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Blibiometric Analysis of Blue Economy Studies in Realizing an Inclusive Regional Economy

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Abstrak: *Ekonomi biru merupakan suatu konsep ekonomi yang bertujuan menciptakan sistem ekonomi berkelanjutan, dengan landasan pada prinsip-prinsip alam dan kearifan lokal. Tujuan utama Ekonomi Biru adalah untuk memperkuat sistem ekonomi lokal dan meningkatkan kesejahteraan masyarakat, dengan mengurangi resiko kerusakan lingkungan akibat dari eksploitasi sumber daya alam yang berlebihan. Penelitian ini menggunakan mix-method, dengan menggunakan pendekatan blibiometrik dan literature review. Analisis bibliometric digunakan untuk mengevaluasi perkembangan literatur tentang sebuah topik selama periode tertentu. Alat analisis yang digunakan dalam penelitian ini adalah aplikasi Publish or Perish (PoP), Microscof Exel, dan perangkat lunak VOSviewer 1.6.20. Hasil penelitian ini menunjukan bahwa network visualization menunjukkan blue economy berkaitan erat dengan sustainable development goals, mariculture, sids, small island developing state, ocean economy, economic growth, Caribbean, marine economy, marine resaource, shipping. Selain itu juga pada peta overlay visualization istilah Blue economy berwarna hijau terang, artinya semakin terang warnanya maka penelitian ini semakin baru. Terakhir, peta Density Visualization istilah blue economy berwarna kuning cerah, hal ini menunjukkan bahwa blue economy menjadi kata kunci yang paling sering digunakan dalam suatu jurnal. Kemudian disusul oleh sustainable development, sustainability, economic growth, marine environment, dan governance approach.*
Kata Kunci: *Ekonomi Biru, Analisis Bibliometric, Ekonomi Daerah*

Abstract : *Blue economy is an economic concept that aims to create a sustainable economic system, based on the principles of nature and local wisdom. The main objective of Blue Economy is to strengthen local economic systems and improve community welfare, by reducing the risk of environmental damage due to excessive exploitation of natural resources. This study uses a mix-method, using a bibliometric approach and literature review. Bibliometric analysis is used to evaluate the development of literature on a topic over a certain period. The analytical tools used in this study are the Publish or Perish (PoP) application, Microsoft Excel, and VOSviewer 1.6.20 software. The results of this study indicate that network visualization shows that blue economy is closely related to sustainable development goals, mariculture, sids, small island developing states, ocean economy, economic growth, Caribbean, marine economy, marine resources, shipping. In addition, on the overlay visualization map, the term Blue economy is bright green, meaning that the brighter the color, the newer this research is. Finally, the Density Visualization map of the term blue economy is bright yellow, this shows that blue economy is the most frequently used keyword in a journal. Then followed by sustainable development, sustainability, economic growth, marine environment, and governance approach.*

Keywords: *Blue Economy, Bibliometric Analysis, Regional Economy*

Introduction

Based on Law Number 29 of 2022 concerning the Establishment of the Province of Southwest Papua, making the Province of Southwest Papua the youngest province in Indonesia. Before experiencing expansion, the Province of Southwest Papua was part of the Province of West Papua. Geographically, the Province of Southwest Papua has territorial boundaries in the part The north is bordered by the Pacific Ocean, in the east it borders the Province of West Papua, in the south by the Seram Sea and Berau Bay and in the west it is bordered by the Halmahera Sea and the Seram Sea. The area of West Papua Province reaches 60,275.3 km2 which is divided into 5 Regency, 1 City, 132 Sub-

districts, 75 sub-districts and 1,049 villages. (Handayani & Hidayah, 2023)

Southwest Papua has extraordinary natural resources, such as oil, natural gas, agriculture, fisheries, marine, forestry, and tourism which are located in every region in the province of West Papua, including.

Table 1. Natural Potential of the Regency

No	**Regional Name**	**Regional Potential and Contribution to GRDP**	
		Sector	**Natural resources**
1	Sorong Regency	Industry	Sorong Special Economic Zone
		Agriculture	Paddy
2	Sorong City	Fishery	Lemuru Fish, and Mackerel Fish
3	Tambrauw Regency	Farm	Beef cattle
4	Maybrat Regency	Tourist	Lake Ayamaru
5	Raja Ampat Regency	Tourist	Geopark Marine Tourism
		Fishery	Skipjack Tuna, Mackerel
6	South Sorong Regency	Plantation	Cocoa and Coconut

