Scholarly Publications in The Field of Disaster Risk Reduction- A Critical Evaluation

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Abstract: *The objective of this study was to assess the scholarly literature on Disaster Risk Reduction (DRR) and determine how it has changed from 2014 to 2023. Clarivate's Web of Science database, which contains reputable and significant scientific research, was used to obtain published research articles on DRR. Numerous factors were considered, such as publications by journals, organizations, and nations, citation scores, and the increase in publications. We chose "Disaster Risk Reduction" as the key phrase for papers published during this period using state-of-the-art bibliometric techniques.The results reveal that from 2014 to 2023, 10,168 documents on DRR were published, involving 26,568 authors and 1,744 journals. Shaw R stands out significantly with the highest number of records (143) and the highest Total Global Citation Score (TGCS) (1515), indicating a robust research output and influence in the field. The* ***International Journal of DRR*** *is the dominant publication, with* ***3894 records,*** *accounting for* ***38.3%*** *of total contributions. Cutter SL (2003) leads with 429 records (4.2%), indicating a significant impact on the field. his foundational work has likely shaped subsequent research in disaster risk. Following closely is Cutter SL (2008), with 362 records (3.6%), further emphasizing the author's influential role in disaster studies. Our findings reveal emerging trends and highlight gaps in the current literature, offering insights for future research.By providing a thorough picture of the academic environment in this important area, this report seeks to support ongoing efforts to comprehend and reduce disaster risks.*

Keywords: Disaster Risk Deduction, Scientometric Analysis, Citation Analysis, Web of Science, VOSviewer.

INTRODUCTION

Natural disasters including tsunamis, floods, earthquakes, terrorist attacks, hurricanes, and disease epidemics in addition to presenting problems for society, also put human lives, financial stability, and security at risk because of the harm they cause to the environment. (Shan et al. 2019; Kaur and Sood 2019). A natural disaster claimed 22,764 lives in 2015; it also caused financial damages totalling US$ 70.3 billion worldwide and 110.3 million injuries (Debarati et al. 2016). Natural catastrophes are beyond human control, but can be significantly reduced in terms of their harmful effects and various dangerous ramifications with careful planning and preparation. Consequently, governments and companies worldwide are preparing to shift to catastrophic management. Governments, disaster management organizations, responders, and societies work together continuously to manage disasters. Natural and anthropogenic disasters pose serious risks to global economies, communities, and ecosystems. Given the rising incidence and severity of extreme occurrencescaused by urbanization and climate change, effective Disaster Risk Deduction (DRR) measures are essential. DRR is a significant field of study for academics and policymakers alike as it includes a wide range of activities targeted at reducing vulnerability and boosting resilience to disasters.

In response to these difficulties, the scholarly community has produced an expanding corpus of work examining the different facets of DRR. Our analysis used quantitative methods to evaluate the amount and significance of DRR research. Influential publications, prolific authors, and leading institutions contributing to the field ware investigated. Furthermore, we examine the interdisciplinary nature of DRR studies, emphasizing the integration of knowledge from various domains such as environmental science, engineering, social sciences, and the public. This work supports the larger objective of increasing global resilience to disasters in addition to serving as a resource for scholars and practitioners.Scientometrics is being used toanalyze research on disaster risk perception will help researchers better grasp the field's position and significance, uncover its internal development law and foster sustainable growth in the field. This study's primary goals were to: (1) examine disaster risk reduction research themes and hotspots; (2) assess how disaster risk reduction researchers and institutions are distributed and collaborate; and (3) evaluate the state of disaster risk reduction research.

REVIEW OF LITERATURE

A Scientometric Analysis of ICT-Assisted Disaster Management examines the role of Information and Communication Technology (ICT) in disaster response,

highlighting key applications like big data analytics, artificial intelligence, and UAV technology. It discusses the growing use of scientometric analysis in tracking research trends, citing works by Chen (2017) and Cobo et al. (2012) on science mapping. The review also addresses challenges such as data quality in volunteered geographic information (VGI) and the reliability of social media for disaster assessment, referencing studies by Senaratne et al. (2017) and Shan et al. (2019).

