Geographic Skew in Disaster Research based on Bibliometric Analysis and Information Visualization of a High-Impact Journal

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Abstract: The study aims to determine whether there is a skew in disaster research, with most disasters occurring in developing nations, while most research on disasters takes place in developed nations. The method adopted to determine this was to analyze the citation patterns and identify influential authors, institutions, and countries in disaster research. Additionally, the relationship between citations and publication age, keyword clustering, cited sources and cited authors was visualized using the graphical mapping tool VOS Viewer. The findings demonstrate that authors contributing significantly to the field of disaster management are primarily affiliated with developed nations, while the disaster-prone areas are predominantly located in developing nations. This divide poses a substantial barrier to comprehending disaster geographies and allocating relief resources effectively. Although some studies have investigated collaboration patterns and research trajectories in disaster management, few have examined the unequal geographic distribution of disasters and the corresponding authorship. In conclusion, this study underscores the importance of addressing the geographic distribution of disasters and the authors reporting on them. Encouraging diverse and inclusive research collaborations can help mitigate this issue and enhance global disaster management strategies, promoting diversity, equity, and inclusion for underrepresented regions like the African continent. This bibliometric analysis investigates 1876 papers published in the International Journal of Disaster Risk Reduction, the most influential amongst the disaster management journals, between 2012 and 2020, sourced from the Scopus database.
Keywords: Scientometric analysis, African research, Disaster Risk Reduction, Diversity–Equity–Inclusion, Disaster Geography, VOS Viewer, Skewness in research, IJDRR.

Introduction

Scholarly journals play a pivotal role in facilitating scientific discourse, serving as the fundamental conduit for knowledge dissemination. Therefore, it becomes imperative for editorial boards and the scholarly reader community to engage in systematic and meticulous monitoring and evaluation of these journals, employing bibliometric methodologies. Such endeavors enable the growth and development of the journal and its authors in a mutually advantageous and academically rigorous manner. The exponential expansion of academic publishing and research output in print form has been acknowledged since the 1960s, as observed by De Solla Price (1963). In recent times, the application of bibliometric methodologies has gained substantial traction in the assessment of the scientific impact of journals. These methods have proven invaluable in identifying highly productive authors and esteemed research institutions, discerning emerging areas and trending topics, highlighting influential papers with significant citations, unveiling patterns of scientific collaboration, and exploring interdisciplinary models (Laengle et al., 2018). The application of bibliometric methodologies in investigating the knowledge framework and scientific attributes of journals has demonstrated substantial utility for authors and the advancement of scientific discourse within the respective journal (Xu et al., 2018). Nevertheless, recent findings stemming from bibliometric investigations, specifically within the domain of Disaster Management (DM), have unveiled a disparity between the geographical origins of DM research and the locations where the majority of disasters transpire. This incongruity bears significant implications for the efficacy of disaster relief endeavors, as research emanating primarily from developed nations may prove inadequate in meeting the exigencies of developing nations characterized by higher vulnerability to disasters. Consequently, it becomes imperative to bridge this research gap and foster more comprehensive and inclusive collaborations within the realm of Disaster Management (DM), thereby enhancing global strategies for disaster management.

The investigation pertaining to the incongruity between locations of Disaster Management (DM) research and disaster occurrences was further advanced through a meticulous examination of the International Journal of Disaster Risk Reduction (IJDRR). Esteemed as a prestigious platform, the IJDRR serves as a vital avenue for researchers, policymakers, and practitioners to disseminate their scholarly contributions, with the overarching objective of enhancing disaster risk analysis, management, and governance capacities at national, regional, and international scales. Encompassing an array of high quality research articles, the journal encompasses theoretical and methodological aspects of disaster science, emergency response technology, disaster risk management, and comprehensive large-scale disaster risk governance. This scholarly repository encompasses a diverse range of content, including insightful case studies, research comparing responses to

major disasters across the globe, and foundational papers that delve into the philosophical underpinnings of disaster management. Noteworthy in its stature, the IJDRR holds indexation in both Scopus and Web of Science (WoS). Impressively, it boasts an impactful 2022 impact factor of 5.0, as documented by Journal Citation Reports (JCR), and a commendable 2020 Cite Score of 7.4, according to Scopus records. In order to elucidate the dynamics of paper submission and publication within the International Journal of Disaster Risk Reduction (IJDRR), a comprehensive bibliometric analysis coupled with visualization techniques was employed on the corpus of 1876 articles published between 2012 and 2020. This comprehensive analysis unveils not only emerging research trends but also provides insights into eminent scholars within the field while shedding light on the geographic locations where DM research is currently being conducted. Given the expansive geography and populous nature of India, comprehending its position in internationally recognized DM research assumes paramount importance, owing to the diverse range of disasters, encompassing both natural and anthropogenic origins, to which the nation is exposed. Furthermore, this analysis brings to the forefront the existence of an unequal playing field for disaster victims, a disconcerting reality that will be unmistakably underscored as the study progresses.

The primary objective of this study is to decipher any incongruity that may exist between the geographical origins of highly cited papers and the locales that encounter the highest frequency of disasters across the globe. This will be achieved through the execution of the following: (1) Analyze the year-wise publications and citations of IJDRR papers. (2) Examine the association of citations with the age of publications. (3) Identify the most productive and influential authors, organizations, and countries in disaster research. (4) Cluster the keywords used in IJDRR papers. (5) Identify the cited sources in IJDRR papers. (6) Identify the top-cited authors in IJDRR papers.