BPS data processed 2023

However, abundant natural resources have not been able to provide equal prosperity to the community, especially the Indigenous Papuan (OAP) community. This is reflected in the Human Development Index (HDI) of West Papua Province which only reached 68.63 in 2024,

making it one of the provinces with the lowest HDI in Indonesia. In addition, in 2024 data, West Papua became the province with the fifth highest poverty rate in Indonesia. (Central Statistics Agency of West Papua Province, 2023) Since the beginning of the pandemic in 2020, the number of poor people in West Papua has increased by around 13.78 thousand people, reaching 222.36 thousand people in September 2022. When compared to the Maluku region, the percentage of poverty in West Papua is much higher, even though the province has the highest Gross Regional Domestic Product (GRDP) per capita among the four easternmost regions of Indonesia. This disparity is caused by the dominance of the oil and gas sector in contributing to GRDP, the benefits of which are only felt by a small portion of the population. (Statistics, 2022)

In addition to economic problems, other problems have also emerged that worsen the economic conditions in the province of Southwest Papua, namely the problem of land rights. Unlike other islands, land ownership in West Papua is divided into state rights and customary rights. Customary land rights are owned by customary leaders, with two land tenure systems: communal ownership based on small or large clans, and individual ownership based on descent. Customary land usually cannot be sold or transferred freely to outsiders, because it is an important part of life and ancestral heritage. However, conflicts often occur when land that has been sold is still considered by some family members as their own, causing legal and social problems in the community. This is a challenge for people working in the agricultural sector.

Based on the above problems, a strategic step is needed by utilizing the potential of natural resources and human resources owned by the Province of Southwest Papua so that it can contribute to the welfare of the community, especially the OAP Community. If we look at table 1.1, the Province of Southwest Papua has extraordinary natural conditions and is very profitable in the fisheries, agriculture, plantations, and tourism sectors, then from the 6 (six) districts/cities in the Province of Southwest Papua, which include Sorong City, Raja Ampat Regency, Sorong, South Sorong, Maybrat, and Tambrauw, only 1 (one) district does not have direct access to sea waters, namely Maybrat Regency. This makes the sea an important part that cannot be separated from its role in the lives of the people of the Province of Southwest Papua. The coverage area is quite large bordering sea waters, with a total coastline length of more than 2000 km, of course it affects the lifestyle of the community both in relation to livelihoods, transportation, entertainment, and consumption patterns of the community.

The population in Southwest Papua still tends to focus on economic activities that are closely related to the utilization and management of natural resources. Although for Sorong City, some of the population's economic activities have begun to shift to the trade and service sectors, for most other areas, jobs related to agriculture are still the main focus of the population. Various jobs that are closely related to natural or agricultural products such as farming, raising livestock, taking forest products, as well as fishing and other aquatic commodities are still the main fields of work for the majority of the population in Southwest Papua. Based on data from the National Labor Force Survey (SAKERNAS) in August 2023, the percentage of the population of

West Papua Province whose main field of work is the Fisheries, Agriculture, and Forestry Category, (also including businesses in the fields of food crops, horticulture, plantations, and livestock) reached 35.59 percent of the 560,883 population aged 15 years and over who work. (Handayani & Hidayah, 2023)

Based on the results of the 2023 Agricultural Census (ST2023), the number of Agricultural Business Households (RTUP) working in the Fisheries sub-sector is 9,525 households with 975 households working in the fisheries cultivation sub-sector, and 8,761 households working in the fishing sub-sector. When viewed from the number of Individual Agricultural Businesses (UTP), the number of fisheries sub-sector businesses reached 9,817 agricultural businesses with 988 businesses engaged in the fisheries cultivation sub-sector and 9,039 agricultural businesses engaged in the fishing sub-sector. In contrast to fish farming in the sea, the largest number of fish farming households in brackish water is in Tambrauw Regency with a total of 25 households, with the majority cultivating tilapia. Apart from tilapia, other types of fish that are also cultivated in brackish water by the people of Southwest Papua are milkfish and tilapia. Tilapia is the most widely cultivated commodity by the community.

In addition to the potential for marine and freshwater fish farming, Southwest Papua also has the beauty of marine tourism in the Raja Ampat Islands. Waigeo and Misool are tourist locations whose names are quite well-known as paradise in eastern Indonesia. Of course, Raja Ampat does not only have scenic tourism, but also hides a variety of interesting marine biota to study. According to Dr. John Veron, a coral expert from Australia, there are at least 450 types of coral in the

waters of Raja Ampat making it one of the best coral areas in Indonesia. Other information from the expert team from Conservation International, The Nature Conservancy, and the National Oceanographic Institute (LON), the Indonesian Institute of Sciences (LIPI) once conducted a rapid assessment in 2001 and 2002. As a result, they noted that in these waters there are more than 540 types of hard coral (75% of the total types in the world), more than 1,000 types of reef fish, 700 types of mollusks, and the highest record for Gonodactyloid Stomatopod Crustaceans. This makes 75% of the world's coral species in Raja Ampat. Some of the locations with the best live coral conditions in Raja Ampat are the waters in the Dampier Strait, Kofi Au Islands, Southeast Misool Islands and Wayag Islands.