Cobo et al. (2014) discuss science mapping tools that aid in analyzing disaster research trends, while Li and Chen (2017) highlight the impact of text mining and visualization techniques in bibliometric studies . Similarly, Maza et al. (2011) explore the role of multi-UAV coordination in disaster response, showcasing technological advancements in emergency management . Moreover, Grothmann and Reusswig (2006) examine the psychological and behavioral dimensions of disaster preparedness, shedding light on why some individuals take precautionary measures while others do not. These studies collectively underscore the interdisciplinary nature of disaster risk research, integrating technological, psychological, and methodological persp-ectives to enhance resilience and response strategies.

Du et al. (2020) carried out an extensive network study in disaster emergency management, highlighting the role of ICT in coordinating disaster response efforts . Erdelj et al. (2017) explored the integration of unmanned aerial vehicles (UAVs) in disaster management, emphasizing their potential in real-time monitoring and response . Meanwhile, studies on urban disaster resilience hasincreased prominence, particularly after 2001, when resilience began being applied to urban contexts (Int. J. Environ. Res. Public Health, (2021)

OBJECTIVE:

Analysing academic papers and research trends in the area of DRR is the study's goal. This study aims to identify key contributors, geographical and institutional patterns, and the overall impact and dissemination of DRR research by examining the distribution of records by document type, language, institution, and country, as well as citation metrics such as Total Local Citation Score (TLCS) and Total Global Citation Score (TGCS). This thorough examination will shed light on the current condition of DRR scholarship, highlight significant publications and new developments, and offer recommendations for future lines of inquiry in this important field.

MATERIALS & METHODS:

Owing to its wide coverage and excellent publication quality, the research papers included were taken from the Web of Science database and utilized in this study. Co-citation, co-authorship and co-occurrence analyses of organizations, countries, authors, keywords, and references in this field were analyzed and visualized through a systematic review with scientometric analysis. They employed the HistCite and VOSviewer tools for advanced analysis, and Microsoft Excel was used to present the tables and graphs.

ANALYSIS AND FINDINGS:

Table 1 provides an overview of various authors' academic contributions, measured through metrics such as publication count, percentage of contributions, H-Index, Total Global Citation Score (TGCS), TGCS per year (TGCS/t), and Total Local Cited Reference (TLCR). Shaw R stands out significantly with the most records (143) and the most TGCS (1515), indicating a robust research output and influence in the field. Other notable contributors include Amaratunga D and Kelman I, although their total records (43 and 39, respectively) are much lower than those of Shaw. Each author has a different H-Index, which gauges their productivity and citation impact. Shaw R has the highest H-Index (20), suggesting a consistent level of impactful research. This analysis underscores the importance of quantity and quality in academic research.

Table 1. Authors Research outputs on Disaster Risk Deduction

S.No	Author	No of Records	Percentage	H-Index	TGCS	TGCS/t	TLCR
1	Shaw R	143	1.4	20	1515	241.36	132
2	Amaratunga D	43	0.4	13	405	62.98	81
3	Kelman I	39	0.4	15	1096	134.83	63
4	Li Y	37	0.4	17	610	125.17	58
5	Liu Y	36	0.4	15	654	123.53	48
6	Murray V	36	0.4	18	1044	132.61	31
7	Haigh R	33	0.3	12	316	45.86	54
8	Rana IA	32	0.3	15	825	168.45	139
9	Johnston D	31	0.3	13	768	100.63	68
10	Imamura F	30	0.3	10	319	50.17	32
11	Gaillard JC	28	0.3	15	696	83.82	19
12	Di Baldassarre G	27	0.3	18	1140	201.07	66
13	Paton D	27	0.3	16	880	120.07	92
14	Wang Y	27	0.3	15	586	140.64	40
15	Wilkinson S	27	0.3	12	417	69.45	46

