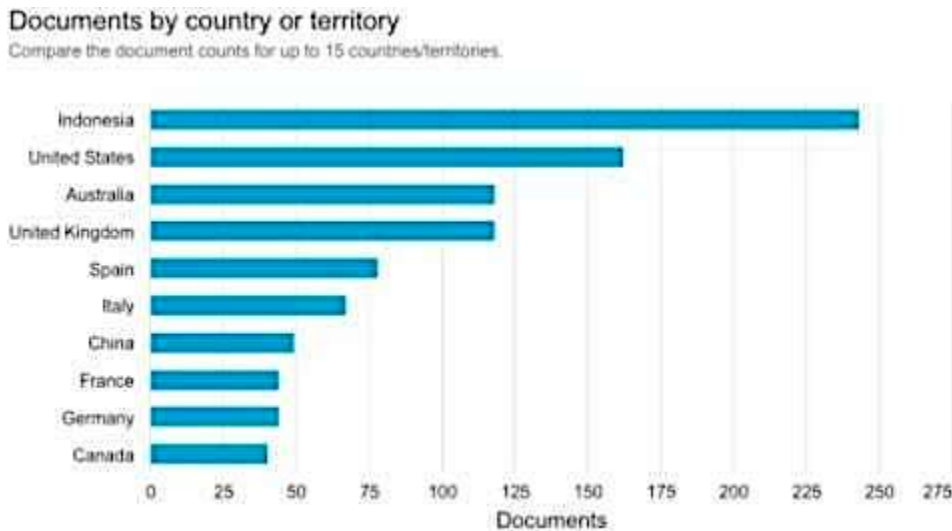


Figure 10. Country of origin
 Source: Data Processing, 2023

Based on the results of Scopus' analysis, the top 10 countries have high publication rates. The most countries that have publications about marine tourism are Indonesia. This is because Indonesia is one of the largest maritime countries in the world, so many researchers are studying the marine in Indonesia.



Figure 11. Map of country of origin
 Source: <https://mapchart.net/>

Figure 11 is a publication on nautical tourism. The countries above are marked

based on figure 10 which is the result of an analysis from Scopus using data after improvement. Table 9 explains the research domains in each country and the total publications in the top 10 countries with the highest publications.

Table 9 below presents the country of research location and their respective research domain.

Table 9. Top 10 Country of location research and research domain

No	Country	Number of Articles	Research domain
1	Indonesian	243	Tourism, sustainable development, fisheries, Indonesia, ecosystem, tourism development, conservation, reefs, biodiversity, ecology
2	United States	162	Tourism, marine industry, tourism management, beaches, economics, marine biology, marine protected area, ecotourism areas
3	Australia	118	Australia, tourism, ecotourism, marine park, climate change, fishing, ecosystem services, marine environment
4	United Kingdom	118	Tourism, marine tourism, marine policy, ecosystem management, ecosystem services, tourism development
5	Spain	78	Spain, tourism, coastal zone, marine ecosystem, marine environment, Mediterranean Sea, fisheries, sustainability
6	Italy	67	Italy, marine tourism, climate change, environmental impact, sustainable development, ecosystems
7	China	49	Sustainable development, tourism, China, offshore oil well production, marine biology
8	France	44	Tourism, marine pollution, ecosystems, environmental protection, leisure industry
9	Germany	44	Tourism, climate change, fisheries, marine environment, sustainability, ecosystems
10	Canada	40	Climate change, conservation management, tourism, conservation, marine environment

Source: Data Processing, 2023

Indonesia is the country that publishes the most about marine tourism. There are 243 documents with research domains Tourism, sustainable development, fisheries, Indonesia, ecosystem, tourism development, conservation, reefs, biodiversity, and ecology. Then followed by the United States with a total of 162 publications, and in the third position there is Australia with a total publication of 118 documents.

Research domains that often appear are "Tourism", "Marine Tourism", "Sustainable Development", "Ecotourism", and "Climate Change". The frequently emerging research domain is in line with the mapping results in the density visualization in figure 8, which shows that the research domain has a high usage rate compared to other research domains.

