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EXPLORING GLOBAL TRENDS OF RESEARCH ON ORGANIZATIONAL RESILIENCE AND SUSTAINABILITY: A BIBLIOMETRIC REVIEW

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ABSTRACT

The current research presents a bibliometric review of publications on organizational resilience and sustainability publications using the Scopus database for the period 1998–2022 based on the corresponding keywords in the titles of the articles. In this study MS Excel was used for frequency analysis; Harzing's Publish or Perish to analyze citations and their metrics, while VOSviewer and Bibliometric R-tool with Biblioshiny were employed for visualization and thematic analysis. According to the findings, research on organizational resilience and sustainability gained prominence in 1998 and has steadily increased since 2005. The United States of America recorded the most productive and highest contribution, followed by the United Kingdom. The Journal of Sustainability Switzerland has published the

most papers, while the University of Canterbury, New Zealand, is the most productive institution. This research used the Scopus database. Other data sources may be accessed later, and searches may include summaries and keywords instead of document titles. To the best of the author's knowledge, this is one of the first bibliometric review studies combining organizational resilience and sustainability research in the Scopus database.

Keywords: Organizational resilience, sustainability, bibliometric analysis, thematic analysis, VOSviewer, Harzing's Publish or Perish, bibliometrix R-tool.

INTRODUCTION

In the contemporary age, the relevance of the Sustainable Development Goals (SDGs) is underscored as is the need for nations, public agencies, corporations, and communities to build capabilities in advance of potential disasters (Corrales-Estrada et al., 2021). Building organizational resilience to improve sustainability has become imperative given the constant dynamism and change in the environment (Liang & Cao, 2021; Seo et al., 2020). Building resilience capabilities will enable organizations to manage, adapt, and navigate through disruptions, uncertainties, and emerging events to promote long-term sustainability and improve organizational performance (Edgeman, 2015). Consequently, the pursuit of sustainability solutions and resilient organizations have become imperative (Redman, 2014). "There is no sustainable development without resilience, and there is no resilience without sustainable development. Building economic, social and environmental resilience must guide the recovery from the crisis" (United Nations, 2020). Approximately 420 million full time equivalent jobs (FTEs) were lost in the second and third quarters of 2020. The number of poor people was projected to increase by 131 million in 2020, representing about 9 percent of the population living in poverty. As a result of the decline in international tourism, the industry lost \$1.1 trillion, or 70 percent of its value (which was a hardship for many developing countries). Foreign and local supply networks were shaken, likely resulting in a 7.6 percent point decline in global trade in goods and services. For governments, businesses, and society to get back on their feet, they must commit to the SDGs

to brace against the threat of monetary, social, and environmental turmoil. Organizational resilience, which contributes to long-term viability, is developed by strengthening the organization's ability to adapt to new environments (Corrales-Estrada et al., 2021).

Organizational Sustainability

Despite its widespread use, the term “sustainability” could be misunderstood in some contexts, especially those whose environmental roots have given less weight (Lew et al., 2016; Marchese et al., 2018). It appears that “to maintain the status quo and not disappear” is a sufficient definition of sustainability in such contexts (Lew et al., 2016; Sayer & Campbell, 2004). The phrase “everything that ensures the well-being of societies and environment” is another example of a too general definition of sustainability (Lew et al., 2016) or “an ethical concept that things should be better in future than they are at present” (Seager, 2008). Another method to approach sustainability is “longevity,” which means “the longer a system can be sustained, the more sustainable it is.” (Lew et al., 2016; Marchese et al., 2018). In contrast, the most widely used definition of sustainability, comes from the 1987 Brundtland Commission Report and reads as follows: “development that fulfills the requirements of the present without jeopardizing the ability of future generations to satisfy their own needs” (Marchese et al., 2018; Roostaie et al., 2019). Organizational sustainability can be understood as the ability of an organization to remain competitive now and in the future. It should be noted that this ability touches on the principles of the Triple Bottom Line: economic, social, and environmental (Cavaco & Machado, 2015) and the perspective has evolved to include ethical and technological aspects (Peters & Siemaens, 2020). Moreover, sustainability and resilience are intertwined when key assets and thorough recovery processes are put in place for organizations to recover from disruptions and defend their value propositions (Pettit et al., 2019).