TLCS –Total Local Citation Score, TLCS/t –Total Local Citation Score per year, TGCS –Total Global Citation Score, TGCS/t –Total Global Citation Score, TLCR – Total Local Cited Reference

Figure: 1 Journals wise distribution of Disaster Risk Reduction

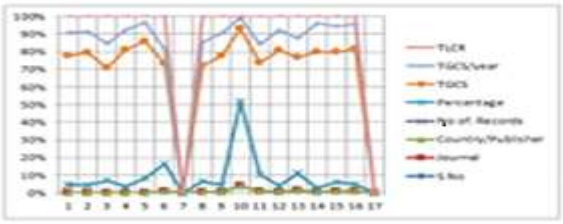

Figure: 1 Journals wise distribution of Disaster Risk Reduction

Figure 1 offers an extensive summary ofthe various journals and conferences related to DDR and related fields. he International Journal of DRR is the dominant publication, with 3894 records, accounting for 38.3% of the total contributions. It also boasts a high TLCS (7095) and TGCS (62597), indicating both substantial local and global impacts. Natural Hazards and Sustainability followed, with 252 and 248 records, respectively. This suggests that these journals may be increasingly recognized for their impactful research. Several journals, such as the International Symposium on Earth Hazard and Disaster Mitigation and Water, have no TLCS, indicating the potential need for improvement in local citation visibility. This table illustrates the vibrant landscape of journals and conferences that contribute to disaster risk research. The citation metrics reveal that while some publications have high records, others achieve a significant impact with fewer contributions, reflecting diverse research priorities and community engagement in the field.

Figure 2 provides a summary of influential publications related to disaster risk and vulnerability. Cutter (2003) led to 429 records (4.2%), indicating a significant impact on the field. This foundational work has likely shaped subsequent research on disaster risks. The following is Cutter (2008), with 362 records (3.6%), further emphasizing the

author's influential role in disaster studies. Their lower record counts (220 and 209, respectively) reflect their historical context but underscore their ongoing relevance. The percentage of records indicated the relative impact of each publication in the broader literature. While Cutter SL's works dominate, other significant contributions, such as Alexander DE (2013)and Braun V. (2006), also provide critical insights, albeit with fewer records. The table illustrates a rich tapestry of research in disaster risk reduction, with a few key authors and institutions standing out due to their prolific contributions. The emphasis on both foundational studies and contemporary frameworks highlights the ongoing evolution of this field.

Figure. 2 Research output and Impact for Cited References on DRR

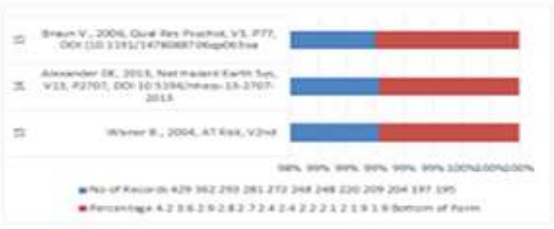

Figure. 2 Research output and Impact for Cited References on DRR

Table.3 Year wise Distribution Publication in Disaster Risk Deduction

S.No	Publication Year	No of Records	Percentage	Number of Authors	TLCS	TGCS
1	2014	381	3.7	1349	1676	10054
2	2015	482	4.7	1660	3028	15851
3	2016	648	6.4	2281	2142	14831
4	2017	761	7.5	2845	2173	15091
5	2018	1194	11.7	4390	3058	21222
6	2019	955	9.4	3601	1266	18150
7	2020	1245	12.2	5192	446	21724
8	2021	1398	13.7	6145	306	16682
9	2022	1536	15.1	6706	139	10398
10	2023	1568	15.5	6617	30	3666
Total		10168	99.9	40786	14264	147669

