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Research Trend Of Coastal Livelihood System In The Last Decade: A Systematic Review And Bibliometric Analysis

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ABSTRACT

The developing number of publications related to coastal livelihood system in the last decade have significantly grown. To date, however, a study offering the comprehensive information related to the coastal livelihood system has not been conducted and also found in the electronic journal or proceeding. The purpose of this study is to present a bibliographic and bibliometric review of the numerous documents studying the coastal livelihood system. A systematic review involving bibliometric analysis was performed to carry out this study in which 198 eligible documents from Scopus database published in the period of 2013 – 2022 were used as research materials. Results revealed that the publication development of studies related to the inhabitants' coastal livelihood system slightly soared from 2013 until 2022. Meanwhile, the citation development on the studies regarding the coastal livelihood system tended to moderately decrease between 2013 and 2022. Additionally, the productive and influential documents, authors, countries, affiliations, and sources contributed to the development of studies related to the coastal livelihood system. Moreover, some authors such as Islam, M. M., Rahman, M. A., and Hasan, M., and some countries such as United Kingdom, United States, Australia, India, and Bangladesh were the leading authors and countries generating the networking researches regarding the coastal livelihood system. Furthermore, most of the coastal people make beach tourism, fisher,

and farmer as the livelihood system in the coastal zone. This study implies that the government must make the policy supporting the sustainable livelihood system of the coastal communities.

Keywords: Bibliometric analysis; coastal livelihood system; Scopus; sustainable livelihood; systematic review.

Introduction

Sustainable livelihoods become an important part of sustainable development to achieve three purposes such as environment, economics, and social. It represents the ability to recover and cope the stress and improve the capacity and resource (Syukron, 2021). Moreover, the concept of sustainable livelihood involves promoting sustainable development, increasing people's participation, and poverty alleviation because it incorporates natural, economic, physical, and social indicator and also the environmental aspect (Smith et al., 2013). Furthermore, sustainable livelihood aims to reduce the vulnerability of the people's communities, keep the food security, and relieve the poverty (Ferrol-Schulte et al., 2013). As a consequence, the economic sustainability of the people in many countries will continue in the disruptive condition such as abnormal climate and changeable weather (Sweileh, 2020). Particularly in the coastal area, sustainable livelihood also has to be considered by the regional government mainly. It interprets that the government has to have a concern regarding how to create, facilitate, and promote the livelihood system for the coastal people so that the livelihood system can increase the economic revenue of coastal inhabitants.

The profitable livelihood system of coastal communities will soar coastal people's income in which it increases the standard of economic living representing the welfare of coastal people (Benessaiah & Sengupta, 2014; Jimenez et al., 2021; Wood et al., 2013). There are several forms of coastal livelihood that coastal inhabitants can conduct and develop to sustain their life. Some studies reported that beach tourism is one of the promising businesses that coastal communities can generate and organize independently or jointly with the regional government (Arefipour et al., 2022; Ávila-Foucat et al., 2021; Hoefle, 2014; Lazzari et al., 2021). Moreover, Ávila-Foucat et al. (2021) revealed that specifically the coastal people can provide various foods like sea foods for the tourists in which it interests them and also gives additional incomes for the coastal communities. In addition, the provision of some facilities for the visitors to play in the beach such as boat, surfing board, and diving equipment also can be a revenue for the coastal inhabitants (Lazzari et al., 2021). Then, Arefipour et al. (2022) also argued that a few of facilitations built by the coastal societies to stay around the beach

such as hotel and lodge can give the earnings for them. This shows that there are various sources of the beach tourism as one of livelihood system of the coastal people.

Furthermore, several studies also revealed that sailor or fisherman is one of the main jobs of the communities who live in the coastal area (Huynh *et al.*, 2021; Montes *et al.*, 2019; Santha *et al.*, 2014; Sharifuzzaman *et al.*, 2018). To be a sailor or fisherman, the coastal people can fulfil their daily economic needs. This implies that it can support them in sustaining their life. Huynh *et al.* (2021), however, stated that unpredictable climate change affects the activities in searching and catching the marine biotas such as fish, shrimp, crab, and squid in which the bad weather will disturb and even thwart the sailing process. Hereinafter, a few of studies showed that some coastal residents work as the farmer who manage fish, coconut, salt, and sago (Hossain *et al.*, 2018; Kramer *et al.*, 2017; Kriegl *et al.*, 2022). Moreover, Kramer *et al.* (2017) explained that the need of salt to fill the nationally economic need requires the role of salt farmer in producing a lot of salts. In addition, Hossain *et al.* (2018) argued that the production of coconut from the coastal region mostly supplies the coconut need of urban dwellers. This presents that the job as sailor or fisher and also farmer in the coastal zone is the forms of coastal livelihood system carried out by the coastal communities to require their economic need in sustaining their life.

The developing number of publications related to coastal livelihood system in the last decade have significantly grown in which those publications certainly provide a lot of information regarding the kinds of livelihood system of the coastal communities. To date, however, a study offering the comprehensive information related to the coastal livelihood system has not been carried out and also found. Moreover, the recently academic review papers published in several electronic journals only concern on sustainable livelihood in general (Pereyra-Mariñez *et al.*, 2022; Shen *et al.*, 2008; Syukron, 2021; Zhang *et al.*, 2019; Zhong *et al.*, 2022). In addition, some review papers only focus on social-ecological system in coastal and marine zone (Duan *et al.*, 2022; Ferrol-Schulte *et al.*, 2013; Jiang & Fan, 2022; Msimanga & Mukwada, 2022; Sharma & Rao, 2021). This indicates that the documenting research reviewing systematically numerous relevant literatures related to the people's livelihood system in the coastal zone has to be conducted in which this systematically documenting study provides lots of new information regarding the trends of livelihood system researches of coastal communities in the last decade specifically from 2013 until 2022.