Background

An initial exploration conducted on Google Scholar (GS), utilizing the keywords "Disaster Management" within the paper titles, yielded a plethora of journals that encompass research within the domain. Notable among these publications are Natural Hazards, Annals of Tourism Research, Computer Networks, International Journal of Emergency Management, Progress in Disaster Science, International Journal of Hospitality Management, International Journal of Information Management, International Journal of Geographical Information Science, and Disaster Prevention and Management. However, two specific journals, namely the International Journal of Emergency Management and the International Journal of Disaster Risk Reduction, center their focus on Disaster Science and the intricacies of its management. Engaging in the bibliometric analysis of such scholarly outlets provides authors with invaluable insights into potential avenues that warrant further exploration and offers opportunities to establish collaborations with esteemed researchers possessing noteworthy publication records. However, it is important to acknowledge that such investigations also bring to light existing disparities in research pertaining to ecological contexts, encompassing factors such as class, gender, human development, cultural norms, media, and societal biases, as previously elucidated in the relevant literature (Roysircar et al., 2013). The research conducted by Mokhtari et al. (2021) embarked upon a comprehensive bibliometric analysis of the Journal of Documentation's scientific contributions spanning from its inception in 1945 to 2018, thereby providing a panoramic overview and visual representation of the journal's scholarly impact. Similarly, Yanbing et al. (2020) harnessed the power of bibliometric methodologies to delineate dynamic publication trends, and identify influential authors, institutions, countries, and research teams within the Journal of Nursing Management, focusing on the time period from 1993 to 2018. In a parallel vein, Xu et al. (2018) undertook a meticulous bibliometric analysis of the International Journal of Machine Learning and Cybernetics, delving into citation characteristics, international and institutional collaborations, author cooperation rates and degrees, as well as the geographical distribution of published papers spanning from 2010 to 2017. Collectively, these investigations serve as compelling examples that exemplify the immense value of employing bibliometric analysis in unveiling research patterns and elucidating influential researchers in diverse scientific domains.

Methodology

For this investigation, an extensive dataset was amassed from Scopus, recognized as the foremost and extensively utilized database for indexing and abstracting peer-reviewed scholarly literature (De Moya-Anegon et al., 2007; Herrera-Franco et al., 2020). On January 13, 2021, a meticulous search was conducted within the Scopus database to retrieve papers published within the International Journal of Disaster Risk Reduction (IJDRR) from the period spanning 2012 to 2020. The data extraction process from Scopus was executed using

the following search formula: SO = "INTERNATIONAL JOURNAL OF DISASTER AND RISK REDUCTION" AND PUBYEAR < 2021.

The preliminary exploration of the Scopus database yielded a substantial corpus of 1876 papers published within the IJDRR during the timeframe of 2012 to 2020. To dissect and comprehend this rich dataset, VOSviewer, a cutting-edge scientometric mapping software, was employed as the analytical tool of choice (van Eck and Waltman, 2010). The comprehensive bibliometric analysis encompassed diverse methodologies, including citation analysis, bibliographic coupling, as well as co-occurrence and co-citation analysis. Co-occurrence analysis was leveraged to unveil significant and frequently recurring terms and keywords within the scholarly discourse, while co-citation analysis served as a robust mechanism for identifying the authors and references that commanded the highest frequency of citations.

Analysis and Interpretation

The Highly cited Papers of the IJDRR in Scopus

A thorough investigation using the Scopus database uncovered a significant collection of 1876 papers published in the IJDRR during the period from 2012 to 2020. Remarkably, this corpus amassed an impressive total of 17,940 citations, resulting in an average of 9.56 citations per paper. Notably, 1557 papers received at least one citation, while 319 papers remained uncited. The cited papers exhibited a wide range of citation counts, ranging from a minimum of one citation to a remarkable maximum of 247 citations. To highlight the most influential contributions, Table 1 presents the top nine highly cited papers, each surpassing the threshold of 100 citations. The table includes crucial details such as the total citation count, age of the papers, and citation density, which provides valuable insights into the average yearly citation rate. The paper titled "Risk Interpretation and Action: A conceptual framework for Responses to natural hazards" by Eiser et al. (2012) ranks second in citation density, averaging 30.88 citations per year. The second most cited paper, "Social Vulnerability to Floods: Review of case studies and Implications for Measurement" by Rufat et al. (2015), received 195 citations and holds the top position in citation density with a rate of 39 citations per year. The paper "A Review of informal volunteerism in Emergencies and Disasters: Definition, opportunities, and Challenges" by Whittaker et al. (2015) secured the third position with 141 citations. Finally, the paper with the third-highest citation density, at 36.67 citations per year, is "Facility location optimization model for emergency humanitarian logistics" by Boonmee et al. (2017).

Table 1. Highly-cited Papers of the Journal IJDRR in Scopus.

	Article	Citation Count (Scopus)	Age of Publication	Citation Density (rank)
1	Eiser, R.J., Bostrom, A., Burton, I., Van Der Pligt, J., & White, M. P. (2012). Risk interpretation and action: A conceptual framework for responses to natural hazards. 1(1), pp. 5-16.	247	8	30.88 (2)
2	Rufat, S., Tate, E., Burton, C.G., & Maroof, A.S. (2015). Social vulnerability to floods: Review of case studies and implications for measurement, 14, pp. 470-486.	195	5	39 (1)
3	Whittaker, J., McLennan, B., & Handmer, J. (2015). A review of informal volunteerism in emergencies and disasters: Definition, opportunities and challenges, 13, pp. 358-368.	141	5	28.2 (4)
4	Potter, S. H., Becker, J. S., Johnston, D. M., & Rossiter, K. P. (2015). An overview of the impacts of the 2010-2011 Cantebury earthquakes. 14, pp. 6-14.	114	5	22.8 (5)
5	Boonmee, C., Arimura, M., & Asada, T. (2017). Facility location optimization model for emergency humanitarian logistics, 24, pp. 485-498.	110	3	36.67 (3)
6	Rose, A., & Krausmann, E. (2013). An economic framework for the development of a resilience index for business recovery, 5, pp. 73-83.	110	7	15.71 (9)
7	Hiwasaki, L., Luna, E., Syamsidik, & Shaw, R. (2014). Process for integrating local and indigenous knowledge with science for hydro-meteorological disaster risk reduction and climate change adaptation in coastal and small island communities, 10, pp. 15-27.	106	6	17.67 (7)