TLCS –Total Local Citation Score, TGCS –Total Global Citation Score

Table 3 provides an overview of research output spanning ten years, from 2014 to 2023, indicating trends in publication volume, author contributions, and citation metrics. From 381 in 2014 to 1568 in 2023, the overall number of records published rose dramatically, indicating a discernible upward trend in research efforts. Over the entire period, the total records reached 10168, with a total of 14264 authors contributing to these works. The cumulative TLCS and TGCS are significantly high, at 147669, indicating that while recent publications might have lower citation counts, the body of work as a whole has garnered substantial attention. Overall, the data reflect a thriving research landscape with increasing publications and author collaboration. However, there is a need to monitor citation trends to ensure that newer works gain recognition that they deserve over time. The research community appears to be expanding, and continued collaborative efforts may further enhance the impact and visibility of future publications.

Figure: 3 Documents Wise Distribution of Disaster Risk Deduction

A summary of the different document categories in a dataset is shown in Figure 3, which also includes information on the number of records, proportion of the entire dataset, quantity of writers, Total Local Citation Score (TLCS), and Total Global Citation Score (TGCS). Articles (7785) form the majority of the dataset, accounting for over three-quarters of all documents. Articles: The Book Chapter (488) represents a combination of articles and book chapters, with a moderate number of authors (1327) and citations. Editorial Material; Book Chapter (49) have a minimal representation with low citation scores, indicating a limited impact. Books (28) comprise a small portion of the dataset with modest citation counts, indicating their role as comprehensive resources. In summary, articles dominate the dataset, both in terms of quantity and citation impact, whereas other document types vary significantly in their representation and influence.

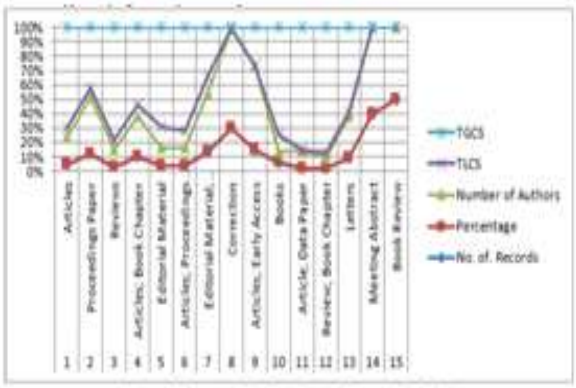

Figure: 3 Documents Wise Distribution of Disaster Risk Deduction

Table: 4 Distribution of Research Output by Language on Disaster Risk Deduction

S.No	Language	No of Records	Percentage	TLCS	TGCS
1	English	10046	98.8	14249	147504
2	Chinese	42	0.4	1	57
3	Spanish	33	0.3	8	38
4	Portuguese	13	0.1	2	12
5	French	7	0.1	1	5
6	Russian	6	0.1	0	5
7	Italian	5	0	2	6
8	Turkish	5	0	0	4
9	German	2	0	0	17
10	Korean	2	0	0	6
11	Malay	2	0	1	6
12	Croatian	1	0	0	0
13	Czech	1	0	0	0
14	Japanese	1	0	0	8
15	Slovak	1	0	0	1
16	Ukrainian	1	0	0	0

TLCS –Total Local Citation Score, TGCS –Total Global Citation Score

The dataset's record distribution by language is seen in Table 4, revealing the dominance of English (10046) in scholarly publications. English accounts for 98.8% of the records, using a substantial Total Local Citation Score (TLCS) of 14,249 and a Total Global Citation Score (TGCS) of 147,504, underscoring its prominent role in academic communication and research influence. Other languages such as Chinese, Spanish, Portuguese, French, Russian, Italian, Turkish, German, Korean, Malay, Croatian, Czech, Japanese, Slovak, and Ukrainian have minimal representation, each constituting less than 1% of the total records. Overall, the overwhelming presence of English underscores its critical importance in the global dissemination and citation of academic work.