This currently systematic review study aims to present and inform a bibliometric and bibliographic review related to many relevant

literatures focusing on the people's livelihood system in the coastal area from Scopus database in the last decade. To review systematically the large documents, the use of bibliometric analysis can enrich in providing the visual and biometric information and presentation of the trends of coastal livelihood system studies (Fuad et al., 2022). In particular, this study presents the development of publication and citation of coastal livelihood system researches in the last decade. Moreover, this study also presents the most productive and influential documents, countries, authors, institutions, and sources related to the researches of coastal livelihood system. In addition, this study maps the forms of people's livelihood system in the coastal zone by visualizing the most frequently appearing keywords related to coastal livelihood system researches. Then, this study also visualizes the social interactions among authors and author's countries regarding the researches of coastal livelihood system. All results of this study are projected to identify the possible research novelty in the field of sustainable livelihood in the coastal zone, strengthen and broaden the comprehensive knowledge base of coastal livelihood system, and explore the trends in the development of coastal livelihood system researches.

Method

To present and inform bibliographic and bibliometric review of a lot of relevant literatures related to the livelihood system of coastal communities published in the last decade, a systematic literature review using the bibliometric analysis was performed. Donthu et al. (2021) stated that bibliometric analysis help derives to identify knowledge gaps and find the research novelty in the certain scientific field. A few of literatures proposed that there were five steps in conducting bibliometric analysis that were: (1) specifying the search keyword, (2) exploring initial search results, (3) refining the documents, (4) compiling the initially statistical data, and (5) analysing the data (Fuad et al., 2022; Muhammad et al., 2022). In detail, each of step in carrying out the bibliometric analysis in this study was explained in the following subsections.

Specifying the Search Keyword

Scopus database was used to the documents which studied the people's livelihood system in the coastal zone. Some literatures revealed that Scopus database has a lot of electronically well-qualified scientific papers from numerous scientific field (Burnham, 2006; Montoya et al., 2018; Zhu & Liu, 2020). To find the prospective documents which was suitable to the topic of livelihood system in the coastal communities, the certain keyword was established in which it was "coastal livelihood". The search process of documents in the Scopus database using the keyword "coastal livelihood" was

conducted in December 8th, 2022, particularly on 6.25 PM in Western Indonesian Time.

Exploring Initial Search Results

The initial search process using the keyword “coastal livelihood” found 847 documents consisting of article, book chapter, conference paper, review, editorial, book, note, short survey, and letter. The documents were published in the period of 1987 – 2022 in which most of documents had been published by the publishers and also some documents still had the status of publication stage in press. Furthermore, the documents were written in few languages such as English, Chinese, Japanese, Portuguese, French and Russian. Moreover, the documents were found from various sources such as journal, book, conference proceeding, and book series.

Refining the Documents

To acquire the documents which was suitable to the topic of coastal livelihood system, they had to be refined by considering the established inclusion criteria. There were several inclusion criteria of this systematic literature study. Firstly, the document was published in the period of 2013 – 2022. Secondly, the document was only written in English. Thirdly, the document was only got from the journal. Fourthly, the type of document was only in article. Fifthly, the publication stage status of document was in final. The documents which did not fulfil the inclusion criteria were excluded from this study. A few of literatures stated that there were four stages in refining the documents systematically that were: (1) identification, (2) screening, (3) eligibility, and (4) inclusion (Fuadi et al., 2021; Jaya & Suparman, 2021; Juandi et al., 2022; Suparman et al., 2022; Suparman & Juandi, 2022a, 2022b). The process of document refinement systematically is presented in Figure 1.

Compiling the Initially Statistical Data

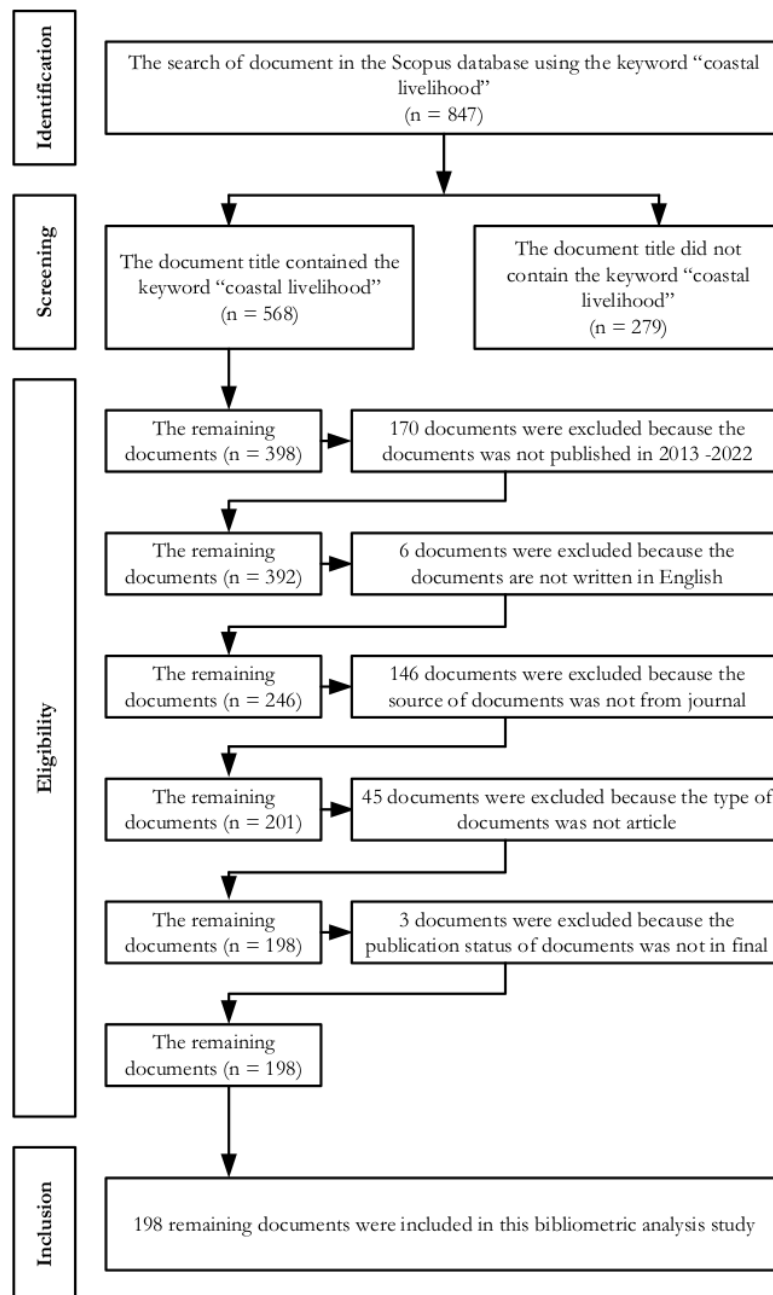
The eligible documents were downloaded from the Scopus database in some formats such as Comma Separated Values (CSV) and Research Information System (RIS). Muhammad et al. (2022) argued that the formats contain several essential information such as bibliographical information, abstract and keyword, and bibliometric information. Moreover, the data presentation in RIS format utilizing the software of Perish or Publish (PoP) could provide the raw statistics data such as number of document citations, author names, document titles, publication years, document sources, publishers, and document types (Fuad et al., 2022). Additionally, the appearance of PoP software presented the descriptive analysis summary such as the total of publication (TP), the total of citation (TC), the number of citations per year (NCY), the number of citations per publication (NCP), the number