8	Ahsan, M. N., & Warner, J. (2014). The socioeconomic vulnerability index: A pragmatic approach for assessing climate change led risks-A case study in south-western coastal Bangladesh	103	6	17.17 (8)
9	Haraguchi, M., & Lall, U. (2015). Flood risks and impacts: A case study of Thailand's floods in 2011 and research questions for supply chain decision making, 14, pp. 256-272.	102	5	20.4 (6)

The Year-wise Publications and Citations of Papers

Table 2 presents the year-wise publication and corresponding citations in the IJDRR from 2012 to 2020. The publication of papers in the journal exhibited a linear growth pattern over the nine-year period, with the highest number of papers published in 2020 (31.34% of the total papers published since 2012). The total citations for the papers published during this period ranged from 782 to 3079. Notably, the papers published in 2018 received the highest total citations, with 3079 (17.16% of the total received citations during the publication period). Figure 1 visually depicts the increasing citation trend of papers published from 2012 to 2020, supported by the positive slope of the trend line (R2 = 0.04). However, the average citations of the papers exhibit a declining trend, despite an increase in the number of published papers. The year 2012 stands out with the highest average citations (43.61) among the papers published in the journal. In contrast, from 2013 to 2020, the average citations of the papers are relatively lower compared to the initial publication year, even though there was no decrease in the number of published papers during these years.

Table 2. Year-wise Publications and Citations of Papers.

Publication Year	No. of Papers	Percentage of Total Papers (1876)	Total Citations	% of Total Citations (17940)	Mean Citation
2012	18	0.96%	785	4.38%	43.61
2013	40	2.13%	1030	5.74%	25.75
2014	95	5.06%	2166	12.07%	22.80
2015	131	6.98%	3025	16.86%	23.09
2016	146	7.78%	2305	12.85%	15.79
2017	210	11.19%	2957	16.48%	14.08
2018	320	17.06%	3079	17.16%	9.62
2019	328	17.48%	1811	10.09%	5.52
2020	588	31.34%	782	4.36%	1.33
Total	**1876**	**100%**	**17940**	**100%**	**9.56**

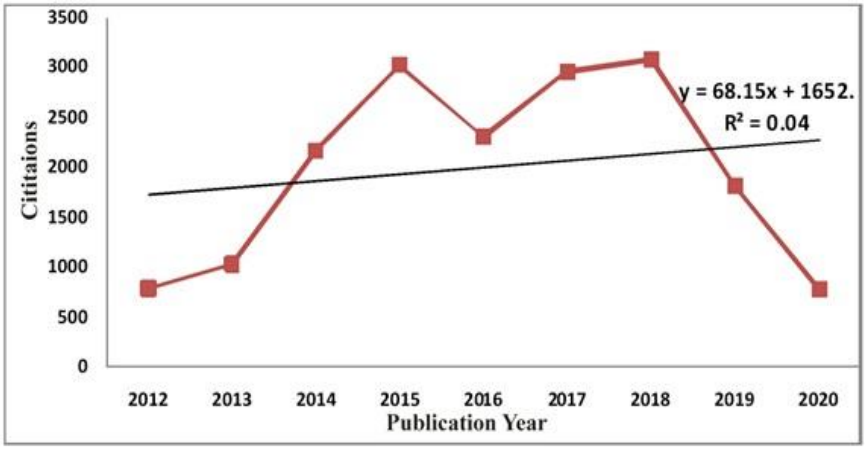

Fig. 1. The citation trend, year-wise of published articles.

Association of Citations with Age of Publications

The distribution of citation values and the age of publication of the papers deviated from normality (Shapiro-Wilk test; $p < 0.01$). Therefore, Spearman's correlation test was employed to examine the association between these two variables. The results of the correlation analysis indicate a significant positive correlation between the citation count and the age of publication of the papers (correlation coefficient = 0.738, $p < 0.01$) (Table 3). These findings suggest that older papers tend to receive more citations.

Table 3. Association of Citations with Age of Publication.

			Citations	Age of Publication
Spearman's rho	Citations	Correlation Coefficient	1.000	.738**
		Sig. (2-tailed)	.	.000
		N	1876	1876
	Age of Publication	Correlation Coefficient	.738**	1.000
		Sig. (2-tailed)	.000	.
		N	1876	1876

**Correlation is significant at the 0.01 level (2-tailed).

Table 4. Highly Productive Authors.

