



LITERATURE REVIEW

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Evolutionary Study of Three Decades Literatures Related to Disaster Management Agency and Public Policy: A Bibliometric Study

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Abstract

This study is aimed at examining scientific literatures written by international authors focusing on disaster management agency topic that are related to public policy from the first paper published in 1995 to 2022 using bibliometric study employing a database from Scopus. To visualize the results, this study utilizes VOSviewer version 1.6.17. The results showed that this topic emerged in Thailand which focused on roles of local level disaster management agency in carrying out rehabilitation and reconstruction activities in district level. However, Federal Emergency Management Agency, or the United States Disaster Management Agency, was considered to be the most researched disaster management agency. Besides, open-access social science articles dominated the type of publications in this research area. Moreover, the United States and its authors were perceived as the most productive and influential country and authors. Meanwhile, the United Kingdom was recognized as the most influential sources title with Journal "Disasters" served the most productive and influential source title. Besides, the affiliation among Austria, Nigeria, South Africa, and the United States were acknowledged as the most productive and influential affiliations. The analysis also indicated that this topic developed and strongly connected to disaster and disaster management research areas. Considering the comprehensive nature of bibliometric analysis, this study may help scholars get a broad view of the relevant issues, while at the same time identifying reputable publications worth studying for reference.

Keywords: bibliometric study; disaster management; public policy; VOSviewer.

Introduction

The significant increase of global losses caused by natural hazards by more than 800% in the last 40 years shows clear evidence that the alarming frequency, severity, complexity, and magnitude of calamities in highly susceptible communities have had vast and eternal effects on people, poverty, and the achievement of global sustainability (World Bank, 2022). Consequently, policy-makers are mostly faced with the consequences and need to respond to the phenomena accordingly. They are required to formulate disaster policies to establish the legal basis for all aspects and phases of disaster management and to support more equitable, integrated, and inclusive approaches to building resilience (IFRC, 2018). Moreover, a policy is an important element in state law to provide legality and legitimacy for government actions (Sadiawati et al., 2019). Consequently, failure to create a good disaster policy will be counterproductive and results in less performance of state administration.

On the other hand, although many countries have commenced initiatives and fabricated enormous progress to develop their capabilities in managing disasters, taking into account institutional challenges in policy reform to cope with increasing threats that disasters create continues to be a key challenge (Bae et al., 2016). Research has even indicated that disaster policies frequently do not include the specificity or clarify roles, responsibilities, and coordination mechanisms for disaster management agencies and actors from national to local level (IFRC, 2018).

Currently, several developing and developed countries undergo disaster management, both in a decentralized and centralized governance context. However, the recurring debates on the advantages and disadvantages of



those two approaches and the significant roles of central as well as local level disaster management agencies have led to curiosity about how scholars view issues related to disaster management agency as well as public policies governing the issue and reflect them in their scientific publications. Consequently, a comprehensive review of the relevant studies becomes essential. In this case, evolutionary studies of the field will enable scholars as well as researchers to examine and investigate such type of study (Hou et al., 2021).

Meanwhile, research on disaster management has been widely expanding from time to time and thus encouraged scholars to carry out studies on disaster management and its related issues using bibliometric studies. This is because bibliometric studies allow researchers to portray and visualize a large amount of scientific data in a specific field which will enable researchers to reveal evolutionary variation and investigate the emerging issues in the concerned area (Donthu et al., 2021). Those disaster management-related bibliometric studies, among others, focus on the use of big data to manage disasters (Akter & Fosso Wamba, 2017), disaster management policy in China (Zhang et al., 2018), the urgency of simulation to better prepare for natural hazards (Barnes et al., 2019), the use of emerging technology in disaster management (Du et al., 2017)(Vermiglio et al., 2022), community resilience (Demiroz & Haase, 2019)(Q. Yang et al., 2021), epidemics (Liu et al., 2021), the relationship of law and disaster management (Gurpur et al., 2021), as well as decision making in an emergency situation (Hou et al., 2021).

Besides, although disaster management has witnessed rapid development and there have been a large number of publications in the past decades, there are only a few studies emphasizing disaster management agency and policy so far. For example, Husna et al. (2022) elaborate on the preparedness of disaster mitigation agencies and the policies they implement in high-vulnerability zones in Aceh, Indonesia using a cross-sectional study. Clark-Ginsberg et al. (2021) emphasize how inequalities in disaster management agency function and policy may result in creating disaster risks for vulnerable and marginalized people. Meanwhile, Grove (2014) critically analyzes the participatory disaster resilience program and policy in Jamaica.

All those publications have provided valuable insights and research agendas worthy of academic attention. However, none of the above disaster management-related bibliometric studies focuses on disaster management agency and public policy. Moreover, the studies carried out by Grove (2014), Clark-Ginsberg et al. (2021), and Husna et al. (2022) also lack a bibliometric analysis. Thus it is interesting to navigate the study development of the area of disaster management agency and public policy using bibliometric study since the field remains unexplored. Therefore, the purpose of this article is to review disaster management agency and public policy literature with the help of bibliometric analyses in a systematic way.