Table: 5 Research output and Impact metrics for various Institutions on DRD

S.No	Institution	No of Records	Percentage	TLCS	TGCS
1	Kyoto University, Japan	238	2.3	487	2327
2	London's Global University, UK	200	2	742	5065
3	Chinese Academy of Sciences, China	195	1.9	175	3253
4	Tohoku University, Japan	193	1.9	385	2253
5	The University of Tokyo, Japan	146	1.4	214	2336
6	*Beijing Normal University, China*	143	1.4	251	2834
7	*Massey University,* New Zealand	115	1.1	469	2441
8	The *University* of *Auckland, New Zealand*	110	1.1	375	1818
9	The University of Academy of Sciences, China	99	1	87	1621
10	Sichuan University, China	82	0.8	110	1482
11	The *University* of *Melbourne,* Australia	81	0.8	128	1255
12	Tongji University, China	79	0.8	19	1390
13	Keio University, Japan	73	0.7	123	1082
14	United Nations University, Japan	69	0.7	101	1362
15	University of Bristol, UK	69	0.7	139	1864

TLCS –Total Local Citation Score, TGCS –Total Global Citation Score

The distribution of records by institution is seen in Table 5, showing the contributions of various universities and research institutions to the dataset. Kyoto University in Japan has 238 records, representing 2.3% of the total, with a Total Local Citation Score (TLCS) of 487 and Total Global Citation Score (TGCS) of 2327. London's Global University in the UK closely follows 200 records (2%), but boasts higher citation scores (TLCS: 742, TGCS: 5065), indicating a significant impact. Institutions from China and Japan are prominently represented, with multiple entries each, reflecting a strong research output. This distribution highlights The worldwide scope of the study, with significant contributions made by theinstitutions across Asia, Europe, and Oceaniainternational research is contributions, with significant contributions fromcountries across North America, Europe, Asia, and Oceania.

Figure: 4 Country wise Distribution of the publications on Disaster Risk Deduction

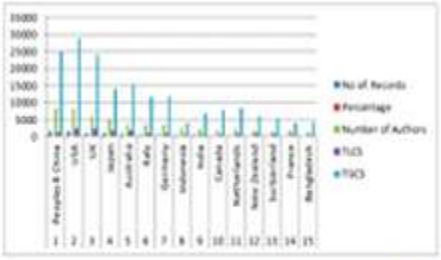

Figure: 4 Country wise Distribution of the publications on Disaster Risk Deduction

Figure 4 highlights the distribution of records by country along with the count of authors, Total Local Citation Score (TLCS), and Total Global Citation Score (TGCS). China has 1,650 records (16.2%), followed closely by the USA with 1,640 records (16.1%), each having substantial citation scores, indicating their significant contributions to the dataset. Notably, Indonesia and India had lower citation scores than their record counts. Canada, the Netherlands, New Zealand, and Switzerland each contribute around 3-3.5% of the records, with the Netherlands showing a relatively high TGCS (8,386). France, Bangladesh, and Switzerland round out the list, each contributing 2.4-2.6% of the records. This distribution highlights how

Figure: 5 Bibliographic Coupling of Organizations on Disaster Risk Deduction

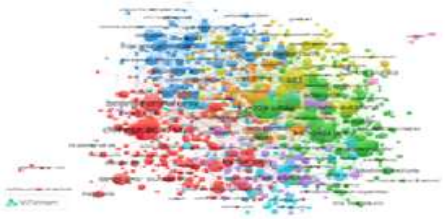

Figure: 5 Bibliographic Coupling of Organizations on Disaster Risk Deduction

Figure 5 indicates that an organization must have a minimum of five citations and five documents. Of the 8409 organizations, 984 meet the requirements, and the bibliographic coupling links' overall strengthwith new organizations will happen resolved for every one of the 984 organizations. A total of 236 organizations with bibliographic coupling links comprise Cluster 1. These organizations most likely have similar references, which suggests that their areas of specialization or research interests are similar. Cluster 2: This cluster included 196 organizations that have a bibliographic connectionties. These groups have probablyresearch links and references in common, suggesting joint efforts or similar areas of interest. Cluster 3: This cluster included 145 organizations with bibliographic coupling relationships. Common references between these organizations suggest possible cooperation and research ties.