Sl. No.	Authors and Affiliation	No. of Papers	Citations	% of Total Citations (17940)	Average Citations	H index (Scopus)
1	**Johnston, D. M.** Professor of Disaster Management, School of Psychology, Massey University, New Zealand.	30	827	4.61%	27.57	38
2	**Paton, D.** College of Health Sciences/Discipline of Psychology, University of Tasmania, Australia	14	546	3.04%	39	39
3	**Esteban, M.** Graduate School of Frontier Science, The University of Tokyo, Japan	12	221	1.23%	18.42	26
4	**Liu, Y.** Department of Health Service, Faculty of Health Service, Naval Medical University, Shanghai, China	12	116	0.65%	9.67	5
5	**Wang, Y.** China Institute of Water Resources and Hydropower Research, Beijing, China	12	72	0.40%	6	-
6	**Li, Y.** Dept. of Civil Engineering, Case Western Reserve University, USA.	11	41	0.23%	3.73	-
7	**Becker, J.S.** Senior Lecturer at the Joint Centre for Disaster Research, School of Psychology, Massey University, New Zealand	11	285	1.59%	25.91	21
8	**Shaw, R.** Professor, Graduate School of Media and Governance, Keio University, Japan	10	201	1.12%	20.1	29
9	**Doyle, E. E. H.** Massey University Wellington, Joint Centre for Disaster Research, Senior Lecturer, New Zealand	10	146	0.81%	14.6	15
10	**Mcclure, J.** Faculty, Victoria University, Wellington.	10	422	2.35%	42.2	27

Most Productive Authors

A total of 5243 authors contributed papers to the journal between 2012 and 2020. To focus on authors with significant contributions, we established a threshold of at least five papers, resulting in 79 authors for the

analysis. Figure 2 displays the density map of the most productive authors, with font size and background color reflecting the number of papers published. Authors with a greater number of papers have larger font sizes and more yellow backgrounds.

Table 4 presents the most productive authors with at least 10 papers published in the journal. The results show that Johnston, D. M. was the most productive author with 30 papers, followed by Paton, D. (n = 14), Esteban, M., Liu, Y., and Wang, Y. (n = 12 papers each), Li, Y. and Becker, J. S. with 11 papers each. Shaw, R., Doyle, E.E.H., and McClure, J. each contributed 10 papers.

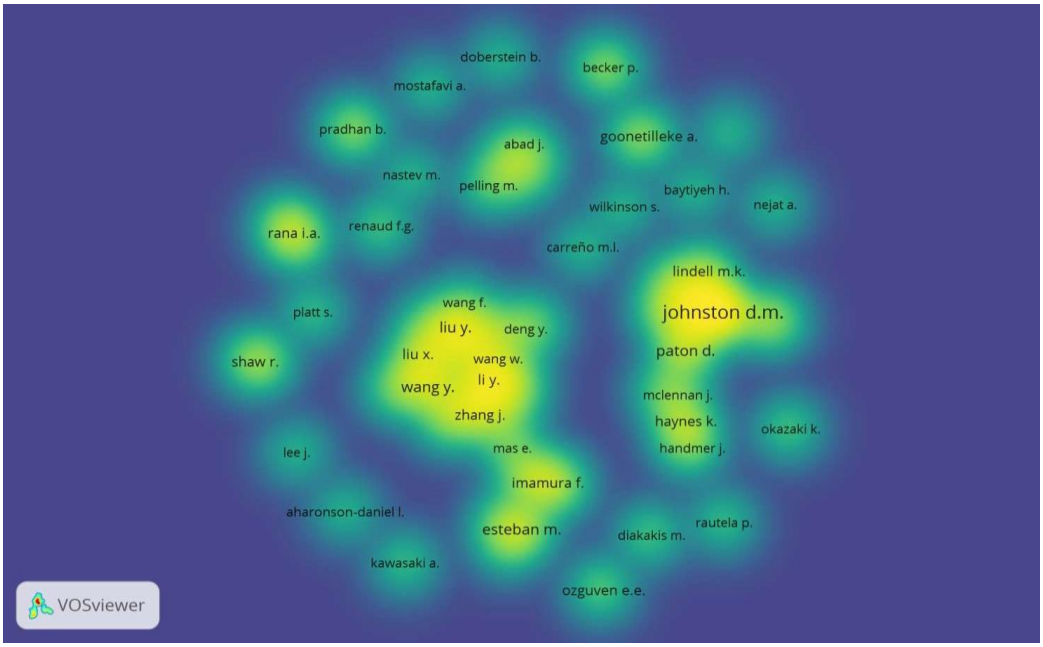

Fig. 2. Most Productive Authors (Density Visualisation).

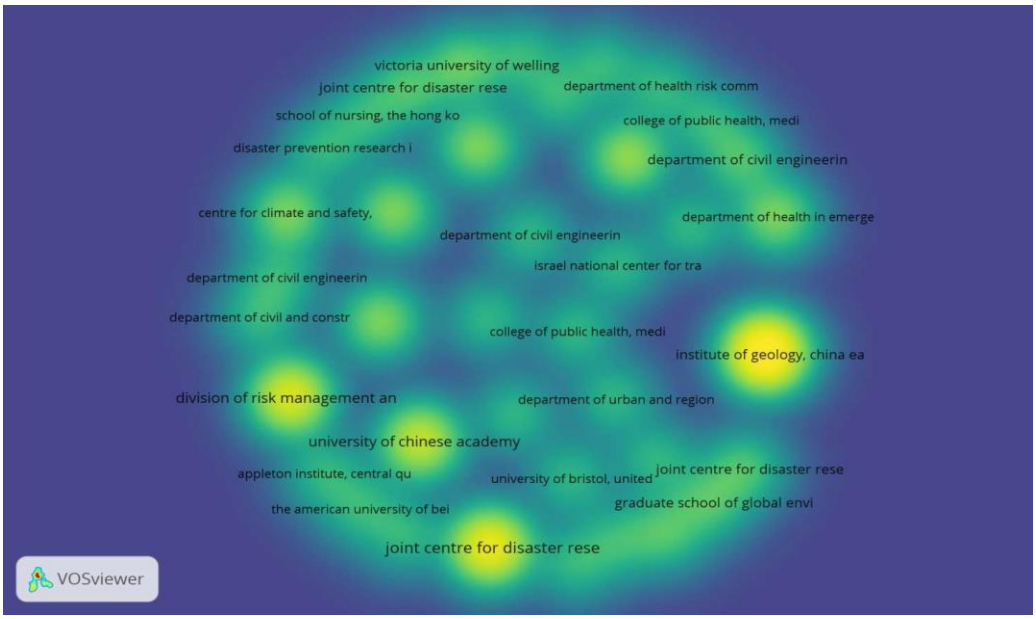

Fig. 3. Institutions Contributing High Number of Papers (Density Visualization).