of authors per publication (NAP), h-index, g-index, and the period of publication and citation years (Muhammad et al., 2022). Meanwhile, the data presentation in CSV format utilizing the software of VOSviewer could display the most numerous publication and citation viewed from the unit of document, author, country, source, and institution. Moreover, the appearance of VOSviewer software presented the keyword occurrence, total of strength link, some visualizations, and clustering (Fuad et al., 2022).

Analysing the Data

There were some analyses used to analyse the data of this study such as performance analysis, science mapping, and network analysis (Donthu et al., 2021). Moreover, Donthu et al. (2021) itemized that science mapping consists of citation analysis, co-citation analysis, bibliographic coupling, co-word analysis, and co-authorship analysis while network analysis consists of network metrics, clustering, and visualization. To present the development of publication and citation of coastal livelihood system researches in the last decade, the performance analysis was used in which it was supported by PoP software in analysing the data. In addition, the citation analysis was performed to present the most productive and influential documents, countries, authors, institutions, and sources related to the researches of coastal livelihood system. Moreover, the co-word analysis was used to map the forms of people's livelihood system in the coastal zone by visualizing the most frequently appearing keywords related to coastal livelihood system researches in which this analysis was enriched by visualization analysis and hierarchical clustering analysis. Then, to visualize the social interactions among authors, and author's countries regarding the researches of coastal livelihood system, the co-authorship analysis was performed in which this analysis was enriched by the network visualization analysis. Some analyses such as citation analysis, co-word analysis, and co-authorship analysis were supported by VOSviewer software (van Eck & Waltman, 2010).

Figure 1. The refinement process of documents



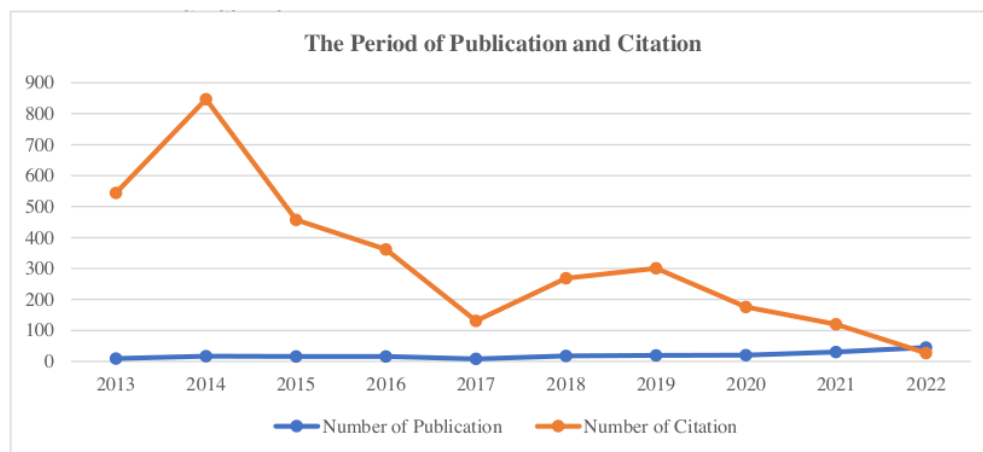
Results

The results of the following data analysis outputs present the trend of studies related to inhabitants' livelihood system in the coastal zone consisting of performance analysis, citation analysis, co-word analysis, and co-authorship analysis.

Performance Analysis

This analysis was performed to present the development of publication and citation of studies regarding people's livelihood system in the coastal area in the period of 2013 – 2022. The publication and citation report of coastal livelihood system studies are presented in Figure 2.

Figure 2. Publication and citation report of studies regarding coastal



Citation Analysis

This analysis was performed to present the most productive and influential documents, countries, authors, institutions, and sources related to the researches of coastal livelihood system. Firstly, top five most influential documents of studies regarding the communities' livelihood system in the coastal zone are shown in Table 1.

Table (1) The top five most cited documents on coastal livelihood system

No	Title	Author	Source	Citation	Year
1	"The role of ecosystems in coastal protection: Adapting to climate change and coastal hazards"	Spalding et al	Ocean and Coastal Management	331	2014
2	"A localized disaster-resilience index to assess coastal communities based on an analytic hierarchy"	Orencio & Fujii	International Journal of Disaster Risk Reduction	157	2013

3	"Vulnerability of fishery-based livelihoods to the impacts of climate variability and change: Insights from coastal Bangladesh"	Islam et al	Regional Environmental Change	146	2014
4	"The end of the pacific? Effects of sea level rise on pacific island livelihoods"	Nunn	Singapore Journal of Tropical Geography	94	2013
5	"Coastal vulnerability assessment studies over India: A review"	Sudha et al	Natural Hazards	93	2015