Organizational Resilience

Organizational resilience has been researched in a variety of fields, including psychology, ecology, economics, disaster management, sustainable development, and supply chain risk management (Bhamra et al., 2011; Hassel & Cedergren, 2021). The idea evolves and

establishes itself as the organization's ability to foresee, detect, react to, and recover from situations that threaten its existence (Alberti et al., 2018) or as a super-ability that describes the different stages of regular and evolving abilities (Musa & Suleiman, 2020): foreseeing, replicating, and adjusting (Duchek, 2020). Theories such as ecological, resource-based, and legitimacy-based economics underpin the findings on organizational resilience capabilities and show that anticipation is a capability related to preparation and resource availability (Duchek, 2020).

Rationale

Conversely, this study is important because it will enable organizations to foresee, detect, react to, and recover from situations that threaten their existence to ensure their survival and continued existence. It was conducted in response to the need for more research on organizational resilience and sustainability and seeks to clarify the contradictory results of previous research. Against this backdrop, the outcomes of previous studies on the relationship between organizational resilience and organizational sustainability have been inconclusive. The goal of this research was to analyze how trends and patterns are presented and analyzed in the published literature on organizational resilience and sustainability, and to demonstrate how one study has influenced the field and how it has evolved over time. Therefore, it is essential to investigate the potential connections between constructs, not only from a research methodology perspective but also from a theoretical and practical perspective. In this way, researchers can determine whether there is a positive, neutral, or negative relationship between organizational resilience and organizational sustainability.

Bibliometric research has proliferated in the academic community due to its usefulness in categorizing and keeping track of large scholarly output (Pardo-Jaramillo et al., 2020). As a result, this study aims to review existing research on organizational resilience and sustainability using bibliometric analysis, a quantitative and statistical technique that generates patterns of article distribution over time and space (Martí-Parreño et al., 2016). Another objective of this study is to gain a better understanding of the relationship between the variables of organizational resilience and sustainability and how this quality affects the enduring viability of organizations that rely on teamwork

and communication across time zones. In reviewing established literature sources, there is an urgent need to investigate the most recent developments in the field of resilience and sustainability research; this is crucial because the rapid development in organizational resilience and sustainability research may have been underestimated. However, in conjunction with a comprehensive literature review, only a small number of bibliometric studies have been conducted on resilience and sustainability research (Corrales-Estrada et al., 2021; Lopez & Castro, 2021). Nevertheless, to the researcher's knowledge, there is no bibliometric study that addresses organizational resilience and sustainability. By examining the following research questions, this paper aims to fill the gap:

- RQ1: What is the current publishing trend and impact on organizational resilience and sustainability?
- RQ2: Which nations, institutions, and authors have impacted organizational sustainability and resilience?
- RQ3: What is the literature's most influential organizational resilience and sustainability article(s)?
- RQ4: What are the most common organizational resilience and sustainability themes?
- RQ5: What are the potential future research directions?

The findings are presented in four sections, each of which addresses a specific feature of the study process or its results and attempts to answer the research questions. The overall goal of the study was to learn more about the concept of organizational sustainability and resilience, which is becoming increasingly important around the world. By analyzing the content of articles in the Scopus database related to organizational resilience and sustainability, this study will also help researchers to make recommendations for future studies.

Following this introduction, Section 2 provides a literature review of bibliometric analysis and previous research on organizational resilience and sustainability; Section 3 describes the technique employed in this bibliometric study; Section 4 presents the findings of the study; Section 5 provides an overview of the report; and Section 6 addresses the shortcomings of the study and possible avenues for future research.

LITERATURE REVIEW

Bibliometric Analysis

Martí-Parreño et al. (2016) define bibliometrics as the quantitative and statistical study of how different topics and time periods are treated in published literature. Research on a specific topic can be analyzed through a bibliographic study and its trends and patterns can be presented (Sweileh et al., 2017). Nowadays, bibliometric analysis is commonly used to show how a study has influenced the field and how it has changed over time (Sweileh et al., 2017). Indicators such as type of publication, citation frequency, authorship, influence of the work, and geographic location are often used in bibliometric studies (Sweileh, 2020). Valérie and Pierre (2010) posit that bibliometric indicators can be divided into three categories: quantity, quality, and structure. The success of a researcher's work can be measured by metrics such as the total number of citations, the researcher's h or g index, and the citation value. The impact per publications (IPP) and impact factor (IF) are additional measures of research quality (Ahmi & Mohd Nasir, 2019). Links between publications, authors, and different disciplines are examples of structural indicators. Co-authorship, co-citations, and bibliographic linking are other ways to track this indicator (van Eck & Waltman, 2018)