Most Productive Institutions

Figure 3 illustrates the visualization of the most productive organizations that have contributed papers to IJDDR from 2012 to 2020. Out of the 4564 organizations, we selected 55 institutions and departments with a minimum of three documents for mapping. In the density map (Fig. 3), organizations with the highest number of contributions are represented by a larger font size and a more yellow background. Table 5 provides an overview

of the most productive organizations with at least five contributions to the journal. The Joint Centre for Disaster Research, Massey University, New Zealand emerges as the most productive institution with eight papers. It is followed by the Division of Risk Management and Societal Safety, Lund University, Sweden, and the University of Chinese Academy of Sciences, both of which contributed six papers. Furthermore, the Institute of Geology, China Earthquake Administration, and Victoria University of Wellington, New Zealand each contributed five papers to the journal.

Table 5. Most Productive Institutions.

Sl. No.	Institution	No. of Papers	Citations	% of Total Citations (17940)	Average Citations
1	Joint Centre for Disaster Research, Massey University, Wellington, New Zealand	8	151	0.84%	18.88
2	Division of Risk Management and Societal Safety, Lund University, Sweden.	6	55	0.31%	9.17
3	University of Chinese Academy of Sciences, Beijing, China.	6	24	0.13%	4
4	Institute of Geology, China Earthquake Administration, Beijing, China	5	12	0.07%	2.4
5	Victoria University of Wellington, New Zealand.	5	41	0.23%	8.2

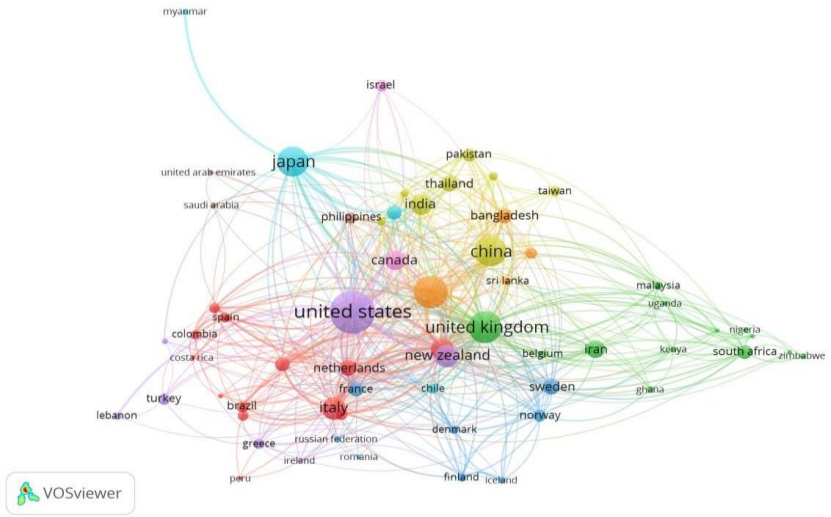

Fig. 4. Bibliographic Coupling Network of Highly-productive Countries Contributing Papers in IJDRR.

Table 6. Most Productive Countries.

Sl. No.	Country	Papers	Citations	% of Total Citations (17940)	Average Citations
1	United States	374	3478	19.39%	9.3
2	Australia	215	2828	15.76%	13.15
3	United Kingdom	206	1942	10.82%	9.43
4	China	199	1266	7.06%	6.36
5	Japan	185	2093	11.67%	11.31
6	New Zealand	105	1566	8.73%	14.91
7	Italy	103	1237	6.90%	12.01
8	Germany	98	1017	5.67%	10.38
9	India	91	1014	5.65%	11.14
10	Canada	78	858	4.78%	11

Most Productive Countries

During the analyzed period, authors from 129 countries made contributions to IJDDR. Table 6 presents the top ten countries with the highest productivity in terms of published papers in the journal. The United States leads the list, contributing 374 papers, accounting for 19.39% of the total published papers. Australia, the United Kingdom, China, and Japan follow the United States in terms of productivity.

Figure 4 illustrates a bibliographic coupling map featuring the most active countries that have published a minimum of five papers in IJDDR within the specified period. Among the 62 countries meeting this criterion, the size of the circles corresponds to each country's respective contribution share. The links between the circles denote connections among countries that have contributed to IJDDR.

Co-occurrence Map of Keywords of Papers Published in IJDRR

To gain insights into the research trajectory of Disaster Management, the utilization of a co-occurrence map of keywords proves valuable in uncovering the foremost topics currently studied and published, as well as the subjects currently prioritized by disaster management researchers. Within the studied period, the papers published in IJDRR employed a total of 4,941 unique keywords. Employing a clustering technique facilitated the identification of the most frequently occurring keywords. Utilizing co-occurrence analysis, the noteworthy and highly recurring terms and keywords within the papers were identified (Laengle et al., 2018). Figure 5 presents the network depicting the co-occurrence of 223 keywords that appeared a minimum of five times. By employing VOSviewer, 11 clusters of keywords were identified. This approach offers a comprehensive panorama of the research landscape, enabling researchers to identify emerging and crucial areas for future investigation within the realm of Disaster Management.