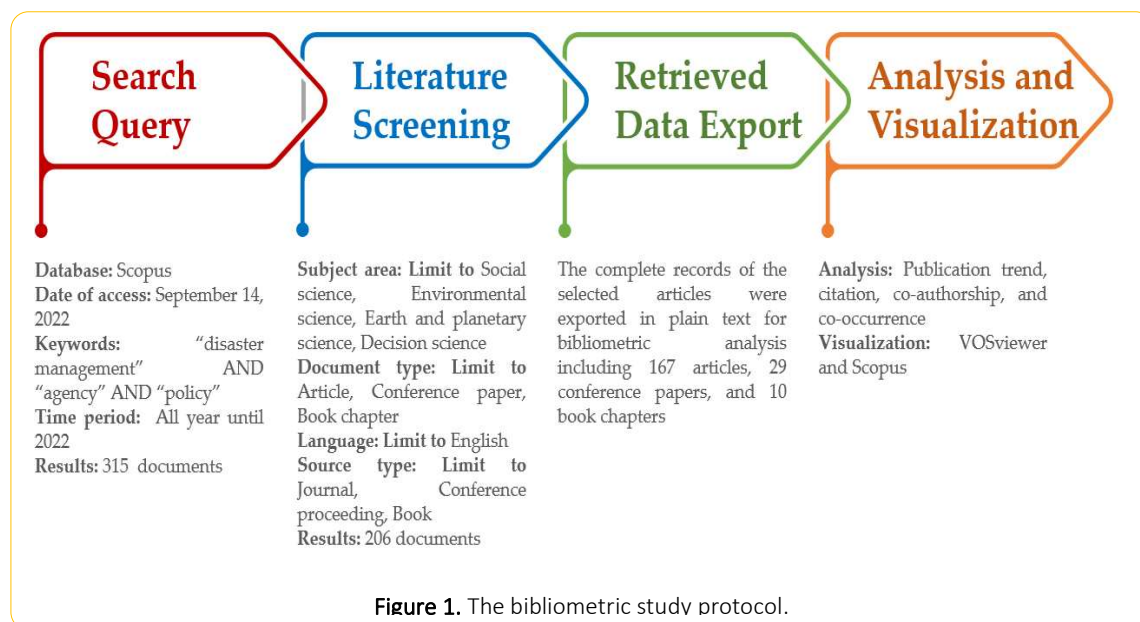
Methods

The bibliometric study deals with incorporating different structures, methods, and tools to learn and investigate a huge amount of scientific data while at the same time generating high-impact research (Ponce & Lozano, 2010)(Donthu et al., 2021). Bibliometric allows researchers to scrutinize trends in the retrieved data based on specific keywords the researchers utilize as well as visualize the emerging trends and knowledge distribution from various detail (Barnes et al., 2019)(Q. Yang et al., 2021). Therefore, bibliometric studies may deliver a one-stop overview, identify unfilled space in certain research areas, acquire research novelty, and place a study in a certain area of research (Donthu et al., 2021). Besides, a bibliometric study on literature related to the policy will enable researchers to uncover policy fundamental shifts and trajectories (Zhang et al., 2018).

Chen & Xiao (2016) state that in a bibliometric research, when the research is aimed at revealing the details of a domain's major research topics and their relations at the micro-level, the selection of a few keywords to represent important research themes in the domain is necessary. Consequently, since this research is intended to reveal discourses on disaster management agency and public policy, three important keywords are selected, i.e. "disaster management", "agency", and "policy". Although considered as being a popular keyword, "disaster

management” was chosen as the first keyword since this kind of general keyword will be useful to provide a rough overview of a scientific discipline (Chen & Xiao, 2016). Further, we add two keywords “agency” and “policy” to explore how international publications reflect the relations between agencies operating in disaster management and policies related to the issue. In this case, we use disaster management terminology developed by the United Nations Office for Disaster Risk Reduction, i.e. the organization, planning, and application of measures to prepare, respond to, and recover from disasters (UNDRR, 2015). Further, agency refers to a government agency, both at the central and local levels, that is responsible for the management of disasters, including preventing disasters, mitigating disasters, recovering the impact of disasters, and rebuilding the society of an occurred disaster (J. Yang et al., 2009). Meanwhile, policy is simply defined as an answer to public issues (Cooper in Islamy, 2017).

This bibliometric study is carried out with a certain protocol that is intended to conduct science mapping. The protocol comprises search query, literature screening, retrieved data export, as well as literature analysis and visualization. Literature search and screening in addition to retrieved data export were carried out on September 14, 2022. The Boolean operator search operation used is (TITLE-ABS-KEY (“disaster management”) AND TITLE-ABS-KEY (“agency”) AND TITLE-ABS-KEY (“policy”)) AND (LIMIT-TO (SUBJAREA, “SOCI”) OR LIMIT-TO (SUBJAREA, “ENVI”) OR LIMIT-TO (SUBJAREA, “EART”) OR LIMIT-TO (SUBJAREA, “DECI”)) AND (LIMIT-TO (DOCTYPE, “ar”) OR LIMIT-TO (DOCTYPE, “cp”) OR LIMIT-TO (DOCTYPE, “ch”)) AND (LIMIT-TO (LANGUAGE, “English”)) AND (LIMIT-TO (SRCTYPE, “j”) OR LIMIT-TO (SRCTYPE, “p”) OR LIMIT-TO (SRCTYPE, “b”)). Furthermore, VOSviewer software version 1.6.17 and Scopus were applied to analyze and visualize the result. The research protocol is illustrated in Figure 1.