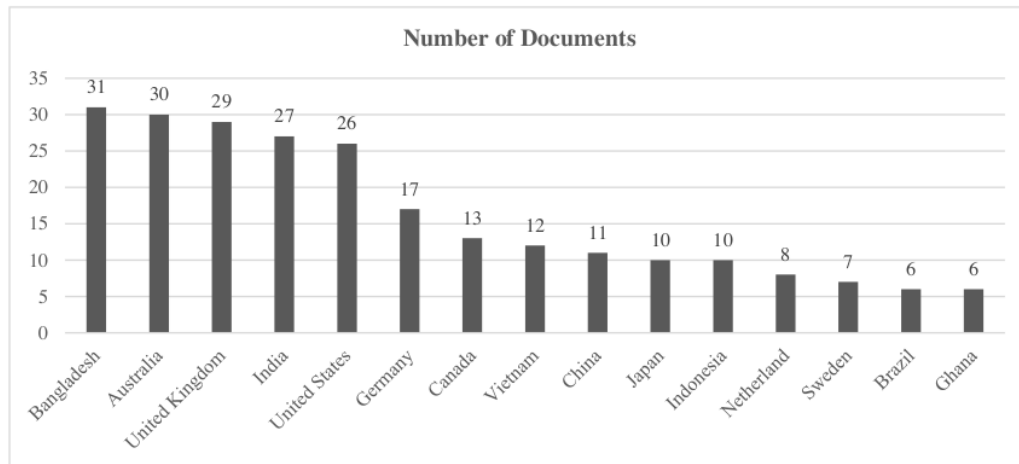
Secondly, the top five most productive and influential authors who wrote the documents related to the coastal livelihood system studies are shown in Table 2.

Table (2) The top five most productive & cited authors of coastal livelihood system studies

Top Five Most Productive Authors			Top Five Most Influential Authors		
Author	Publication	Organization	Author	Citation	Organization
Islam, M. M	5	University of Leeds	Lacambra, C	333	University of Cambridge
Jiiddawi, N. S	3	University of Dar es Salaam	Beck, M. W	331	University of California
Kramer, D. B	3	Michigan State University	Hale, L. Z	331	Global Marine Team
Williams, N. E	3	California Polytechnic State University	Meliane, I	331	Global Marine Team
Vijayan K. K	3	Institute of Brackishwater	Ruffo, S	331	Global Marine Team

Thirdly, the top fifteen most productive countries which studied and published the documents related to the coastal livelihood system are presented in Figure 3.

Figure 3. The top 15 most productive countries on the coastal livelihood system



Furthermore, the top fifteen most influential countries regarding the coastal livelihood system studies are presented in Figure 4.

Figure 4. The top 15 most influential countries on the coastal livelihood system

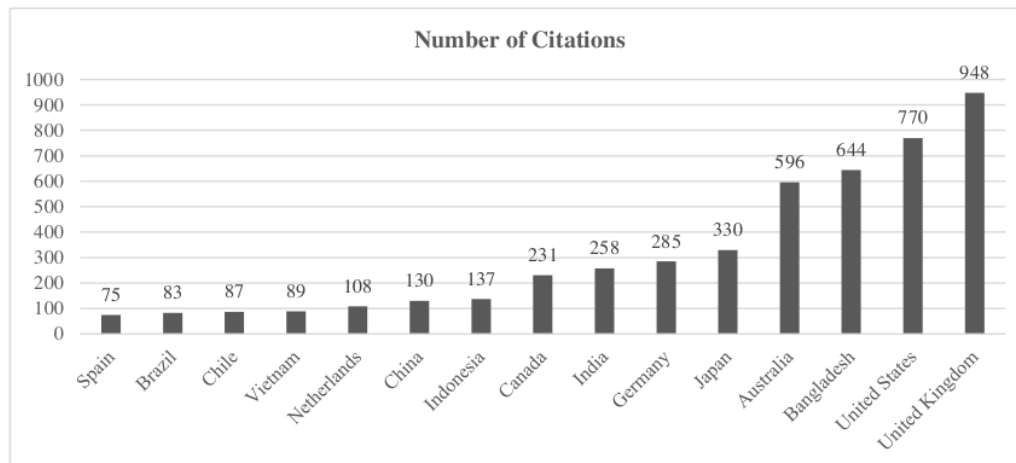


Table (3) The top five most productive sources on the coastal livelihood system

Source	Number of Publications	Subject Categories	Journal Quartile Ranking
Ocean and Coastal Management	23	Agriculture and Biological Sciences	Q1
		Earth and Planetary Sciences	Q1
		Environmental Science	Q1
Ecology and Society	11	Environmental Science	Q1
Marine Policy	7	Social Sciences	Q1

		Agricultural and Biological Sciences	Q1
		Economics, Econometrics and Finance	Q1
		Environmental Science	Q1
Frontiers in Marine Science	7	Environmental Science	Q1
		Agricultural and Biological Sciences	Q1
		Earth and Planetary Sciences	Q1
		Engineering	Q1
Science of the Total Environment	6	Environmental Engineering	Q1
		Pollution	Q1
		Waste Management and Disposal	Q1
		Environmental Chemistry	Q1

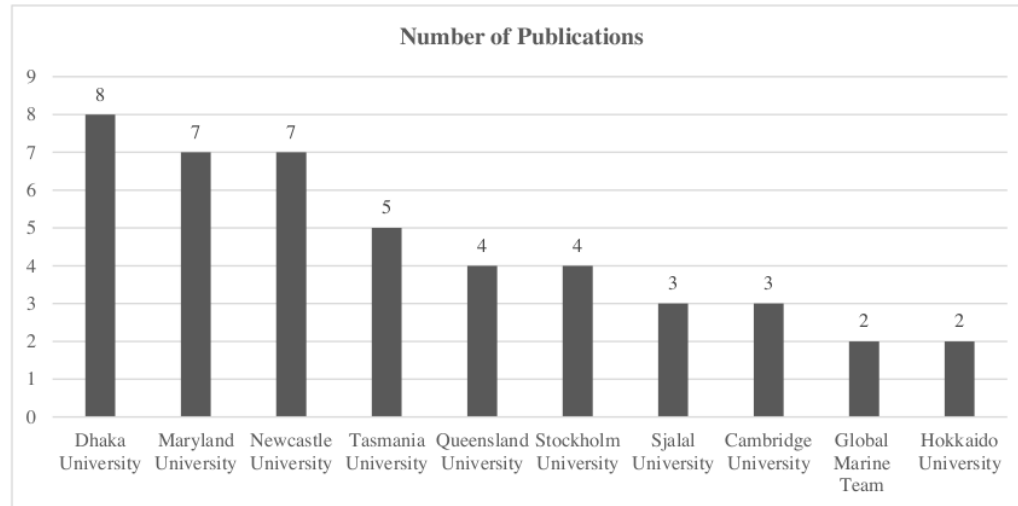
Furthermore, the top five most influential sources on the studies of the coastal livelihood system are shown in Table 4.