Past Studies

The rapid progress in research on organizational resilience and sustainability may have been overestimated; therefore, studies on resilience and sustainability need to be analyzed for current trends using standard literature citation indices. Some bibliometric studies of resilience and sustainability research have been conducted in the past, but in conjunction with a systematic review of the literature (Corrales-Estrada et al., 2021; Lopez & Castro, 2021). The literature has shown that no unified bibliometric analysis has been conducted to comprehensively examine and map the work on organizational resilience and sustainability. Given the increasing need to classify and make sense of the enormous volume of scholarly output, the use of bibliometric studies has proliferated in academia (Pardo-Jaramillo et al., 2020).

METHODS

In this bibliometric study, articles titled “organizational resilience OR organizational sustainability” were extracted from the Scopus database. All articles in Scopus from 1998 to October 2022 were analyzed in this study. Scopus is a comprehensive multidisciplinary database of references and abstracts from scholarly journals, trade magazines, books, patent databases, and conference proceedings. Tracking, analyzing, and visualizing search data are all possible with the help of this suite of tools. Scopus now has over 39,743 titles, including 25,000 currently available titles and 14,558 that have been removed from the database (mainly older versions). Such a database can serve as a clear summary of scientific work. Therefore, the Scopus database has become an indispensable resource for researchers worldwide. As of October 2022, bibliometric analysis has been conducted using the Scopus database. It has presented not only the objective of the research but also the relevant subject matter that is of value to the investigated domain. Articles published in any language that were relevant to the research on organisational resilience and organisational sustainability were identified using the search term “organisational resilience OR organisational sustainability” in the article title. The titles of the articles were the first thing that the readers encountered (Annesley, 2010; Jamali & Nikzad, 2011).

Information Extraction

The search approach is displayed in Figure 1. The bibliometric study was performed on every one of the documents. The following methodology was utilized in this study:

- The frequency and proportion of each publication were computed with the help of Microsoft Excel 2019, and appropriate graphical representations were made using the application;
- VOSviewer (version 1.6.16.0) was used to construct and visualize the bibliometric relationships;
- The metrics for citations were calculated using the Publish and Perish tool by Harzing.