When carrying out this bibliometric study, we extract a literature search from Scopus since it comprises the most extensive structured set of data of citations and abstracts from peer-reviewed scientific and written literature, including articles from reputable scientific journals, book reviews, and conference proceedings (López-Muñoz et al., 2018). Scopus also covers a broad range of fields, such as social science, environmental science, medicine, business, management, accounting, energy, and so on. As seen in Figure 1, the search query was carried out using the keywords “disaster management”, “agency”, and “policy” in the title, abstract, and keywords fields of the database. We used all year period until 2022 to select data since this was valuable to reveal the very first and latest publications. To this step, we got 315 documents. Then, we refined the literature screening by limiting the subject areas into social science, environmental science, earth and planetary science, and decision science. The

document types were also refined to only articles, conference papers, and book chapters. Only those three types of documents published in journals, conference proceedings, and books using English were considered in the analysis. To ensure the relevance of the documents to the analysis, a manual screening that took into account titles and abstracts was carried out. This further screening resulted in 206 documents. Then, we chose VOSviewer to help visualize and analyze the retrieved data since to date VOSviewer had been extensively utilized for the bibliometric study of several areas of research (van Eck & Waltman, 2010)(Hou et al., 2021). To comprehend the inquiry and visualization, metrics from Scopus were also employed.

Results

General overview

Open-access indicates that peer-reviewed journals and articles are online and available without restriction. The search result shows that out of 206 documents, only 131 publications that include relevant article titles, abstracts, and keywords are open-access. Among those open-access publications, 57 documents are all open-access, 34 documents belong to the “green” category (approved to be published or have been published and can be found in the repository), 18 documents belong to the “gold” category (ready in only open-access journals), 14 documents belong to “bronze” category (issued version of written documents which are accepted for publication), and the rest eight documents belong to “hybrid gold” category (available in journals that offer authors option of publishing open access) as seen in Figure 2.

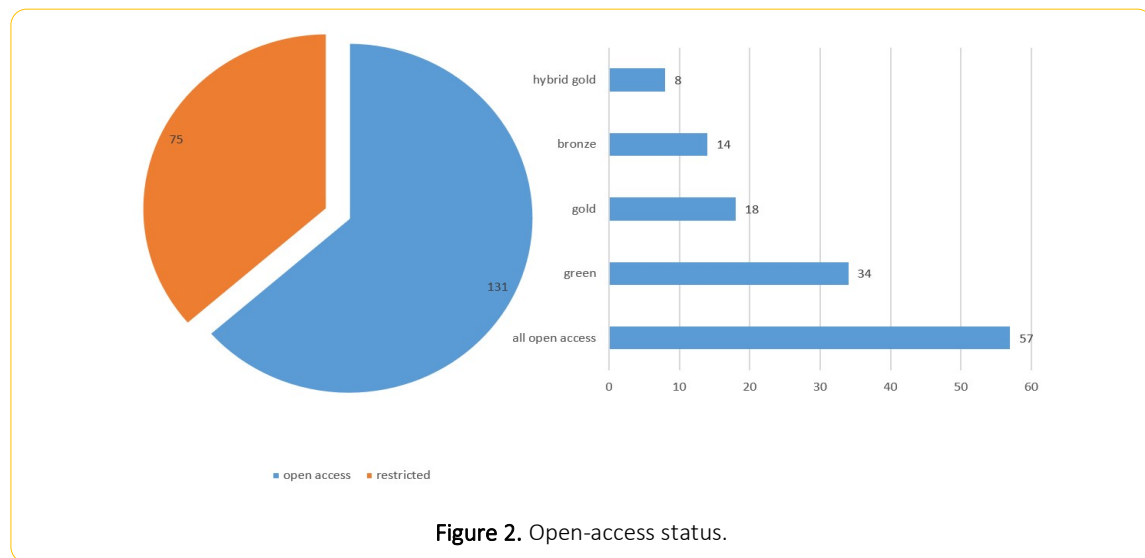


Figure 2. Open-access status.

Further, although concern related to disaster and disaster management studies grows rapidly, not much research can be found in the field of disaster management agency and public policy from Scopus. We figured out that “disaster management” was a popular or general keyword and had become one of the most researched themes in international journals. We found 23,733 publications applying “disaster management” as a keyword in the Scopus database. This number decreased to 1,957 publications when the keyword “agency” was added. Finally, when the last keyword “policy” was joined, there were only 315 publications. Furthermore, the analysis of the publications shows that the research in the field of disaster management agency and public policy was initiated in 1995 through an article entitled “Rehabilitation planning for flood-affected areas of Thailand: Experience from Phipun District”. This article was published in *Disasters*, Volume 19, Number 4, pages 348 – 355, and focused on a disaster management agency’s tasks at a very small area (i.e. district level) and its challenges that wrecked the rehabilitation activities in disaster-affected areas. However, this topic seems to have failed to attract researchers’ attention to this field since the second publication indexed by Scopus was just released three years later which

examined South Africa's disaster management policy and coordination among several government agencies in disaster management.

Subsequently, during 1998-2003, researchers started to discuss the topic widely causing the average annual publication raised to five documents per year. Nevertheless, during 2004-2007, the number of publications again experienced a drastic decline when there were only one to three publications annually. The re-invention concern in this research area was in 2008 when Pat Reid and Dewald van Niekerk introduced South Africa's multi-agency response system model to the world. Later, the publication trend in the field began to escalate. The number of publications during 2008-2022 also fluctuated. The highest number of publications was in 2021 when there were 27 publications made as illustrated in Figure 3.