To develop the potential of West Papua province, a concept is needed that is able to develop natural potential into added value for the economy, and is able to contribute to the local and provincial economy. One of these concepts is the Blue Economy, this is in line with what was conveyed by Amalia as Deputy for Economic Affairs of the Ministry of National Development Planning/National Development Planning Agency (PPN/Bappenas) that the blue economy is an important key to economic transformation in the Papua region. (Lazuardi, 2023) The blue economy is also one of the national strategy projects in order to achieve the Golden Indonesia economy in 2045.

The development of the blue economy concept has an important role in economic development in the province of Southwest Papua, this is reflected in the conditions in the province of Southwest Papua, where the fisheries sector is one of the main sources of livelihood for the population. The fisheries sector has a fairly large contribution to the

absorption of labor when compared to other economic sectors. This is because people who work in the agricultural sector do not require special expertise and skills and special requirements such as education. Based on the results of the August 2023 Sakernas, Agriculture, Forestry, and Fisheries remain the main fields of employment with the highest percentage of 38.65 percent with a workforce of around 54.66 percent having an elementary school education and not even attending school. Thus, the fisheries and marine sectors should be a shared concern for both the government and the private sector so that they can have a positive impact on the economy while still paying attention to the balance and sustainability of the waters.

The blue economy is an economic concept that aims to create a sustainable economic system, based on the principles of nature and local wisdom. The development of the blue economy was started by Gunter Pauli in 2010, he compared the blue economy with the red and green economy, according to him the red economy focuses more on the exploitation of natural resources that are detrimental to the environment, while the green economy focuses more on sustainable alternative energy but tends to be expensive and exclusive. Meanwhile, the concept of the blue economy is more advanced than the idea of the red and green economy because overall, the blue economy is more environmentally friendly and is committed to transforming the economic system as a whole. This concept not only creates future job opportunities, expands social capital, and drives the economy and people's lives towards sustainability, but also includes spiritual and philosophical values that respect the environment and the earth. (Policy et al., 2023) This concept is reinforced by Gunter Pauli's opinion, which states that "The Blue

Economy must respect the entire ecosystem, and the only safe way to achieve long-term prosperity is through the development of a circular economy."

The blue economy has significant relevance in achieving the UN Sustainable Development Goals (SDGs) in 2030 as well as the regional goals of the State of Indonesia, Blue Economy (BE) Activities include several sustainable development goals (SDGs), including; aiming to conserve and sustainably utilize ocean, sea and marine resources for sustainable development, the Blue economy also contributes indirectly to the SDGs, for example, increasing local investment in ecosystems is expected to support sustainable consumption and production, by providing better and more stable incomes for small communities so that they can overcome various problems of poverty, food insecurity, health and education. The Blue Economy is also a sector that provides opportunities for participation for everyone, supports efforts to encourage sustainable, inclusive and sustainable economic growth, and creates full and productive employment, and decent work for all. In addition, the blue economy pays close attention to the status of women in the coastal tourism, maritime and fisheries sectors, with the aim of improving gender equality and empowering all women and girls

The main objective of the Blue Economy is to strengthen local economic systems and improve people's welfare, by reducing the risk of environmental damage due to excessive exploitation of natural resources. (Kebijakan et al., 2023) The basic principle of the blue economy focuses on the utilization of resources that are rooted in locality, so that the main actors in the blue economy must refer to local

actors such as small and traditional fishermen, local communities, and indigenous peoples in coastal areas and small islands. Although Papua has great blue economy potential, this has received less serious attention, even though this potential can be a driver of economic recovery and growth, especially through the development of the tourism sector which can create new business opportunities and support the local economy. The development of the blue economy concept has a very important role in transforming an inclusive economy for the province of Southwest Papua, but there are several things that need to be studied, including the utilization of blue natural potential has not been carried out optimally, especially for its economic aspects. For this reason, researchers will analyze research development trends related to the Blue Economy, identify gaps in the literature, and offer suggestions for further research.