Figure 1

Search Strategy Diagram

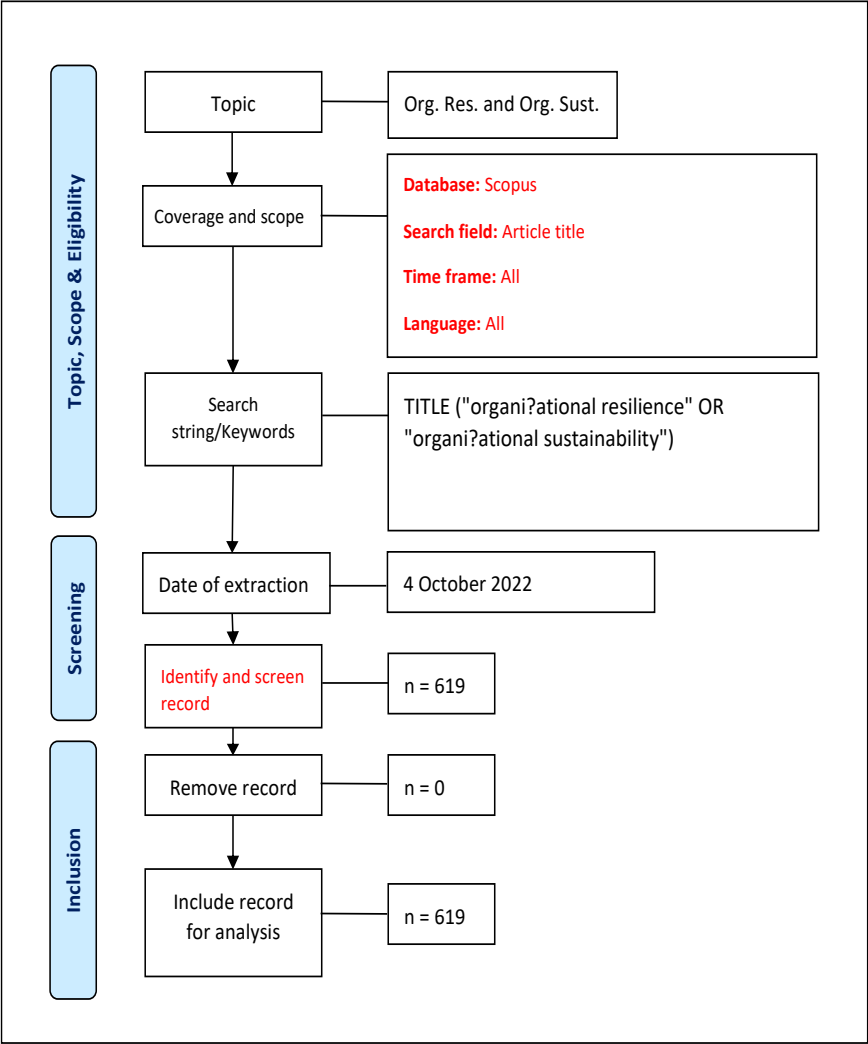
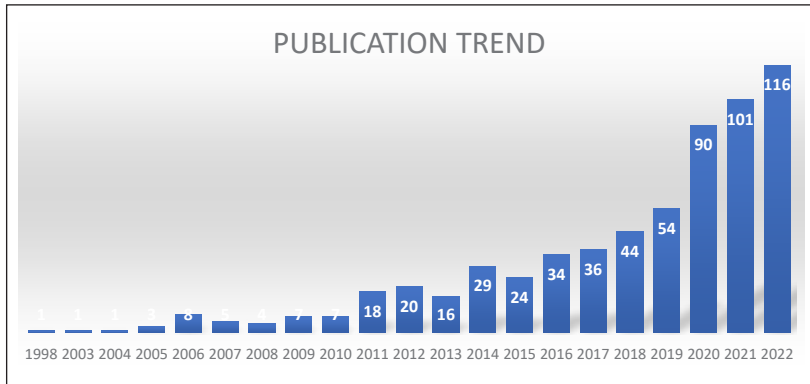


Figure 2

Total Publications and Citations by Year



RESULTS

This section presents the results of the bibliometric analysis conducted to answer the study questions. This research was conducted to respond to concerns about the nature of recent developments in organizational resilience and sustainability and their significance. The second objective is to identify the leading nations, academic institutions, and researchers in the field of organizational resilience and sustainability research; the third objective is to find the most cited papers. The first step in illustrating recent trends is a discussion of annual expansion, showing the trend and influence of publications in the field of organizational resilience and sustainability. Academic papers extracted from the search were analyzed using a variety of metrics, including annual publication trend, document type and source, publication languages, subject area, keyword analysis, publication keywords, country publication trends, authorship analysis, and citation analysis. Results also included annual growth data, both in frequency and percentage, from 1998 to October 2022. Articles used were broken down by year, country, article, author, and affiliation to assess publication patterns in the field of organizational resilience and sustainability, with the goal of securing a better understanding of current trends and the impact of research in this area. The results of this study were analyzed using bibliographic information from Scopus.

Annual Growth of Publication

According to the Scopus database, the first study on organizational resilience and sustainability was published in 1998 by Mallak (1998). The annual number of articles published on organizational resilience and sustainability is summarized in Table 1 from 1998 to 2022. The table shows that in 2022, 116 articles accounted for 18.74% of all publications. Data on the number of organizational resilience and sustainability articles available each year can be found in Table 1. Articles published in 2011 received the most citations (a total of 1,360 or an average of 75.56), while articles published in 2005 received the fewest citations (a total of 32). In 2004, there was only one publication. Consequently, there were also no citations. However, the prevalence of organizational resilience and sustainability building initiatives has increased since 2005. (Figure 2).