Table (4) The top five most influential sources on the coastal livelihood system

Source	Number of Citations	Subject Categories	Journal Quartile Ranking
Ocean and Coastal Management	653	Agriculture and Biological Sciences	Q1
		Earth and Planetary Sciences	Q1
		Environmental Science	Q1
International Journal of Disaster Risk Education	171	Social Sciences	Q1
		Earth and Planetary Sciences	Q1
		Engineering	Q1
Ecology and Society	159	Environmental Science	Q1
Regional Environmental Change	158	Environmental Science	Q1
Natural Hazards	140	Earth and Planetary Sciences	Q1

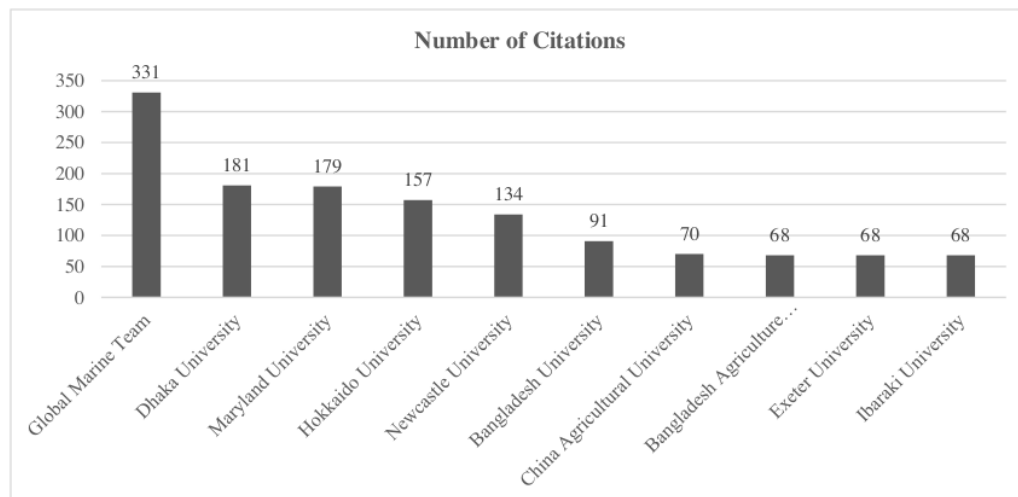
Fifthly, the top ten most productive institutions on the studies regarding people's livelihood system in the coastal zone are presented in Figure 5.

Figure 5. The top 10 most productive institutions on the coastal livelihood system



Furthermore, the top ten most influential institutions regarding the studies of coastal livelihood system are presented in Figure 6.

Figure 6. The top 10 most influential institutions on the coastal livelihood system



Co-authorship Analysis

This analysis was performed to visualize the social interactions among authors, and author's countries regarding the researches of coastal livelihood system. Firstly, the visualization of social interactions among authors is presented in Figure 7 in which there were 35 interconnected authors who emerged by selecting the minimum number of documents of an author as many as one document and the minimum number of citations of an author as many as no citation.

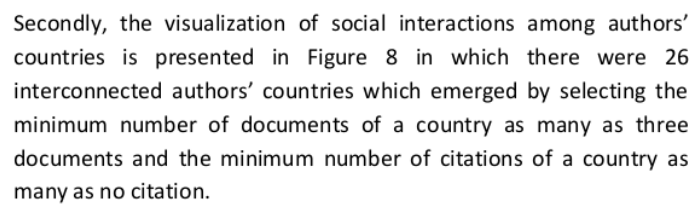
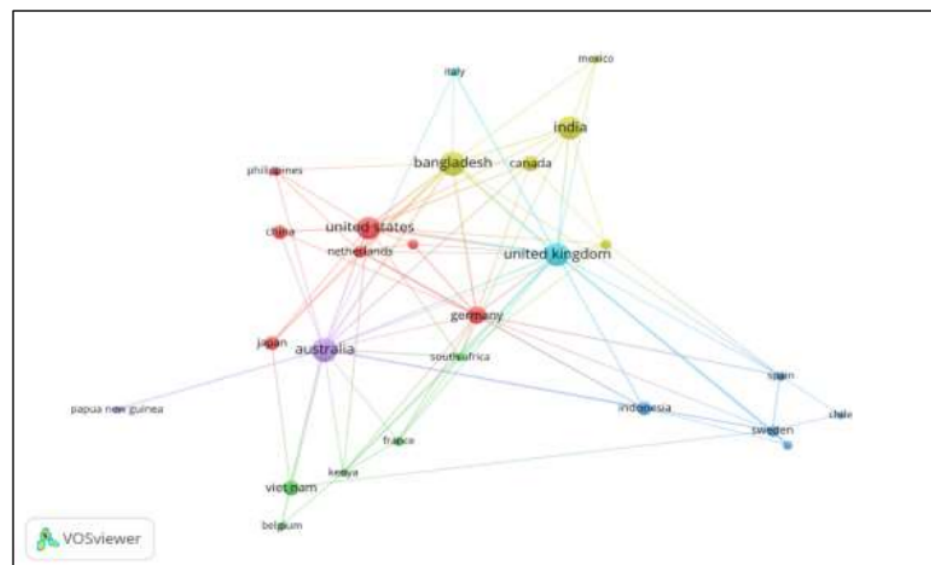


Figure 8: The social interactions among authors' countries on the coastal livelihood system studies



Co-word Analysis

This analysis was performed to map the forms of people's livelihood system in the coastal zone by visualizing the most frequently appearing keywords related to coastal livelihood system researches. By selecting the minimum number of occurrences of a keyword as many as two occurrences, 74 interconnected keywords emerged (See Figure 9).