Literature review

a. Definition of Blue Economy

Gunter Pauli in 2010, said the concept of "Blue Economy" is an economic development idea that considers the wise management of local natural resources by encouraging creativity, innovation, efficiency, and effectiveness without producing waste. According to Law Number 32 of 2014 concerning the Marine Economy, the concept of a blue economy is an approach to improving sustainable marine management and conservation of marine and coastal resources and their ecosystems in order to realize economic growth with the principles of the Blue Economy. (Wibowo et al., 2022)

Blue economy is a sustainable development framework that can provide a positive impact on multidimensional sustainable development

in Indonesia by considering several aspects including; *First* , the economic aspect can be done by improving the safety and efficiency of marine activities, including managing fish catches, maintaining marine security, and preventing increased marine pollution. *Second* , the social aspect must ensure a decent and sustainable livelihood for fishermen, as well as improving the welfare of fishermen. The role of the sea in poverty alleviation can be done by increasing the income of fishermen and sailors, developing the fish processing industry, increasing port efficiency, and expanding access to global markets. In addition, marine potential can also be utilized to encourage the role of women in the economy so as to improve the welfare of coastal communities and fishing communities. *Third*, the blue economy contributes to sustainable development and the environment by cleaning up waters and beaches, reducing air pollution and greenhouse gas emissions from maritime fleets, more responsible tourism and fisheries, and integrating coastal area management. (Pane et al., 2021)

b. Blue Economy Principles

1) Resource Efficiency

Pauli claims that by implementing the blue economy principle, it will save resources, save costs, and less investment. Activities are said to be efficient if their implementation produces maximum output in terms of both quantity and quality. The concept of efficiency includes several things

a) Technical efficiency, namely the process of converting inputs into outputs.

b) Scale efficiency, which is related to achieving economies of scale for units in carrying out their activities; Economies of scale is a concept used to describe the reduction in costs per unit as a result of producing more.
c) Cost efficiency, namely measuring efficiency based on input/output cost information or prices.
d) Allocative efficiency, namely the combination of various inputs to obtain maximum output results.

2) Zero Waste

Clean production is an efficient action in environmental management that is preventive, integrated and continuous in every activity related to the production process, products and services. The goal is to increase the efficiency of the use of natural resources, prevent environmental pollution and reduce waste so as to minimize the risk of environmental damage. The levels of clean production are prevention (*rething* , *elimination*), reduction (*reduce*), use (*reuse*), recycling (*recycle*), recovery (*recovery*), processing (exchange of waste into products). (Bidayani et al., 2016)

3) Social Concern

The indicator used is community empowerment.

4) Production Cycle

The production cycle is a series of business activities to continuously produce products or goods.

5) Investment, Innovation and Adaptation
6) Institutional.

c. Blue Economy Sector

The blue economy concept involving marine and fisheries resources can be applied to several sectors as follows: (“Potential Blue Econ.,” 2017)

Table 2. Blue Economy Sectors

Activity Type	Subcategory Activity	Industry/ Sector	Driving Growth
Fishing and marine resources	Seafood	Fisheries (primary fish production)	Food security
		Aquaculture	Protein Demand
	Marine biotechnology	Pharmaceuticals, Chemicals	R&D for healthcare and industry
Extraction of non-living resources, development of new resources	Mineral	Seabed mining	Mineral demand
	Energy	Oil and Gas	Demand for alternative energy sources
		Renewable energy	
	Freshwater	Desalination	Clean water demand
Trade and commerce in and around the seas	Transportation and trade	Delivery	Growth of seaborne trade:
		Port infrastructure and services	International regulations
	Tourism and Recreation	Tourist	Global tourism growth
		Coastal Development	Coastal urbanization
			Domestic regulations
Response to ocean health challenges	Marine monitoring and surveillance	Technology development and research	Marine technology research and development
	Carbon Sequestration	Blue Carbon	Coastal growth, and marine protection and conservation activities
	Coastal protection	Habitat protection and	

Activity Type	Subcategory Activity	Industry/ Sector	Driving Growth
		restoration	
	Waste Disposal	Assimilation of nutrients and waste	