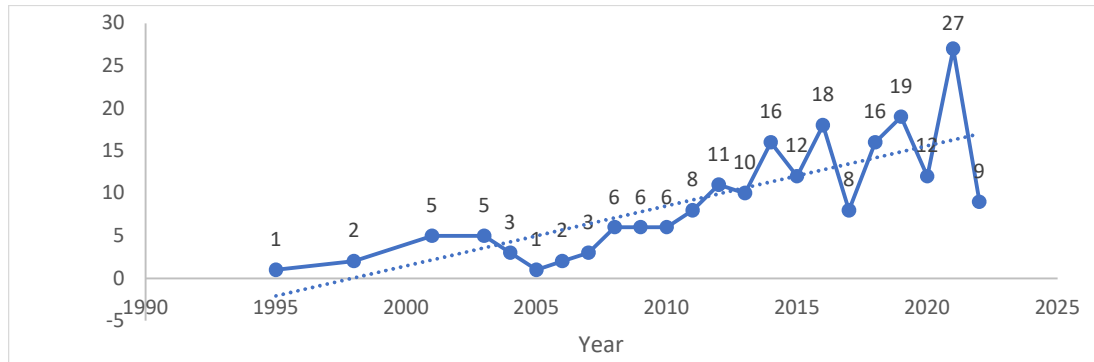


Figure 3. Numbers of publications including discourse related to disaster management agency and public policy during 1995 – 2022.

The publication on the field of disaster management agency and public policy in Scopus is also diverse. Articles dominate this research area (81.1%) followed by conference papers (14.1%) and book chapters (4.9%). Those documents are published in various publications, including journals (167 documents), conference proceedings (29 documents), and books (10 documents) as seen in Table 1.

Table 1. Types of publications on disaster management agency and public policy study.

Types of Documents	Year				Total
	1995 - 2001	2002 - 2008	2009 - 2015	2016 - 2022	
Articles	6	18	59	84	167
Conference proceeding	2	0	8	19	29
Book	0	2	2	6	10
Total	8	20	69	109	206

Moreover, since disaster management research areas are borderless, there are numerous subject areas comprising disaster management agency and public policy-related issues. However, social sciences dominate the discussion (33.7%), followed by environmental science (19.6%), earth and planetary science (18.1%), engineering (7.4%), as well as business, management, and accounting (2.9%) as illustrated in Figure 4.

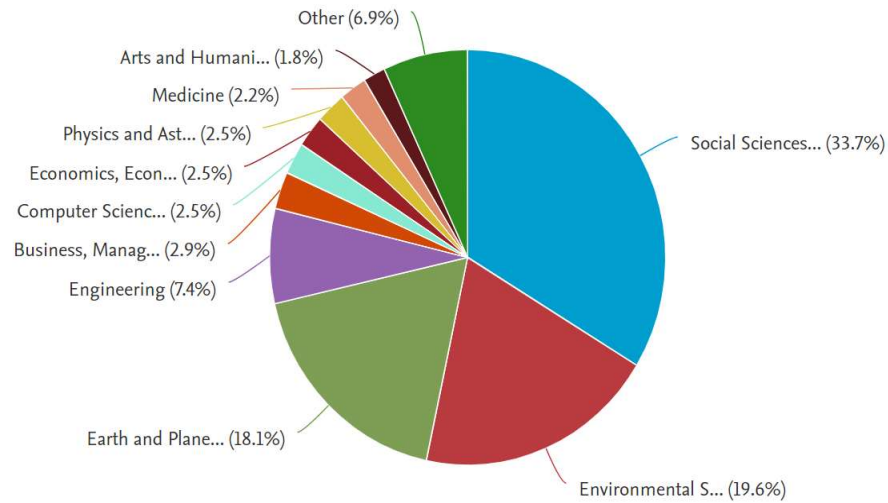


Figure 4. Articles publication based on subject area.

Citation analysis

This type of analysis presumes that citations portray a conceptual relationship between publications when there is a citation from another or other publications (Appio et al., 2014). Hence, a publication is considered influential by the total of citations it gets. Meanwhile, the quality of the paper is derived from the number of citations divided by the number of publications.

Gradually, research areas on disaster management agency and public policy have come to countries around the globe's attention. 51 countries are spread over various continents publishing 203 documents on the issue during 1995-2022. In this analysis, the other three documents cannot be specified in terms of their origin. The United States gets the first rank for the number of citations and publications and leaves other countries behind. Consequently, the United States is considered the most influential and productive country in this research area. However, South Africa gets the first rank in the quality of paper (see Figure 5).