Figure 9: The network visualization of the emerging keywords on coastal livelihood system

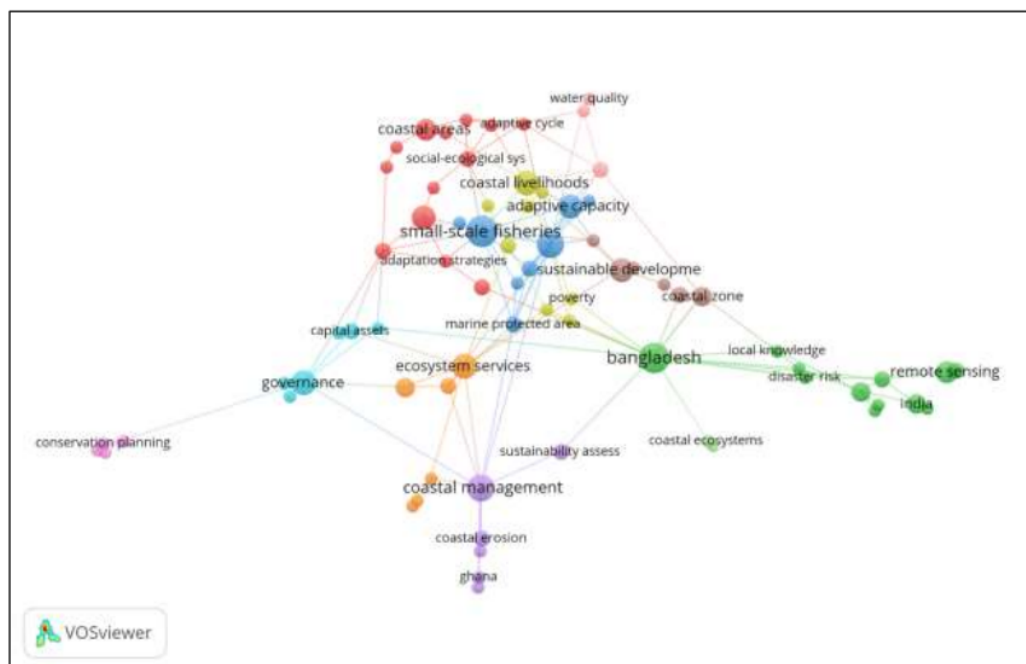


Figure 9 presents that 74 emergently interconnected keywords related to the coastal livelihood system studies were grouped to eleven clusters such as red, green, yellow, blue, orange, purple, brown, blue-sky, pink, green light, and pink light. Moreover, the hierarchical clustering analysis was performed to show the frequency of each keyword on the coastal livelihood system (See Table 5).

Table (5) The hierarchical clustering analysis of keywords on the coastal livelihood system

Cluster	Keyword	Frequency	Total Link Strength
Red	Social-Ecological Systems	8	24
	Coastal Communities	6	8
	Coastal Areas	5	7
	Livelihood Resilience	3	3
	Vulnerability Assessment	3	9
	Adaptation Strategies	2	25

	Adaptive Cycle	2	7
	Shrimp Aquaculture	2	5
	Agriculture	2	4
	Salinity	2	4
	Social Capital	2	4
	Geographic Information System	2	3
	Livelihood Vulnerability Index	2	2
Green	Bangladesh	10	27
	Remote Sensing	5	9
	India	4	13
	Coastal Hazards	4	12
	Risk Assessment	3	8
	Western Indian Ocean	3	3
	Early Warning	2	8
	Local Knowledge	2	7
	Tuticorin Coast	2	6
	Sea Level Rise	2	6
	Disaster Risk	2	5
	Traditional Ecological Knowledge	2	5
Blue	Small-Scale Fisheries	11	22
	Adaptive Capacity	6	13
	Marine Protected Areas	3	11
	Collective Action	3	8
	Fisheries Management	2	5
	Diversification	2	4
	Political Ecology	2	4
	Social-Ecological Systems	2	4
Yellow	Coastal Livelihoods	7	16
	Biodiversity	3	6
	Poverty	2	8
	Coastal Fishery	2	6
	Fishermen	2	6
	Sea Cucumbers	2	5
	Bay of Bengal	2	4
	Mariculture	2	4
Purple	Coastal Management	8	19
	Coastal Erosion	3	5
	Sustainability Assessment	3	3
	Shoreline Change	2	5
	Ghana	2	3
	Socio-Economic Factors	2	1
Blue-sky	Governance	7	21
	Capital Assets	3	10
	Climate Variability	2	9

	Egypt	2	4
	Livelihood Diversity	2	3
	Coastal Systems	2	1
Orange	Ecosystem Service	7	15
	Food Security	4	12
	Climate Change Adaptation	3	6
	Livelihood Assets	2	4
	Caribbean	2	4
	Fishing Community	2	3
Brown	Sustainable Development	6	10
	Coastal Zone	4	7
	Livelihood Security	3	5
	Seagrass Meadows	2	5
	Small Islands	2	5
	Rainwater Harvesting	2	3
Pink	Coral Triangle	2	9
	Conservation Planning	2	3
	Indonesia	2	3
	Marine Spatial Planning	2	3
Pink Light	Vietnam	3	8
	Coastal Lagoon	2	6
	Water Quality	2	3
Green Light	Coastal Ecosystems	2	5
	Tourism	2	3

Discussion

The Development of Publication and Citation of the Studies Regarding the Coastal Livelihood System

The report shows that the development of publications related to the livelihood system of the coastal communities slightly soared from 2013 to 2022. This indicates that the researches focusing on the sustainable livelihood of the coastal inhabitants develop gradually in the last decade. This report is line to Zhang et al. (2019) revealing that the development of publications of the studies related to global sustainable livelihood sharply increased in the period of 1997 – 2017. Additionally, Duan et al. (2022) reported that the publication development of the studies regarding coastal and marine tourism also sharply raised between 1990 and 2020. Moreover, Syukron (2021) also reported that the development of publications of the studies regarding sustainable livelihoods of indigenous community tended to sharply jump in the period of 2000 – 2020. These reports prove that the publication of the studies related to sustainable livelihood of communities who live particularly in the coastal zone develops gradually in the mainly last decade.