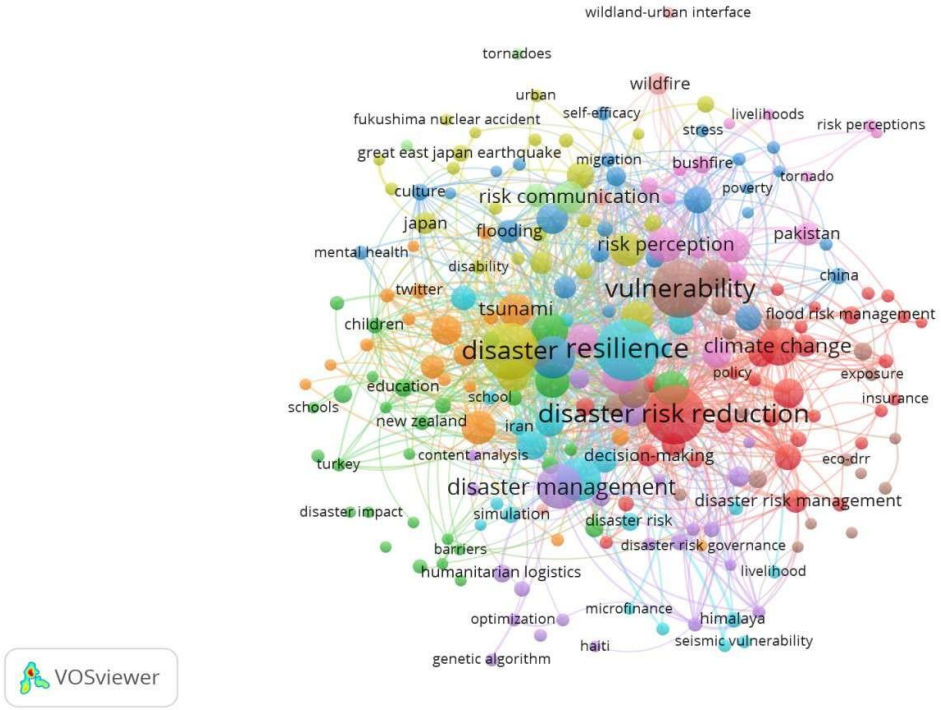

Fig. 5. Network Analysis of Keywords of IJDRR Papers.

Figure 5 presents a visual representation of the co-occurrence map of keywords in Disaster Management research. This visualization showcases the noteworthy and highly recurring terms and keywords utilized in the papers published in IJDRR during the study period. The size of the nodes corresponds to the frequency of the keywords, with larger nodes representing higher frequency. The thickness of the edges indicates the proximity of interactions between two nodes. The nodes are color-coded to indicate their respective clusters. By employing VOSviewer, a total of 11 keyword clusters were identified. These clusters can be arranged and classified based on their importance, with the most significant ones given priority.

Cluster#1 (Red colour): Climate change adaptation and disaster risk reduction is the most important cluster
Cluster#2 (Green): Preparedness in emergencies, especially flooding
Cluster#3 (Blue): Gender roles in disasters, especially in Bangladesh

Cluster#4 (Yellow): Disaster recovery and role of social capital
Cluster#5: Disaster resilience and disaster decision-making process
Cluster#6: Earthquakes, and hazards and community resilience in post-disaster recovery
Cluster#7: Management and response to disasters like Tsunamis, and the community resilience in such management and the use of social media in framing the response to disaster
Cluster#8: Vulnerability and adaptation to disasters like landslides, and its mitigation
Cluster#9: Attitude towards, and the perception of risk in the management of risk in natural disasters
Cluster#10: Risk mitigation in wildfires and the forest–urban interface risk
Cluster#11: Risk communication in natural hazards, especially in the case of tornadoes

The analysis of keyword clusters provides valuable insights into the predominant areas of focus in disaster management over the past decade. With the recognition of climate change as a significant threat to global well-being, researchers and funding agencies worldwide have directed their attention to various aspects of this issue. This trend is evident in the keyword clustering of IJDRR papers, as depicted in Figure 5 and summarized in Table 7. The most prominent cluster revolves around climate change adaptation and disaster risk reduction, highlighting its importance in current research. The remaining keywords within the clusters can be categorized into two main groups: (1) processes related to disaster management and (2) the phenomenon of disasters itself. The former group encompasses themes such as emergency preparedness, gender roles in disasters, disaster recovery, social capital, disaster resilience, disaster decision-making, community resilience, post-disaster recovery, disaster response, vulnerability and adaptation, attitudes and perceptions of risk, risk mitigation, and risk communication. These areas represent the forefront of disaster research and are interconnected in their relevance and implications.

Table 7. Keyword co-occurrence clusters.