CONCLUSION

Marine tourism is one of the many branches of tourism that has an important role in it. These important regulations include marine protection, applicable regulations, and the responsibility of companies that participate in the development of marine tourism. The many phenomena and problems that arise with the existence of nautical tourism cause a sense of curiosity for researchers to study marine tourism. Especially in Indonesia, which has the highest total publications compared to other countries, due to the large number of marine tourisms in Indonesia. The number of studies that examine marine tourism, makes this study examine all research on marine tourism in 2012 - 2022 with the aim of determining the analytical trends of marine tourism. As well as knowing what parts are rarely used by researchers to study marine tourism. The results show that the year with the highest publication is in 2021 with a total of 230 publications and a total of 159 citations. The types of documents that dominate the data, namely articles and the highest source of documents, come from journals with a total of 750 documents. Meanwhile, the mapping results using Vos Viewer show that there are 8 clusters with a total network of 20456 and items that are often used in research are "Tourism", "Sustainable Development", "Climate Change", "Coral Reef", "Ecotourism", "Marine Protected Area", and "Tourism Management". While items that are rarely used are "Geotourism", "Microplastics", "Aquatic Ecosystems", and "Biotechnology".

The existence of items that are rarely used in marine tourism research in 2012 – 2022 can provide an opportunity for future research to produce a novelty in research on the topic of marine tourism. It is hoped that this study will help further research to review marine tourism.

REFERENCES

- A. Bahar, A. Tuwo, and F. Fachri Masalan, "Suitability and development strategy for Turtle Ecotourism in Kapoposang Islands Marine Tourism Park, South Sulawesi, Indonesia," 2021, vol. 860, no. 1. doi: 10.1088/1755-1315/860/1/012050.
- A. Noerhayati, THE ROLE OF FACTORS THAT CAN INCREASE THE INTENTION OF TOURISTS TO REVISIT MARINE TOURISM IN THE THOUSAND ISLANDS. repository.fe.unj.ac.id, 2022. [Online]. Available: <http://repository.fe.unj.ac.id/id/eprint/10313>
- A. Ramadhan, T. A. Argo, and W. A. Salim, "Investment Dilemma of Coastal and Marine Zoning in Conservation Areas: Case Study of Karimunjawa National Park," 2021, vol. 799, no. 1. doi: 10.1088/1755-1315/799/1/012017.
- A. Syukur, A. A. Idrus, K. R. Dewi, N. Juniati, and Irmayani, "The Evidence of Seagrass Environmental Support for Local People's Economic on the South Coast of Lombok Island," vol. 913, no. 1, 2021, doi: 10.1088/1755-1315/913/1/012051.