Method

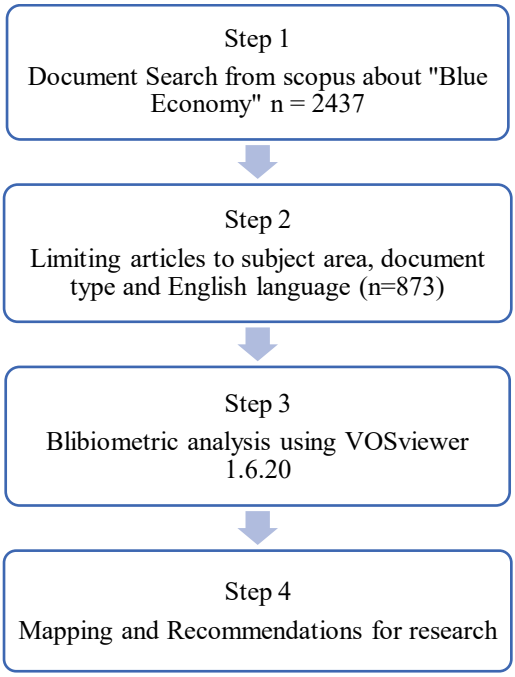
This study uses a mix-method, using a bibliometric approach and literature review. Bibliometric analysis is used to evaluate the development of literature on a topic over a certain period. The data sources in this study are published journal articles obtained from the Scopus database with the keyword "Blue Economy". The period used in the study is the last 10 years from 2015 to 2024. These keywords are selected according to the interests of related researchers and are integrated.

The analytical tools used in this study are the Publish or Perish (PoP) application, Microsoft Excel, and VOSviewer 1.6.20 software. The VOSviewer 1.6.20 application is used because it can help us to identify important patterns and relationships among topics in the vast literature on the "Blue Economy", as well as analyze relevant research trends by utilizing this tool and revealing influential authors and works.

The flow of this research begins with a data search on the Scopus website with the keyword "Blue Economy" then 1939 documents were obtained in journal articles. Then from the article, filtering was carried out by limiting journals in English, subject areas (Social Sciences, Economics, Econometrics and Finance, Business, Management and Accounting, Multidisciplinary, and Multidisciplinary) and types of documents, and we found 873 journal articles.

Furthermore, we downloaded the data in RIS format which we then processed using the VOSviewer 1.6.20 application.

Figure 1. Research Flow



Results and Discussion

1. Results
   a. Data Description

The sample used in this study was 873 articles published by 159 authors from 160 institutions in 104 countries in 20 scientific field categories.

Table 3. Data Description

Category	**Amount**
Article	873
Writer	159

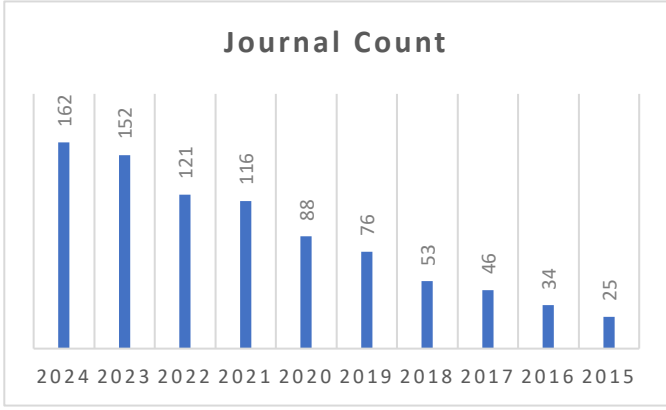
Category	Amount
Institutions	160
Country	104
Subject	20
Source	399

Source: Scopus 2024

b. Number of Articles published from 2015-2024

Based on Figure 1, it can be observed that in the last ten years (2015-2024) the number of articles about the Blue Economy has increased every year starting from 2015 with the number of articles from 25 to 162 articles in 2024.

Figure 2. Number of journals from 2015-2024



c. Analysis Based on research field

Table 4. Number of Journals by Subject

Subject Category	Amount	Percentage
Social Sciences	669	31%
Environmental Science	425	20%
Economics, Econometrics and	238	11%

Subject Category	Amount	Percentage
Finance		
Agricultural and Biological Sciences	170	8%
Business, Management and Accounting	136	6%
Energy	131	6%
Engineering	101	5%
Arts and Humanities	74	3%
Computer Science	70	3%
Multidisciplinary	41	2%

Source: Scopus 2024

Based on table 4 above, it can be seen that the research fields of the publication, 31% of articles focus on the field of social sciences while those that focus on economics only 11% discuss the Blue Economy. So it can be said that studies on the blue economy are still more focused on Social Sciences and Environmental Science .

d. Countries and Institutions that productively research the Blue Economy

Table 5 Number of documents by country

Country	Amount	Country	Amount
United Kingdom	135	Sweden	32
United States	131	Netherlands	28
Australia	79	Indonesia	27
China	78	Norway	27
India	58	France	24
Canada	49	Denmark	23

Country	Amount	Country	Amount
Germany	42	Brazil	21
Italy	41	Malaysia	21
South Africa	38	Bangladesh	19
Spain	38	Finland	19

Source: Scopus 2024

Based on the results of a database search in Scopus, in the last 10 years there have been 104 countries that have published journals on the Blue Economy. Among them, the United Kingdom has published the most journals with 135. Then followed by the United States 131 and Australia 79.