Meanwhile, another report shows that the development of citation on the studies related to the people's livelihood system in the coastal areas tended to decrease moderately in the period of 2013 – 2022. This interprets that the recently published documents are less cited by other relevant documents than the anciently published documents. Zhang et al. (2019), however, revealed that the development of citations on the studies regarding the global sustainable livelihood sharply jumped in the period of 1992 – 2017. Moreover, Sharma and Rao (2021) reported that the development of citations on the studies related to climate vulnerability assessment and livelihood resilience of coastal communities slightly increased from 2011 until 2019. This shows that the previous reports contrast to this current study report. This is due to this recent study specifically focuses on the livelihood system of the coastal communities while other previous studies generally focus on sustainable livelihood, climate vulnerability, and livelihood resilience.

The Most Productive and Influential Documents, Authors, Countries, Sources, and Institutions on the Studies of Coastal Livelihood System

The document entitled "The role of ecosystems in coastal protection: Adapting to climate change and coastal hazards" was the most influential document which studied the people's livelihood system in the coastal zone. This shows that the most influential paper studies the effect of ecosystems on coastal protection in which some factors such as climate change and coastal hazards can be the problems for the coastal communities so that the balancing ecosystems must be generated to protect the sustainability of inhabitants' livelihood system. According to Sweileh (2020), the climate change had a significant impact on the food security in which the global challenge emerged as the effect of climate change on the food security. Moreover, Msimanga and Mukwada (2022) revealed that the climate change affects the sustainable rural livelihoods. These reports show that the climate change is one of the essential factors that can obstruct the sustainable livelihood system of the coastal communities. Therefore, the government has to create the adaptation plans and policies to employ effective and sustainable livelihood system of the coastal inhabitants in the face of disruptive climate change.

Islam, M. M, an author affiliated in Leeds University was the most productive author who had published five papers related to the inhabitants' livelihood system in the coastal zone. Zhang et al. (2019) also reported that the author who has the affiliation in University of Leeds is the most productive author who has published twelve documents regarding global sustainable livelihood research. Additionally, Lacambra, C, an author affiliated in Cambridge University

was the most influential author on the studies related to the coastal livelihood system. Both Leeds University and Cambridge University located in United Kingdom. This indicates that the authors coming from United Kingdom are the most productive and influential authors on the studies of coastal livelihood system. Duan et al. (2022) also reported that the author who come from United Kingdom is the most productive and influential author on the studies related to coastal and marine tourism. Moreover, this study also revealed that United Kingdom was the most influential country on the studies regarding the coastal livelihood system. In contrast, Duan et al. (2022) reported that United States of America was the most influential country on the studies of coastal and marine tourism. Additionally, Zhang et al. (2019) reported that United States of America was also the most productive country which had published 557 papers related to the global sustainable livelihood research. Meanwhile, this study showed that Bangladesh was the most productive country on the studies of coastal livelihood system.

Dhaka University located in Bangladesh was the most productive institution which published eight documents of the studies related to the livelihood system in the coastal communities. Zhang et al. (2019), however, reported that Wageningen University located in Netherlands was the most productive organization which had published 71 papers regarding the global sustainable livelihood research. On the other hand, Duan et al. (2022) reported that James Cook University located in Australia was the most productive institution which had published 93 papers related to coastal and marine tourism research. Moreover, Syukron (2021) revealed that Charles Darwin University also located in Australia was the most productive institution which had published 26 papers regarding sustainable livelihoods of indigenous community. On the other hand, this study also revealed that Global Marine Team located in United Kingdom was the most influential institution on the studies of coastal livelihood system. This was strengthened by the fact that the authors coming from United Kingdom are the most influential authors on the studies of coastal livelihood system. This is line to Duan et al. (2022) revealing that the author who come from United Kingdom is the most influential author on the studies related to coastal and marine tourism.

Furthermore, Ocean and Costal Management was the most productive and influential source on the studies of coastal livelihood system. Nevertheless, Zhang et al. (2019) revealed that Sustainability was the most active journal which had published 57 documents related to the global sustainable livelihood research. On the other hand, Duan et al. (2022) reported that Journal of Coastal Research was

the most main source which had published 324 papers regarding the coastal and marine tourism studies. Meanwhile, Syukron (2021) reported that Forests Trees and Livelihoods was the most productive journal which had published 31 papers regarding the studies of sustainable livelihoods of indigenous community. Moreover, Syukron (2021) revealed that Human Ecology was the most influential journal in which the papers related to sustainable livelihoods of indigenous community published in the period of 1980 – 2021 had been cited as many as 914 times by other relevant papers. These reports show that there are the different sources between the most productive and influential source on the studies of coastal livelihood system and the most productive and influential source of other studies such as global sustainable livelihood research, marine and coastal tourism research, and sustainable livelihoods of indigenous community research.

The Social Interactions among Authors, Authors' Countries, and Authors' Institutions on the Studies of Coastal Livelihood System

Islam, M. M, an author affiliated in Leeds University, United Kingdom was connected to some authors in purple cluster such as Hubacek, K., Paavola, J., and Sallu, S in which they jointly worked a study related to fishery-based livelihoods (Md Monirul Islam et al., 2014). In addition, he was also connected to some authors in the yellow cluster such as Hossain, M. B., Islam, M. N., Islam, M. T., and Islam, R where they in common performed a research regarding nutrient composition of small indigenous fish species (R. Islam et al., 2020). Moreover, he was also connected to several authors in the green cluster such as Ahmed, T., Deb, D., Hossain, M. M., Mim, S. S., Mozumder, M. M. H., Pal, S., Schneider, P., and Uddin, M. M in which they together conducted a study related to coastal ecosystem services and social equity (Mohammad Mahmudul Islam et al., 2020). Additionally, Islam, M. M was connected to some authors in the blue-sky cluster such as Khan, M. S., Mondal, G., Khan, M. I., and Rahman, M. A in which they jointly studied a research regarding transformational adaptations to climatic hazards (Md Monirul Islam et al., 2021). This shows that apart from being the most productive author who has published five documents, Islam, M. M., is also the leading author who generates the networking researches regarding the coastal livelihood system.