- C. Y. Hsiao, C. M. Kuo, and C. L. Tuan, "Island Ecological Tourism: Constructing Indicators of the Tourist Service System in the Penghu National Scenic Area," *Front. Ecol. Evol.* , vol. 9, 2021, doi: 10.3389/fevo.2021.708344.
- D. Novia, A. Husaeni, A. Bayu, and D. Nandiyanto, "A Bibliometric Analysis of Vocational School Keywords Using VOSviewer," 2022, doi: 10.17509/xxxx.xxxx.
- D. Oktaviani, S. R. Suharti, I. N. Edrus, I. S. Hermana, J. M. S. Pelupessy, and D. Nugroho, "Initiating Napoleon wrasse (*Cheilinus undulatus* Ruppell, 1835) as watching species object in Banda Islands marine ecotourism," 2021, vol. 800, no. 1. doi: 10.1088/1755-1315/800/1/012053.
- E. Mauleon-Mendez, J. Genovart-Balaguer, J. M. Merigo, and C. Mulet-Forteza, "Sustainable tourism research towards twenty-five years of the journal of sustainable tourism," *Adv. Hosp. Tour. Res.* , vol. 6, no. 1, pp. 23–46, 2018, doi: 10.30519/ahtr.406555.
- F. Fahim and B. Mahadi, "Green supply chain management/green finance: a bibliometric analysis of the last twenty years by using the Scopus database," *Environ. Sci. Pollut. Res. Int.* , vol. 29, no. 56, pp. 84714–84740, 2022, doi: 10.1007/s11356-022-21764-z.
- F. J. Garrigos-Simon, M. D. Botella-Carrubi, and T. F. Gonzalez-Cruz, "Social capital, human capital, and sustainability: A Bibliometric and visualization analysis," *Sustain.* , vol. 10, no. 12, 2018, doi: 10.3390/su10124751.
- F. Munir, Y. M. Yani, Y. E. Nizmi, and C. Suyastri, "State of The Art Para-Diplomacy: A Systematic Mapping Studies and a Bibliometric Analysis VOS Viewer in Scopus Database," *Acad. J. Interdiscip. Stud.* , vol. 11, no. 2, pp. 129–141, 2022, doi: 10.36941/ajis-2022-0040.
- G. Gaurav, A. Sharma, G. S. Dangayach, and M. L. Meena, "Bibliometric analysis of machining of titanium alloy research," vol. 44, pp. 4031–4038, 2020, doi: 10.1016/j.matpr.2020.10.217.
- H. K. Fox and T. C. Swearingen, "Using a difference-in-differences and synthetic control approach to investigate the socioeconomic impacts of Oregon's marine reserves," *Ocean Coast. Manag.* , vol. 215, 2021, doi: 10.1016/j.ocecoaman.2021.105965.
- H. Onyeaka, C. K. Anumudu, C. A. Okolo, A. Anyogu, O. Odeyemi, and A. P. Basse, "A review of the top 100 most cited papers on food safety," *Qual. Assur. Saf. Crop. Foods*, vol. 14, pp. 91–104, 2022, doi: 10.15586/QAS.V14I4.1124.
- I. Andriyani and L. Husnita, "Socioeconomic changes in society after the development of marine tourism in the Sikakap islands, Mentawai Regency," *J. Sos. Mamangan*, 2012, [Online]. Available: <https://ejournal.upgrisba.ac.id/index.php/jurnalmamangan/article/view/13>

- I. Dillenia et al. , "Study of the Historic Shipwreck Sites Area Development for Marine Ecotourism in Thousand Islands," 2021, vol. 925, no. 1. doi: 10.1088/1755- 1315/925/1/012028.
- J. D. Prasetya, D. Hudawan, and ..., "Study of Coral Cover Conditions on the Carrying Capacity of Marine Tourism in karimunjawa Islands, Central Java," J. Miner. Energy, and... , 2021, [Online]. Available: <http://www.jurnal.upnyk.ac.id/index.php/JMEL/article/view/3837>
- J. H. Prawira, U. Rahmani, and ..., "The Impact of Marine Tourism on Coral Reefs and Seagrass Resources on Tidung Island, Thousand Islands," J. Ilm. Satya... , 2020, [Online]. Available: <https://satyaminabahari.org/index.php/jism/article/view/97>
- J. Md Khudzari, J. Kurian, B. Tartakovsky, and G. S. V. Raghavan, "Bibliometric analysis of global research trends on microbial fuel cells using Scopus database," Biochem. Eng. J. , vol. 136, pp. 51–60, Aug. 2018, doi: 10.1016/j.bej.2018.05.002.
- K. Okaiyeto and O. O. Oguntibeju, "A web of science-based analysis of global research trends on moringa oleifera from 2010 – 2019," J. Nat. Remedies, vol. 21, no. 4, pp. 333–349, 2021, doi: 10.18311/jnr/2021/26542.
- L. A. A. Bakti, Marjono, G. Ciptadi, and F. Putra, "Resilience Thinking Approach to Protect Marine Biodiversity in Small Islands: A Case of Gili Trawangan, Indonesia," 2021, vol. 933, no. 1. doi: 10.1088/1755-1315/933/1/012012.
- L. C. Woodall et al. , "The deep sea is a major sink for microplastic debris," R. Soc. Open Sci. , vol. 1, no. 4, Dec. 2014, doi: 10.1098/rsos.140317.
- L. M. Valenzuela Fernandez, C. Nicolas, J. M. Merigó, and F.-J. Arroyo-Cañada, "Industrial marketing research: a bibliometric analysis (1990-2015)," J. Bus. Ind. Mark. , vol. 34, no. 3, pp. 550–560, 2019, doi: 10.1108/JBIM-07-2017-0167.
- L. Zamzami, "Dynamics of Social Institutions towards the Local Wisdom of Fishing Communities in Preserving Marine Tourism Culture," J. Antropol. Social Issues. , 2016, [Online]. Available: <http://jurnalantropologi.fisip.unand.ac.id/index.php/jantro/article/view/53>
- M. Ali, "The Marine Tourism Potential of Bandar Lampung Market Island," Pros. Lemonmen. Nas. Puffer , 2015, [Online]. Available: <https://jurnal.polinela.ac.id/PROSIDING/article/view/580>
- M. Andrello, E. S. Darling, A. Wenger, A. F. Suárez-Castro, S. Gelfand, and G. N. Ahmadi, "A global map of human pressures on tropical coral reefs," Conserv. Lett. , vol. 15, no. 1, 2022, doi: 10.1111/conl.12858.