Table 6. Number of Articles by Institute

Institutions	Qty	Institutions	Qty
University of Portsmouth	16	Commonwealth Scientific and Industrial Research Organisation	9
The University of British Columbia	15	Duke University	8
University of Wollongong	15	UiT Norges Arktiske Universitet	8
Lancaster University	14	Lancaster Environment Centre	8
The Australian National University	13	Ministry of Education of the People's Republic of China	7
University of Tasmania	13	The Royal Institute of Technology KTH	7
Wageningen University & Research	11	Southern Connecticut State University	7
Memorial University of Newfoundland	11	Technical University of Denmark	7
The University of Queensland	10	Stanford University	7
Institute for Marine and Antarctic Studies	10	Ocean University of China	7

Source: Scopus 2024

The table above shows that the institutions that publish the most journals on the blue economy out of 160 institutions are:

University of Portsmouth with 16 publications.

e. Blibliometric Analysis of co-Authorship - Author

Co-authorship analysis is a form of analysis used to determine the relationship between authors, both in terms of writing documents and relationships in the form of mutual citation between authors. Based on the co-authorship analysis, the top 10 dominant authors who published articles about Blue Economy were found. Based on individual searches, there was 1 author who was most often found, namely Failler Piere who was able to publish 14 articles.

Table 7. Article Authors

AUTHOR	Document
Failler, P.	14
Fabinyi, M.	6
Hicks, CC	6
Voyer, M.	6
Allison, E.H.	5
Knott, C.	5
Bennett, NJ	4
Cisneros-Montemayor, A.M.	4
Contreras-Barraza, N.	4
Germond-Duret, C.	4

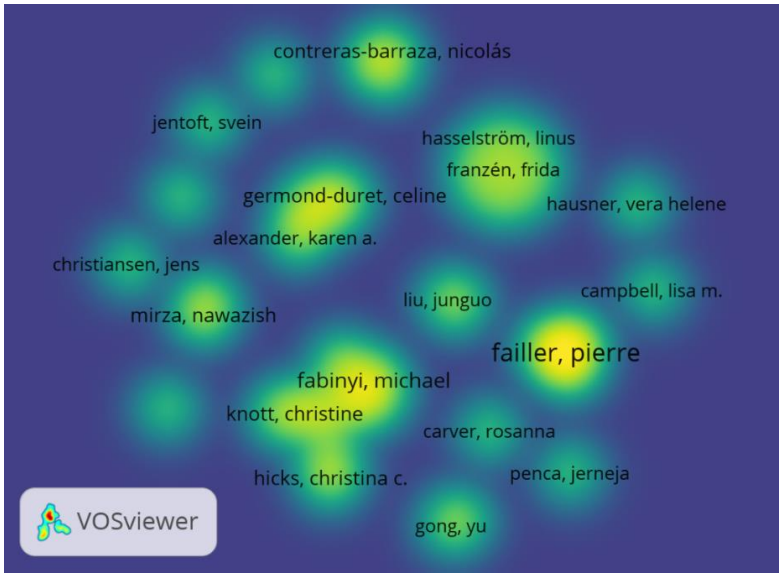


Figure 4. VOSviewer schema for publication authors

Next, we found authors whose writings were cited, as shown in the following table:

Table 8. Number of frequently cited authors

AUTHOR	Document	Citations
Campbell, L.M.	3	393
Voyer, M.	6	261
Bueger, C.	3	255
Cisneros-Montemayor, A.M.	4	245
Liu, J.	3	181
Hicks, CC	6	176
Zhao, D.	3	155
Failler, P.	14	154
Allison, E.H.	5	154
Okafor-Yarwood, I.	4	148

f. Citation Analysis

1) Document

This analysis was conducted to find out which articles had been cited by researchers. This analysis is also used to identify similarities and differences with studies related to the blue economy. Based on the results of the citation-document analysis, it was found that there were 10 articles that were most cited by researchers, including:

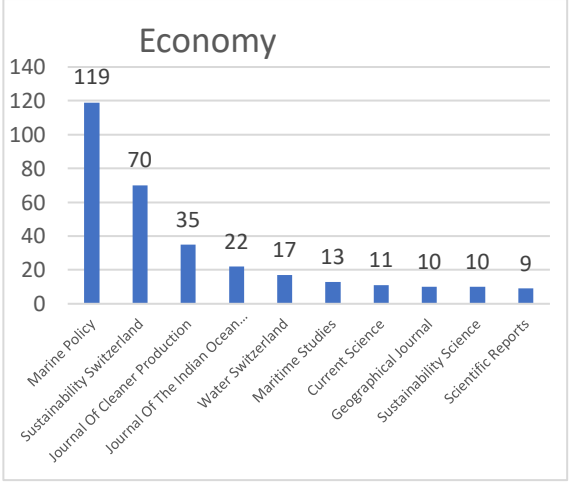
Table 9. Frequently Cited Articles

Author	Title	Amount	Journal
(Silver et al., 2015)	Blue Economy and Competing Discourses in International Oceans Governance	306	The Journal of Environment & Development
(Nathan James Bennett & Campero, 2021)	Blue growth and blue justice: Ten risks and solutions for the ocean economy	231	Marine Policy
(Bueger, 2015)	What is maritime security?	224	Marine Policy
(Novais et al., 2018)	Biomass fly ash geopolymer monoliths for effective methylene blue removal from wastewaters	222	Journal of Cleaner Production
(Kronenberg et al., 2020)	Environmental justice in the context of urban green space availability, accessibility, and attractiveness in postsocialist cities	195	Cities
(Bennett, 2018)	Navigating a just and inclusive path towards sustainable oceans	168	Marine Policy

Author	Title	Amount	Journal
(Smith-Godfrey, 2016)	Defining the Blue Economy	140	Maritime Affairs: Journal of the National Maritime Foundation of India
(Andrés M. Cisneros-Montemayor, 2021)	Enabling conditions for an equitable and sustainable blue economy	135	Nature
(Meg R. Keen et al., 2018)	Towards defining the Blue Economy: Practical lessons from Pacific Ocean governance	135	Marine Policy
(Clapp et al., 2018)	The global political economy of climate change, agriculture and food systems	134	The Journal of Peasant Studies

2) Journal

Figure 6. Journal where the article was published



Source: Scopus 2024

Another aspect studied is the Journal that published the articles. In this context, based on Figure 6, there are 10 Journals that publish the most journals related to Blue Economy, in the first position is the Marine Policy journal which published 119 articles and then followed by the Sustainability Switzerland journal which published 70 articles. Next, the journal that published the least is Economy Of Regions.

Table 6. Frequently cited journals

Source	Citations	Document
marine policy	3194	119
journal of cleaner production	1187	35
sustainability (switzerland)	863	70
journal of the indian ocean region	359	22
journal of environment and development	331	4
dialogues in human geography	253	7
journal of political ecology	223	8
sustainability science	213	10
maritime affairs	188	7
scientific reports	184	9

Based on table 6, it shows that the journals above have special attention in this field. The more frequently a journal is cited, the higher the recognition of researchers that the journal is of high quality and has made a significant contribution to the development of science. Citation analysis of Sources is very helpful for

researchers to find articles related to their research and can be a quality reference for the researcher.

Of the 399 journals, there are 10 journals that are most cited related to the Blue Economy study, where the journal Marine Policy 3194 is the most cited journal, followed by the Journal of Cleaner Production with 1187 citations. The journals above occupy an important position in the field of blue economy research. Academics can focus on high-quality academic findings published in these journals,

g. Co-Ocurrence Analysis

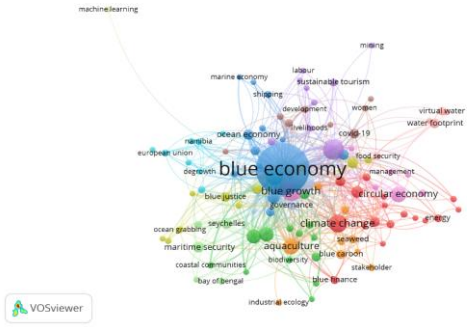
The frequency of keywords to be found in this study was used 4 times, resulting in 116 related terms. After that, less relevant keywords were removed, resulting in 109 terms related to the concept of the blue economy and divided into 13 clusters, including the following:

1) Cluster 1; adaptation, bliblimetric analysis, blue finance, blue ocean strategy, blu-green infrastructure, climate change, coastal tourism, competitiveness, decarbonization, ecosystem service, efficiency, energy, entrepreneurship, maritime transport, resilience, tourism, and transformation.
2) Cluster 2; Baltic sea, biodiversity, coastal communities, coastal management, innovation, marine conservation, marine spatial planning, maritime spatial planning, nature based solutions, ocean governance, ocean sustainability, SDGS, sustainable blue economy.