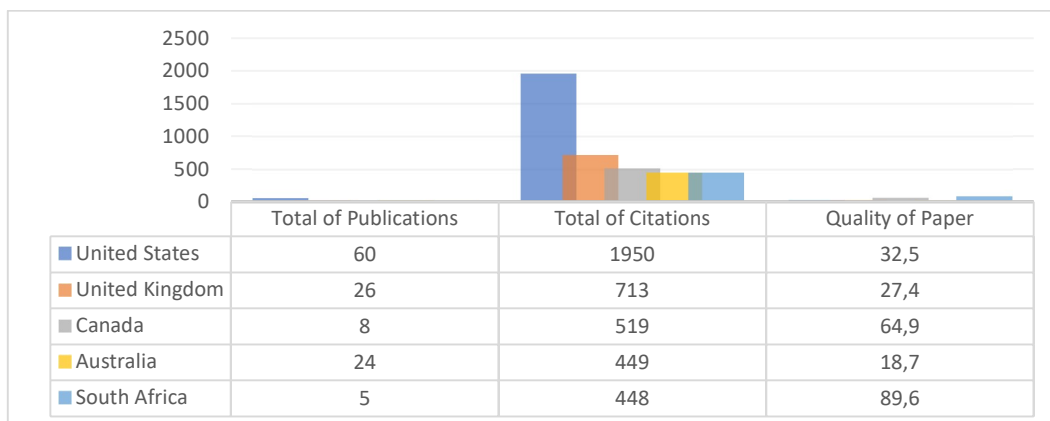
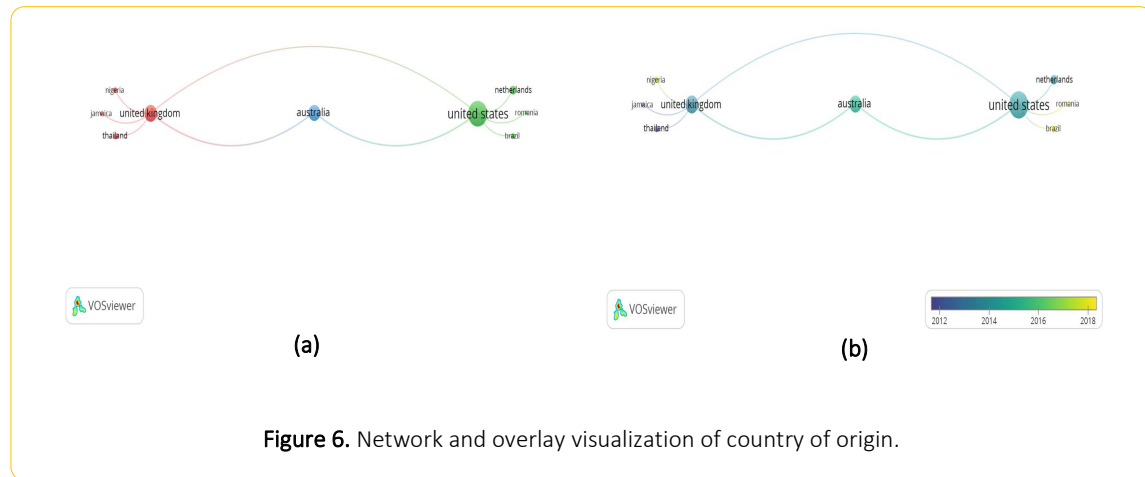


Figure 5. Top five most influential countries in disaster management agency and public policy research areas.

Studies carried out by countries around the globe also connected and create a network. The citation network analysis resulted by VOSviewer shows that there are three clusters of the country of origin. The first cluster

consists of the United Kingdom, Nigeria, Jamaica, and Thailand where the United Kingdom dominates the cluster. This cluster connects to the second cluster which comprises the United States, Brazil, Netherlands, and Romania where the United States leads the cluster. Moreover, the third cluster exists and only consists of Australia. Overall, the United States dominates all those three clusters. This is relevant to the discussion on the most productive and influential country of origin seen in Figure 5. Besides, the citation overlay visualization also revealed that research areas on disaster management agency and public policy emerged from Thailand and then spread to the United Kingdom, the United States, the Netherlands, and Australia. Meanwhile, this field of study is relatively a new discussion for Nigeria, Brazil, and Romania as seen in Figure 6.



Meanwhile, in terms of source titles, the research area of disaster management agency and public policy is involved in 121 source titles comprising journals, conference papers, and books. Disasters from the United Kingdom has taken the first place in the number of publications (16 documents) and citations (522 citations), and thus, is considered to be the most productive and influential source title in this research area. Whilst, World Development ranks first for quality of paper (188) as seen in Table 2. An interesting phenomenon is found where the top five source titles are journals and they are all from the United Kingdom, even though the United Kingdom only serves as the second country for the total of publications and citations far behind the United States (referring to Figure 5 above).

Table 2. Top five most influential source titles in disaster management agency and public policy research areas.

Source Title	Source Type	Country of Origin	Scopus Quartile	Cite Score (2021)	SJR (2021)	SNIP (2021)	Total of Publication	Total of Citation	Quality of Paper
Disasters	Journal	United Kingdom	Q1	5.3	0.815	1.633	16	522	32.6
Global Environmental change	Journal	United Kingdom	Q1	15.7	3.154	3.08	4	404	101
Climate Policy	Journal	United Kingdom	Q1	9.8	1.654	1.648	2	359	179.5

Journal of International Development	Journal	United Kingdom	Q2	3.1	0.604	1.494	2	270	135
World Development	Journal	United Kingdom	Q1	9.4	2.297	3.031	1	188	188

In addition, the analysis also reveals that there are 581 authors, both working individually or in a team, who have published their documents related to disaster management agency and public policy discourse during 1995–2022. Those authors produce one to three documents during that period. Among those authors, there are 105 authors whose publications have not been cited by another publication. Coleen Vogel's publications are considered to be the most influential publications in this research area since they are cited most frequently (see Table 3). Moreover, although producing the most publication (three documents), Laurie A. Johnson gets fewer citations (58) and thus does not belong to the top ten of the most influential authors. Additionally, the United States authors also dominate the field.

Table 3. Top ten most influential authors based on publication citation in disaster management agency and public policy research areas.