Figure: 6 Bibliographic Coupling of Countries

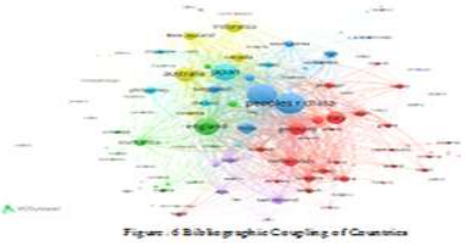

Figure: 6 Bibliographic Coupling of Countries

Figure 6 indicates that, out of the 175 nations, there must be a minimum of 25 countries for papers, a minimum of five documents per nation, and a minimum of five citations per country. Overall, the bibliographic coupling's strengthties along with another countries is determined for every one of the 121nations that meet the thresholds. The first Cluster (33) reflects a collection of nations with close co-authorship ties. A sizable portion of the nations in Cluster 2 (25) displayed co-authorship tendencies. A moderate number of nations with co-authorship ties were represented by Cluster 3 (24). These nations may collaborate continuously and add to the body of research in the RDD field. Compared with the preceding clusters, Cluster 4 (17) has fewer countries. These nations may collaborate as co-authors to some extent, possibly concentrating on certain RDD research topics.

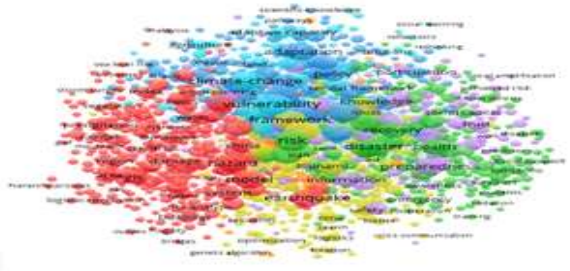

Figure: 7 Co-occurrence Networks of Keywords on Disaster Risk Deduction

The co-occurrence analysis of research terms, as shown in Figure 7, may identify important topics for articles as well as the region's hotspot and frontier knowledge in general. It is required that a keyword appear at least five times out of 27535 occurrences. The overall strength of the co-occurrence links between each of the 2271 keywords will be ascertained if 2271 of the 2271 keywords meet the requirements. Overall, the keywords with the most links will be selected. In the co-occurrence, there are ten phrase clusters and a total of 1000 keywords. Consequently, keywords are shown with a frequency in Table 6.

Table: 6 Co-Occurrence of Keywords on Disaster Risk Deduction

S. No.	Keywords	Frequency	S. No.	Keywords	Frequency
1	Vulnerability	1296	11	Earthquake	636
2	Resilience	1275	12	Preparedness	499
3	Climate-Change	959	13	Impact	543
4	Disaster Risk Reduction	1299	14	Climate Change	493
5	Risk	1039	15	Hazard	434
6	Management	906	16	Natural Disaster	405
7	Adaptation	624	17	Social Vulnerability	344
8	Disaster	782	18	Natural Hazard	375
9	Framework	583	19	Impacts	373
10	Model	708	20	Disaster	405

CONCLUSION:

In conclusion, the analysis of scholarly publications and research patterns within the area of Disaster Risk Reduction (DRR) reveals significant advancements and evolving priorities over recent decades. Key trends identified include a shift towards more interdisciplinary approaches, the addition of climate change variation with DRR strategies, an emphasis on community-based and participatory methods. The geographic distribution of research efforts highlights both global and regional focus, with a notable concentration of studies in areas that are most vulnerable to disasters. Emerging technologies and methodologies, such as remote sensing, big data analytics, and machine learning, are gaining traction and offering new avenues for improving disaster preparedness, response, and recovery. Overall, this analysis underscores the critical need for ongoing investment in DRR research and the continuous dissemination of findings to inform policies and practices. By leveraging collective knowledge and innovations within the scholarly community, we can improve global resilience and minimize the devastating effects of catastrophes on populations worldwide.

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