3) Cluster 3; blue economy, Caribbean, economic growth, mariculture, marine economy, marine resources, ocean economy, oceans, sdg 14, shipping, sids, small island developing state, sustainable development goals.
4) Cluster 4; bioeconomy, blue justice, environmental governance, environmental justice, geopolitics. Green economy, ocean grabbing, plotical ecology, political economy, small-scale fisheries.
5) Cluster 5; Community development, environment, equity, justice, labor, livelihoods, mining, sustainability, sustainable tourism.
6) Cluster 6; blue degrowth, blue hydrogen, degrowth, European union, fisheries, Namibia, neoliberalism, ocean, seabed mining.
7) Cluster 7; aquaculture, blue bioeconomy, blue carbon, chile, industrial ecology, renewable energy, risk, seaweed, stakeholders
8) Cluster 8; covid-19, development, employment, maritime operations phakisa, pandemic, policy women
9) Cluster 9; adsorption, blue growth, circular economy, conservation, management, marine, marine litter,
10) Cluster 10; blue water, food security, virtual water, water print, water scarcity
11) Cluster 11; bay of Bengal, Indian ocean , iuu fishing, maritime security, seychelles.
12) Cluster 12; governance, marine governance, sustainable development.

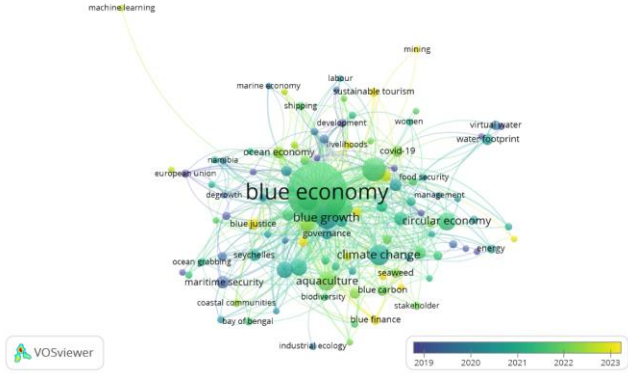
13) Cluster 13; machine learning

Terms in a cluster have a strong relationship between terms, in other words, in a journal these terms are often found together or studied together. To analyze keywords, there are three types of data mapping visualizations in the Vos Viewers application, namely network visualization (see Figure 4), density visualization Network Visualization isualization (see Figure 5), and overlay visualization (see Figure 6). [Hamidah : 2020].

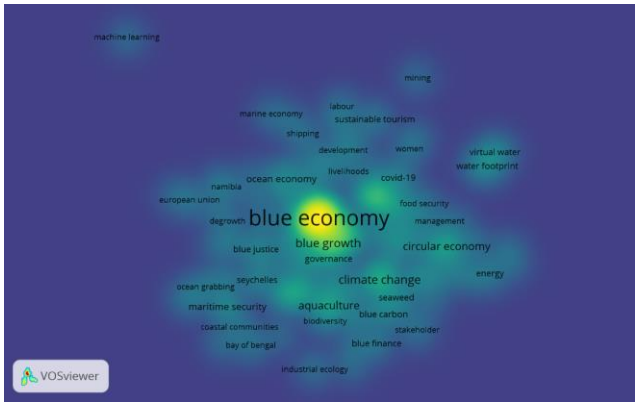


Mapping using the VOSviewer application on network visualization, each term is displayed in the form of a circle with a different color in each cluster. This is to make it easier for researchers to find terms that are the focus of research. The size of the circle for each term varies, some are small, medium or large. The size is determined by the number of frequencies of occurrence of each term. The more often the term is found, the larger the label size based on the image above, network visualization shows that the

blue economy is closely related to sustainable development goals, mariculture, sids, small island developing states, ocean economy, economic growth, Caribbean, marine economy, marine resources, shipping.



The overlay visualization image shows research related to the blue economy from 2015 to 2024, on the overlay visualization map the term Blue economy is bright green, meaning the brighter the color, the newer the research.



In the Density Visualization map image, the term blue economy is bright yellow, this shows that

blue economy is the most frequently used keyword in a journal. Then followed by sustainable development, sustainability, economic growth, marine environment, and governance approach.

Conclusion

Based on the results of the study above, it can be concluded that network visualization shows that blue economy is closely related to sustainable development goals, mariculture, sids, small island developing states, ocean economy, economic growth, Caribbean, marine economy, marine resources, shipping. In addition, on the overlay visualization map, the term Blue economy is bright green, meaning that the brighter the color, the newer this research is. Finally, the Density Visualization map of the term blue economy is bright yellow, this shows that blue economy is the most frequently used keyword in a journal. Then followed by sustainable development, sustainability, economic growth, marine environment, and governance approach.

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