Rank	Name of Author	Institution	Total of Publications	Total of Citations	Quality of Paper
1st	Vogel, Coleen	Global Change Institute	2	385	192,5
	Dabelko, Geoffrey D.	Ohio University	1	383	383
2nd	Kasperson, Roger E.	Clark University	1	383	383
	Moser, Susanne C.	University of Massachusetts	1	383	383
3rd	Mirza, M. Monirul Qader	University of Toronto	2	359	179,5
4th	Hartmann, Betsy	Hampshire College	1	257	257
5th	Skoufias, Emmanuel	The World Bank Group	1	188	188
6th	Ritchie, Brent W.	The University of Queensland Business School	1	179	179
	Lindell, Michael K.	University of Washington	1	157	157
7th	Prater, Carla S.	Environmental Hazards Research Institute	1	157	157
	Zhang, Yang	Virginia Polytechnic Institute and State University	1	157	157

8th	Twigg, John	University College London	2	109	54,5
9th	Gove, Kevin J.	Florida International University	1	104	104
10th	Fainstein, Susan S.	Harvard University	1	100	100

In terms of document citation, the top five documents cited are articles published in various journals. The catch-the-eye issue regarding the document citation can be seen in the year of publication. In this case, the top five articles were all written during 2003–2010 as seen in Table 4. Moreover, within the top ten cited articles, there were only two articles published in the last ten years, entitled “Agency, affect, and the immunological politics of disaster resilience” (Grove, 2014) with 104 citations and “Resilience and Justice” (Fainstein, 2015) with 100 citations. This indicates that the research area develops slowly, and thus, scholars tend to cite old publications more than the latest ones.

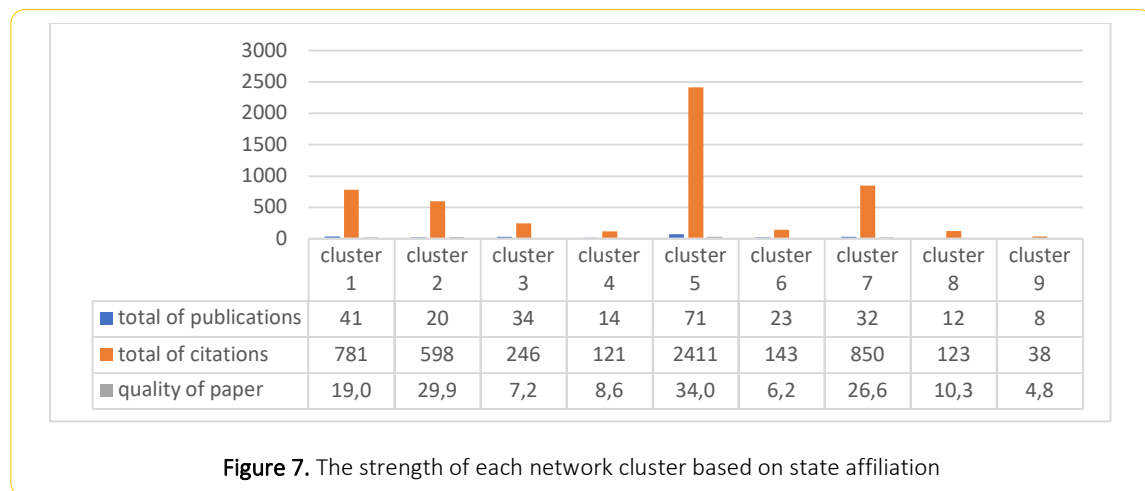
Table 4. Top five citations on articles on the research areas

Title of Articles	Authors	Year of Publication	Citation	Source Title
Linking vulnerability, adaptation, and resilience science to practice: Pathways, players, and partnerships	Vogel, et al.	2007	383	Global Environmental Change
Climate change and extreme weather events: Can developing countries adapt?	Mirza, MMQ	2003	310	Climate Change
Rethinking climate refugees and climate conflict: Rhetoric, reality and the politics of policy discourse	Hartmann, B	2010	257	Journal of International Development
Economic crises and natural disasters: Coping strategies and policy implications	Skoufias, E	2003	188	World Development
Tourism Disaster Planning and Management: From Response and Recovery to Reduction and Readiness	Ritchie, B	2008	179	Current Issues in Tourism

Co-authorship analysis

Initially, scientific work is individual work. However, as the increasing of the complexity of the research topic, research area, and methodology as well as the rapid development of theory and science, collaboration or affiliation among academics becomes more and more popular, especially when preparing a joint paper, which is known as co-authorship (Acedo et al., 2006). And thus, this type of analysis reveals interaction among researchers in a certain research area (Donthu et al., 2021).

In terms of country of origin, the bibliometric analysis of co-authorship shows that there are nine clusters of countries of origin. Cluster 1 consists of eight countries comprising Australia, Finland, New Zealand, Romania, Solomon Islands, Switzerland, Thailand, and Vanuatu. Cluster 2 consists of six countries comprising Canada, Denmark, Iraq, Italy, Phil, and Samoa. Cluster 3 consists of five countries comprising Japan, Malaysia, Myanmar, the Philippines, and South Korea. Cluster 4 consists of four countries comprising Colombia, France, Greece, and the Netherlands. Cluster 5 consists of four countries comprising Austria, Nigeria, South Africa, and the United States. Cluster 6 consists of four countries comprising Brazil, Germany, Indonesia, and Tanzania. Cluster 7 consists of four countries comprising Bangladesh, Saudi Arabia, Trinidad and Tobago, as well as the United Kingdom. Cluster 8 consists of three countries comprising Ethiopia, India, and United Arab Emirates. Meanwhile, cluster 9 consists of three countries comprising China, Oman, and Pakistan. In terms of productivity and citation, cluster 5 is considered the most productive and influential affiliation. Cluster 5 affiliation also has the highest quality of the paper. The strength of each country cluster is seen in Figure 7.