Category		Category label	Clusters
I		**Climate change adaptation and disaster risk reduction**	Cluster#1
I		**Processes related to disaster management**	Clusters#2- #11
	i	Preparedness in emergencies Gender roles in disasters Disaster recovery Social capital Disaster resilience Disaster decision making Community resilience Post-disaster recovery Disaster Response Community resilience Vulnerability and adaptation Attitude towards and perception of risk Risk mitigation Risk communication	
	ii	Flooding Bangladesh Earthquakes Tsunami Landslides Natural disasters Wildfires Forest–urban interface risk Tornadoes	Clusters#2- #11

The second category encompasses keywords such as flooding, earthquakes, tsunami, landslides, natural disasters, wildfires, forest-urban interface risk, and tornadoes. Notably, Bangladesh is the sole country mentioned among the keywords and is closely associated with flooding. The recurring floods in Bangladesh

have posed significant challenges to both government and non-governmental efforts in mitigating this recurring disaster, leading to extensive research in this area. A similar observation was made by Wang et al. (2021), who found Bangladesh as the sole country within their keyword co-occurrence cluster in their study on disaster risk management in a changing climate. In contrast, none of the African nations emerge as frequently occurring keywords in our study, consistent with the findings of Wang et al. (2021). However, it is important to note that these areas of concern hold great significance for African nations and the Global South at large. Notably, approximately 70% of global disaster-related fatalities occur in Africa and Asia combined, while Europe and North America account for only 30% (Guha-Sapir et al., 2017).

Most Cited Sources in IJDRR Papers

Based on the reference lists of the 1876 papers published in IJDRR from 2012 to 2020, a total of 25,769 sources were cited. To provide insights into the most influential sources, Figure 6 displays the co-citation map of the 50 most cited sources in the journal papers, each with a minimum of 138 citations. The top ten most cited sources are presented in Table 8, with Natural Hazards leading the list with 2517 citations, followed by IJDRR and Disasters. It is worth noting that Jàmbá: Journal of Disaster Risk Studies, the only African-based disaster management journal with a specific focus on disaster risk reduction and management in developing communities, particularly in Africa, is not among the most cited sources. This observation underscores the limited representation of African research and perspectives within the existing disaster management literature.

Table 8. Most Cited Sources in IJDRR Papers.

Sl. No.	Journal	Citations	Impact Factor (2022)	SJR (2022)
1	Natural Hazards	2517	3.70	5.5
2	International Journal of Disaster Risk Reduction	2358	5.00	7.4
3	Disasters	1276	3.20	6.0
4	Risk Analysis	1036	3.80	7.8
5	Natural Hazards and Earth System Sciences	867	4.60	6.8
6	Natural Hazards Review	546	2.70	4.2
7	Disaster Prevention and Management	407	-	3.8
8	Earthquake Spectra	406	5.00	7.1
9	Environmental Hazards	386	3.78	7.7
10	European Journal of Operational Research	349	6.40	11.2

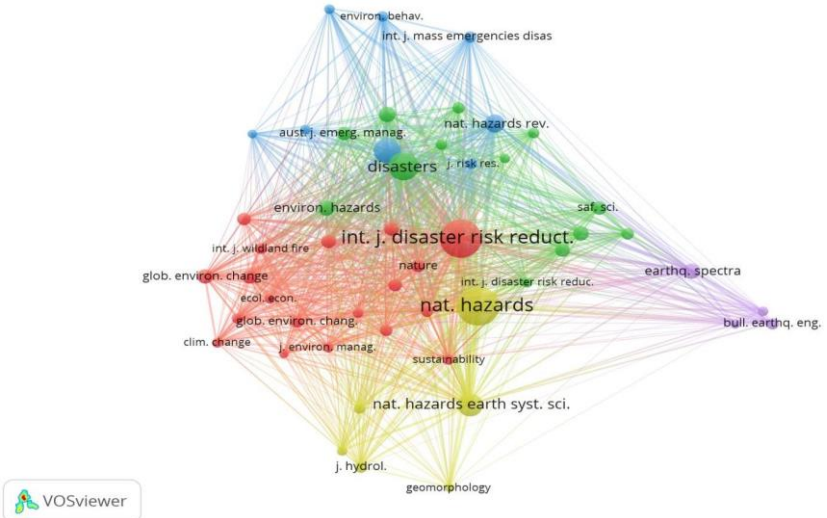

Fig. 6. Co-citation Map of 50 Sources Most Cited in IJDRR.

Figure 6 presents the co-citation map of the cited journals in IJDRR papers. The size of the circles or font in the map represents the density of citation numbers. Larger circles or font sizes indicate higher citation

frequencies. In the depicted map, IJDRR, given its prestige and influential role in the field of disaster research, emerges as the second most highly-cited source for its papers.

Most Cited Authors in the IJDRR Papers

Overall, 96320 authors have been cited in 1876 papers published in IJDRR between 2012- 2020. The co-citation network map of 94 authors with a minimum citation of 100 is given in Figure 7. Table 9 shows the list of ten highly cited authors. Cutter, S. L. was the most highly cited author in references of IJDRR papers with 694 citations. Paton, D. and Johnston, D.M. with 681 and 676 citations were ranked second and third.

Table 9. Most Cited Authors.

Sl. No	Author	Affiliations	Citations
1	Cutter, S.L.	University of South Carolina, USA	694
2	Paton, D.	University of Tasmania, Australia	681
3	Johnston, D.M.	Massey University, New Zealand.	676
4	Lindell, M.K.	University of Washington, USA	665
5	Wisner, B.	University College London, UK	473
6	Shaw, R.	Keio University, Japan	418
7	Birkmann, J	University of Stuttgart, Germany	361
8	Cannon, T	University of Sussex, UK	347
9	Kelman, I.	University of Agder, Norway	324
10	Pelling, M.	King's College London, UK	305