The social interactions among authors' countries show that some countries such as United Kingdom, United States, Australia, India, and Bangladesh were the leading maker of the research networking that studied the livelihood system of the coastal communities. According to Zhang et al. (2019), a few of countries such as United Kingdom, India, Australia, and United States of America were the leading maker of research networking that studied the global sustainable livelihood. Moreover, Duan et al. (2022) revealed that five countries such as USA,

Spain, UK, Australia, and China were also the leading maker of the research networking that studied the marine and coastal tourism. Additionally, Syukron (2021) reported that four countries such as US, India, Canada, and Australia were also the leading maker of the research networking that studied the sustainable livelihoods of indigenous community. These reports prove that UK, US, Australia, India, and Bangladesh are the leading maker of the research networking that studies sustainable livelihood system of the coastal inhabitants.

The Forms of Livelihood System in the Coastal Communities

Co-word analysis showed that there were some emerging keywords related to the forms of the livelihood system of coastal inhabitants such as “shrimp aquaculture”, “agriculture”, “salinity”, “fisherman”, and “tourism”. This indicates that the people in coastal area have some livelihood systems. The development of beach tourism in the coastal zone is one of the alternative ways for the people to get the incomes. This is in line to some reports revealing that beach tourism is one of the promising businesses that coastal communities can generate and organize independently or jointly with the regional government (Arefipour et al., 2022; Ávila-Foucat et al., 2021; Hoefle, 2014; Lazzari et al., 2021). Additionally, they can provide various foods like sea foods for the tourists in which it interests them and also gives additional incomes for the coastal communities (Ávila-Foucat et al., 2021). Moreover, they also can supply some facilities for the visitors to play in the beach such as boat, surfing board, and diving equipment (Lazzari et al., 2021). In addition, the coastal communities can build a few of facilitations to stay around the beach such as hotel and lodge. Arefipour et al. (2022) also argued that some facilitations built by the coastal societies to stay around the beach can give the earnings for them. This shows that there are various sources of the beach tourism as one of livelihood systems of the coastal people.

Furthermore, to be a sailor or fisherman, the coastal people can fulfil their daily economic needs. This shows that fisherman is a livelihood system that the people can carry out in the coastal zone. Some studies also reported that sailor or fisherman is one of the main jobs of the communities who live in the coastal area (Huynh et al., 2021; Montes et al., 2019; Santha et al., 2014; Sharifuzzaman et al., 2018). This implies that the livelihood system is able to support the coastal inhabitants in sustaining their life by fulfilling their income needs. Then, several coastal people work as the farmer who manage fish, coconut, salt, and sago (Hossain et al., 2018; Kramer et al., 2017; Kriegl et al., 2022). This shows that apart from being the fisherman, the coastal communities can manage salt, sago, and coconut in which they are the important commodities to complete the people needs in

the daily life. Moreover, Kramer et al. (2017) explained that the need of salt to fill the nationally economic need requires the role of salt farmer in producing a lot of salts. In addition, Hossain et al. (2018) argued that the production of coconut from the coastal region mostly supplies the coconut need of urban dwellers. This presents that the job as fisher and farmer in the coastal zone is the forms of coastal livelihood system in which those livelihood systems give the profit for the coastal communities. The profitable livelihood system of coastal communities will soar coastal people's income in which it increases the standard of economic living representing the welfare of coastal people (Benessaiah & Sengupta, 2014; Jimenez et al., 2021; Wood et al., 2013).

Conclusion and Implication

Most of the people in the coastal zone work in the field of beach tourism because there are various sources of the beach tourism as one of livelihood systems of the coastal people. As a consequence, the development of beach tourism in the coastal zone can be one of the alternative ways for the coastal communities to get the incomes. Additionally, fisherman is another livelihood system that the people can carry out in the coastal zone because it is able to support the coastal inhabitants in sustaining their life by fulfilling their income needs. Moreover, some coastal inhabitants work as the farmer who manage fish, coconut, salt, and sago because these items are the important commodities to complete the people needs in the daily life. Thus, the profitable livelihood system of coastal communities will increase coastal people's income in which it increases the standard of economic living representing the welfare of coastal people.

This study implies that the people in the coastal zone can choose some of livelihood systems such as tourism, fisher, and farmer to meet the economic needs in the daily life. It indicates that the variety of coastal livelihood systems can sustain the livelihood development of communities in the coastal zone. The sustainable livelihood system is an important factor that has to be noticed by the government to guarantee the sustainable welfare of the people mainly in the coastal area. As a consequence, the government must make the policy supporting the sustainable livelihood system of the coastal communities. The opening of road access from the central city to the destination of beach tourism is the main action that the government has to conduct. Then, the construction of a few of facilitations for the tourists to stay around the beach such as hotel and lodge must be supported by the government. Additionally, the government also have to provide some sophisticate facilities such as boat and catching tool for the fishers to catch marine biotas such as fish, crab, shrimp, and squid. Moreover, the government must ensure that the products

produced by the fishers or farmers such as salt, sago, fish, and other marine biotas can be distributed and sold in the market providing the profitable incomes for them.

Limitation and Suggestion

This study only involves the Scopus as the scientific database to search the documents related to the coastal livelihood system. Even though the Scopus is one of the scientific databases which have the large well-qualified documents, but these documents have not represented the certain field regarding the people's livelihood system in the coastal zone. Therefore, this study suggests to involve other scientific databases which also have numerous well-qualified documents such as Web of Science and MDPI. In addition, this study only uses co-word analysis to map the forms of inhabitants' livelihood system in the coastal area. Meanwhile, there are other analyses such as co-citation analysis and bibliographic coupling that can enrich findings of the forms of people's livelihood system in the coastal area. As a consequence, the involvement of some analyses such as co-citation analysis and bibliographic coupling is needed to enrich co-word analysis.

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