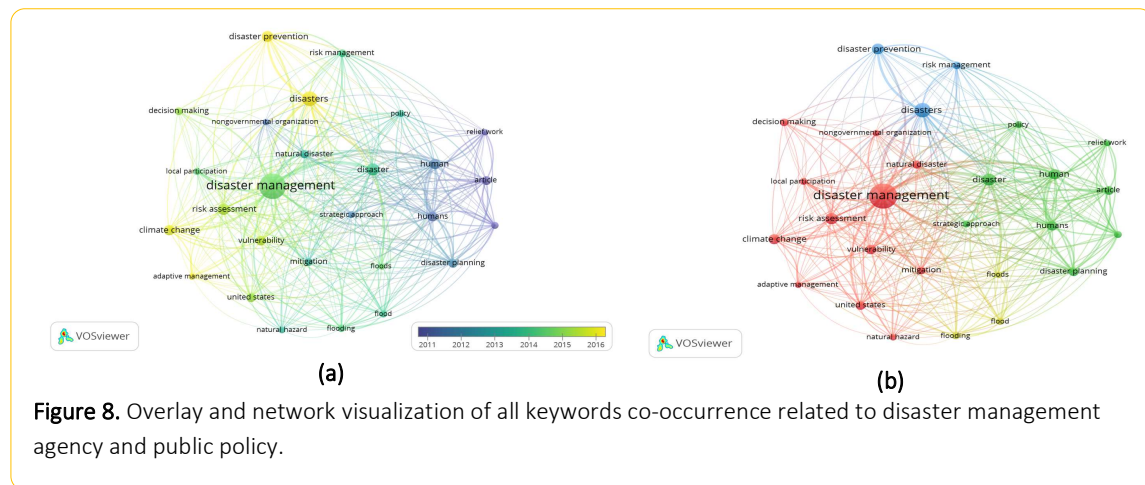
Moreover, the bibliometric analysis also shows that 451 institutions are affiliating in the research areas of disaster management agency and public policy where each of the affiliations only produces one document related to this field. George Perkins Marsh Institute of Clark University (383 citations); Institute for the Study, Society and Environment of National Center for Atmospheric Research (383 citations); School of Geography, Archaeology and Environmental Studies University of the Witwatersrand (383 citations); Woodrow Wilson International Center for Scholars (383 citations); as well as the Institute for Environmental Studies (310 citations) are considered to be the top five most influential affiliation in term of organization.

Co-occurrence analysis

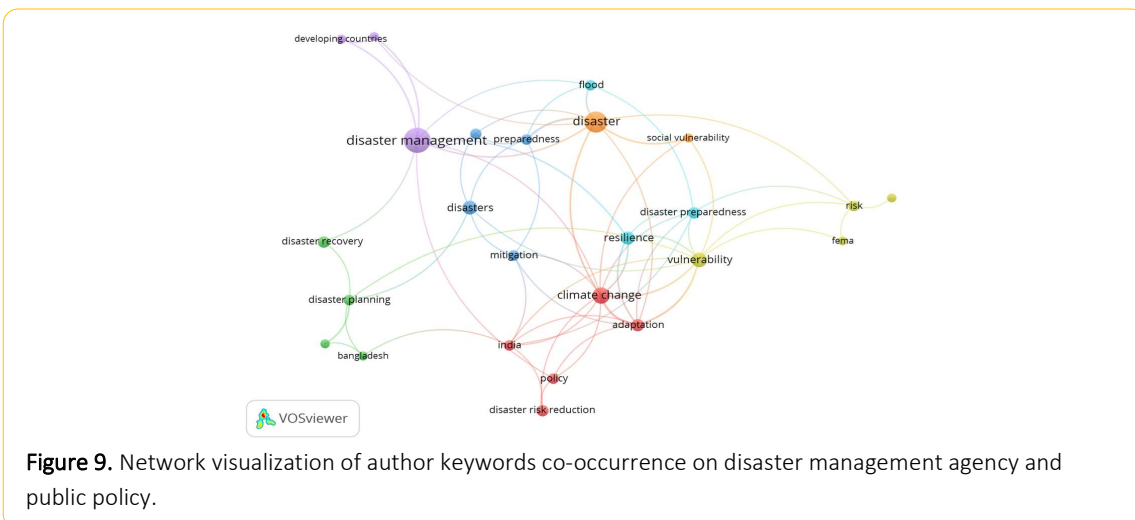
Scholars carry out keyword co-occurrence analysis to disclose underlying research communities of a certain field of the research area and the potential relationship between those fields (Emich et al., 2020). Meanwhile, Zou et al. (2018) state that keywords convey the central idea of an academic publication. Further, Pesta et al. (2018) add that keywords are considered to be the most significant terms in an academic publication. Therefore, co-occurrence analysis can help scholars investigate the content of a document (Donthu et al., 2021).

There are all 1,486 keywords from 206 publications related to disaster management agency and public policy. The VOSviewer co-occurrence analysis is carried out using the full counting method, all keywords, and the lowest limit of occurrences of a keyword is 10 times. The analysis shows that there are four clusters with 27 nodes (see Figure 8). Cluster 1 (red) includes 12 items and focuses on the keywords “disaster management (152 occurrences) and risk assessment (33 occurrences)”. Cluster 2 (green) consists of nine items and focuses on the keywords “disaster