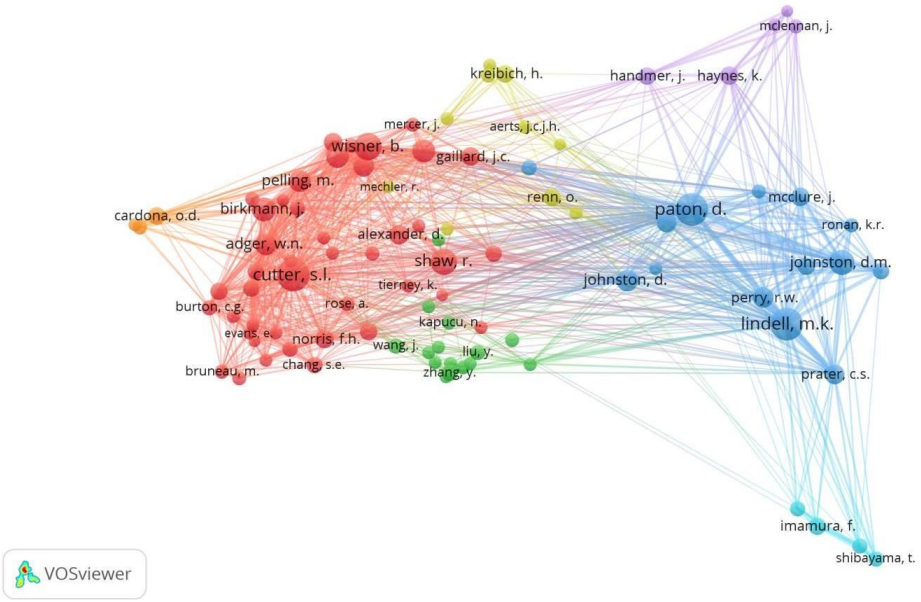

Fig. 7. Co-citation Network Map of 94 Authors Cited in IJDRR papers.

Discussion and Conclusion

During the period from 2012 to 2020, Johnston D. M. emerged as the author with the highest number of publications in IJDRR, having contributed 30 papers, followed by Paton D. with 14 papers. Johnston's articles received a total of 827 citations, resulting in an average citation count of 27.57 per paper. Notably, Mcclure J.'s ten articles attained the highest average citation count of 42.2. Among the institutions frequently affiliated with IJDRR, notable mentions include Massey University, Lund University, the University of Chinese Academy of Sciences, and China Earthquake Administration. Massey University contributed eight papers, which received an average citation count of 18.88 and a total of 151 citations. The United States leads in terms of the number of papers published in IJDRR, contributing 374 papers, followed by Australia, the United Kingdom, China, Japan, New Zealand, Italy, Germany, India, and Canada. Notably, the United States also attained the highest citation count of 3478, accounting for 19.39% of the total citations. Among the countries affiliated with the authors, New Zealand achieved the highest average citation count of 14.91 for their 105 papers.

Guha-Sapir et al. (2017) highlight that Southeast Asia, Asia Pacific, and Africa are the regions most impacted by natural and other disasters. However, when comparing this data on disaster geography with the countries contributing the most publications in IJDRR, there appears to be a limited correlation between the number of disasters in a country and the number of papers published about them. Nevertheless, countries such as the USA, China, India, and Japan, which experience a relatively high frequency of disasters, exhibit a higher representation in disaster-related papers. Conversely, countries like Indonesia and the Philippines, despite facing a high occurrence of disasters, have published fewer papers. The situation is further concerning when considering the number of fatalities per 100,000 inhabitants. Countries like Haiti, Fiji, and Ecuador have experienced significant fatalities in disasters but have a minimal presence in the published papers of IJDRR. This suggests that disaster reporting and research predominantly focus on relatively affluent nations, while there is limited research and reporting from the countries most severely affected by disasters. Berlemann and Thomas (2019) raise a pertinent question regarding the potential impact of a "distance bias" on the research focus and reporting in disaster management. They inquire whether research papers primarily highlight the urgent issues of disaster management in resource-constrained developing countries or if they predominantly concentrate on well-studied issues repeatedly investigated and reported from geographically accessible locations.

Similarly, Besley and Burgess (2002) have posited that government responsiveness to citizen demands in Indian states relies on literacy levels and media penetration. Additionally, Strömberg (2007) has argued that disaster reporting influences aid distribution, and the presence of such bias in research may perpetuate a disregard for understudied locations, thereby hindering meaningful scientific interventions in areas that are in dire need. Barnes et al. (2019) conducted a study on disaster-related publications and observed that a majority of corresponding authors were based in North America (59%), followed by Europe (18%), Oceania (12%), and Asia (11%). The geographical focus of these publications primarily revolved around North America (60%), Asia (18%), Europe (15%), and Oceania (7%), with minimal representation from Africa. Sahil and Sood (2021), in Table 5, also noted the absence of African countries among the most productive nations in the field of natural disaster management. North et al. (2020) coined the term "Out of Africa" in a satirical manner to highlight the lack of African authorship in high-impact geosciences literature. However, Africa has a rich heritage of utilizing indigenous knowledge to address various challenges, including disaster management, as documented by Chepchirchir et al. (2019). Regrettably, this indigenous knowledge and the work of African disaster management professionals have not received adequate exposure through international journals, as exemplified by the scarcity of citations to the Jàmbá: Journal of Disaster Risk Studies. The limited research activity in the field of Disaster Research in African and other developing nations is apparent, underscoring the need for funding agencies to facilitate the strengthening of disaster management research endeavors in universities and institutes within these nations. By doing so, they can garner international recognition and support for their specific concerns, a crucial aspect highlighted by the ongoing Covid-19 pandemic. Recognizing that the volume of attention and financial support often aligns with the intensity of public discourse, it becomes imperative for developing nations to proactively increase their research activity in Disaster Research. This concerted effort will ensure that their voices and perspectives are not only heard but also valued and embraced.

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