- M. R. Bilad, "Bibliometric Analysis for Understanding the Correlation Between Chemistry and Special Needs Education Using VOSviewer Indexed by Google," 2022. [Online]. Available: <https://ejournal.bumipublikasinusantara.id/index.php/ajcsne>
- N. Donthu, S. Kumar, D. Mukherjee, N. Pandey, and W. M. Lim, "How to conduct a bibliometric analysis: An overview and guidelines," *J. Bus. Res.*, vol. 133, pp. 285–296, Sep. 2021, doi: 10.1016/j.jbusres.2021.04.070.
- N. J. Bennett and P. Dearden, "Why local people do not support conservation: Community perceptions of marine protected area livelihood impacts, governance and management in Thailand," *Mar. Policy*, vol. 44, pp. 107–116, Feb. 2014, doi: 10.1016/j.marpol.2013.08.017.
- N. M. Modak, S. Sinha, A. Raj, S. Panda, J. M. Merigó, and A. B. Lopes de Sousa Jabbour, "Corporate social responsibility and supply chain management: Framing and pushing forward the debate," *J. Clean. Prod.*, vol. 273, 2020, doi: 10.1016/j.jclepro.2020.122981.
- N. Sharma, M. Bairwa, B. Gowthamghosh, S. D. Gupta, and D. K. Mangal, "A bibliometric analysis of the published road traffic injuries research in India, post-1990," *Heal. Res. Policy Syst.*, vol. 16, no. 1, 2018, doi: 10.1186/s12961-018-0298-9.
- Nuraini, A. Satria, E. S. Wahyuni, and D. G. Bengen, "Strengthening marine ecotourism management's institutional performance in Raja Ampat, Indonesia," *Pertanika J. Soc. Sci. Humanit.*, vol. 29, no. 3, pp. 1809–1829, 2021, doi: 10.47836/pjssh.29.3.18.
- O. González-Morales, A. Santana Talavera, and D. Domínguez González, "The involvement of marine tourism companies in CSR: the case of the island of Tenerife," *Environ. Dev. Sustain.*, vol. 23, no. 8, pp. 11427–11450, 2021, doi: 10.1007/s10668-020-01120-2.
- P. Ferlando, "The Performance of the Tourism Office Apparatus in the Development of Marine Tourism Attractions in Pesawaran Regency, Lampung Province." *eprints.ipdn.ac.id*, 2021. [Online]. Available: <http://eprints.ipdn.ac.id/6296/>
- S. Katsanevakis et al., "Impacts of invasive alien marine species on ecosystem services and biodiversity: A pan-European review," *Aquat. Invasions*, vol. 9, no. 4, pp. 391–423, Nov. 2014, doi: 10.3391/ai.2014.9.4.01.
- S. Nasution, I. Effendi, S. Nedi, and M. Mardalisa, "Species Diversity of Marine Bivalves from the Strait of Rupert Island Riau Province, Indonesia," 2021, vol. 934, no. 1. doi: 10.1088/1755-1315/934/1/012071.
- T. Hong, X. Feng, W. Tong, and W. Xu, "Bibliometric analysis of research on the trends in autophagy," *PeerJ*, vol. 2019, no. 6, 2019, doi: 10.7717/peerj.7103.

Y. I. Arifin, I. N. Manyoe, and S. S. S. Napu, "Geological study of Pantai Indah for geotourism development based on geological observation and assessment of science, education, tourism and the risk degradation," 2021, vol. 1968, no. 1. doi: 10.1088/1742- 6596/1968/1/012048.