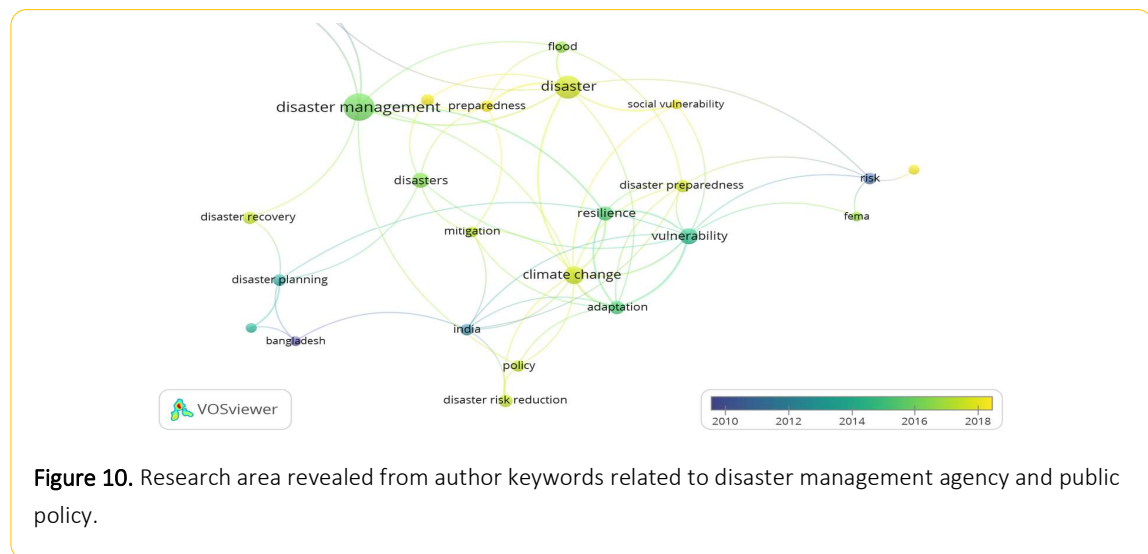
(34 occurrences) and human (26 occurrences)". Cluster 3 (blue) consists of three items and focuses on the keywords "disasters (50 occurrences) and disaster prevention (30 occurrences)". Cluster 4 (yellow) consists of three items and focuses on the keyword "flood" (13 occurrences). Moreover, the keywords "disaster management" and "disasters" dominate all keywords. Meanwhile, keywords related to "policy" and "organization and management" belong to cluster 2. Further, the overlay visualization reveals that the keywords "organization and management", "relief work", "article", and "human" have been employed since early 2011. Whilst keywords "policy", "local participation", "mitigation", and "risk management" emerged after 2013. On the contrary, the keywords "disaster prevention", "climate change", and "adaptive management" emerged after 2016.



In terms of author keywords, there are 640 keywords employed by authors in 206 publications related to disaster management agency and public policy. The analysis employs a full counting method, author keywords, and the lowest limit of occurrences of a keyword is four times. The analysis shows that there are seven clusters with 25 nodes (see Figure 9). Cluster 1 (red) encompasses five items and focuses on the keyword "climate change" (12 occurrences). Cluster 2 (green) involves four items and focuses on the keyword "disaster recovery" (6 occurrences). Cluster 3 (dark blue) includes four items and focuses on the keyword "disasters" (9 occurrences). Cluster 4 (yellow) consists of four items and focuses on the keyword "vulnerability" (10 occurrences). Cluster 5 (purple) covers three items and focuses on the keyword "disaster management (28 occurrences). Cluster 6 (light blue) consists of three items and focuses on the keyword "resilience" (8 occurrences). Last, cluster 7 (orange) consists of two items and focuses on the keyword "disaster" (19 occurrences).



Meanwhile, from the author's keywords, it can be seen that the evolution and trajectory of discussion in the field of disaster management agency and public policy take place during 2010–2018 and are divided into six phases. Before 2010, the authors' keywords represented area study of "bangladesh" and "developing countries". During 2010–2012, the authors' keywords focus on "india" and "risk". Further, during 2012–2014, the authors' keywords emphasize "disaster response" and "disaster planning". Meanwhile, during 2014–2016, the authors' keywords provide concern on "vulnerability", "adaptation", "resilience" as well as "disaster management". Then, during 2016–2018, the authors' keywords focus on "mitigation", "fema", "disaster risk reduction", and "disaster preparedness", in addition to "policy". Furthermore, from 2018 onwards, the authors' keywords focus on "emergency management", "social vulnerability", and "preparedness" as seen in Figure 10. Moreover, the United States' disaster management agency or known as Federal Emergency Management Agency (FEMA) has been included in several authors' publications and indicates that its existence is widely recognized and thus attracts scholars' concerns to investigate its roles and policy in disaster management.



Conclusions

Academics' concern for the disaster management agency and public policy is reflected in the indexed Scopus database during 1995–2022. Hence, this bibliometric study has revealed several captivating phenomena. First, initiated in Thailand in 1995, discourse on the topic stumbled in its development. A growing concern on the issue then re-emerged in 2008 and continuously developed so far. Second, although dominated by social sciences, this topic was widely discussed and thus covered diverse subject areas. Third, albeit the United States' first rank in productivity and influence in this research area, South Africa ranked first for the quality of the paper. Fourth, notwithstanding that the United States authors were the most influential and productive ones, the United Kingdom's journals defeated the United States in terms of source titles. Fifth, citations from old publications still dominate the citations of the articles. Sixth, the affiliation of the United States, Austria, Nigeria, and South Africa results in the most influential and productive publications as well as the highest quality of the paper. Seventh, although several publications have discussed disaster management agencies, FEMA was the only disaster management agency mentioned in the keywords. Last, the development and evolution of keywords related to this research area are also relevant to the shifting concern and paradigm of disaster management.

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