Table 1

Year of Publication

Year	TP	NCP	TC	C/P	C/CP	h	g
1998	1	1	158	158.00	158.00	1	1
2003	1	1	103	103.00	103.00	1	1
2004	1	0	0	0.00	#DIV/0!	0	0
2005	3	2	32	10.67	16.00	1	2
2006	8	5	345	43.13	69.00	4	5
2007	5	5	414	82.80	82.80	5	5
2008	4	4	261	65.25	65.25	2	4
2009	7	6	159	22.71	26.50	5	6
2010	7	6	307	43.86	51.17	5	6
2011	18	14	1360	75.56	97.14	10	14
2012	20	19	781	39.05	41.11	11	19
2013	16	13	298	18.63	22.92	6	13
2014	29	22	750	25.86	34.09	11	22
2015	24	19	575	23.96	30.26	9	19
2016	34	32	903	26.56	28.22	12	30
2017	36	29	659	18.31	22.72	13	25
2018	44	41	865	19.66	21.10	17	28

(continued)

Year	TP	NCP	TC	C/P	C/CP	h	g
2019	54	40	712	13.19	17.80	14	26
2020	90	69	1066	11.84	15.45	17	30
2021	101	63	557	5.51	8.84	13	21
2022	116	41	123	1.06	3.00	6	7

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

Types of Documents and Sources

Depending on its credibility, a given document may be classified as a “conference paper,” “article,” “book chapter,” and so on. On the other hand, the type of source indicates the type of origin of the document, e.g., “journal,” “conference proceedings,” “book series,” “book,” or “professional publication”. There is a possibility that the document format of the conference paper may be different from that of the original paper (Sweileh et al., 2017). For example, a conference paper would be classified as a “conference paper” in the list of document types. Different versions of the same paper may be labeled as different sources depending on where they were originally published. Table 2 provides an overview of the ten document categories that are most common in the literature on organizational resilience and sustainability. The data in the table shows that articles account for 65.43 percent of all publications, followed by conference papers at 12.92 percent and book chapters at 10.66 percent. At the same time, less than 6% of all publications are other types of documents.

Table 2

Types of Documents

Document type	Total no. of publications (TP)	Percentage (%)
Article	405	65.43%
Conference paper	80	12.92%
Book chapter	66	10.66%
Review	33	5.33%
Book	10	1.62%
Editorial	7	1.13%
Note	7	1.13%

(continued)

Document type	Total no. of publications (TP)	Percentage (%)
Letter	6	0.97%
Erratum	4	0.65%
Conference review	1	0.16%
Total	619	100.00

The documents used in this study were assigned to four different primary sources, with journals accounting for the largest proportion (463 documents; 74.80%) and conference proceedings in second place (66 documents; 10.66%). Books contribute significantly to the total number of publications with 10.18% (63 documents) and book series with 4.36% (27 documents) as shown in the following Table 3.

Table 3

Source Type

Source type	Total no. of publications (TP)	Percentage (%)
Journal	463	74.80%
Conference proceeding	66	10.66%
Book	63	10.18%
Book series	27	4.36%
Total	619	100.00

Document Language

Table 4 shows that most journals were published in English, as evidenced by the fact that 601 publications accounted for 96.94% of the total number of publications. Only a few of the published documents were written in more than one language, including Spanish, Portuguese, German, Persian, Chinese, French, Italian, Russian, and Turkish. These documents represent the smallest percentage of the total published documents.

Table 4

Languages

Language	Total no. of Publications (TP)	Percentage (%)
English	600	96.94%
Spanish	6	0.97%
Portuguese	4	0.65%
German	2	0.32%
Persian	2	0.32%
Chinese	1	0.16%
French	1	0.16%
Italian	1	0.16%
Russian	1	0.16%
Turkish	1	0.16%
Total	619	100.00

Topic Areas

Using (a) subject areas and (b) author keywords, this finding analyzes the various facets of research on organizational resilience and sustainability. This result also provides a partial answer to the research question (RQ) posed, that examined the topic of organizational resilience and sustainability.

Subject Area

In this analysis, documents were sorted by the topics covered in particular publications in which they were first published (Table 5). The data shows that there is a wide range of studies on organizational resilience and sustainability. A total of 299 articles were published in the economic, management, and accounting section (48.30%), 206 articles in the social sciences section (33.28), 131 articles in the engineering section (21.16), and 106 articles in the environmental science section (17.12%). It also shows that journals from fields as diverse as economics, econometrics, finance, computer science, medicine, energy, decision sciences, psychology, and other fields have published studies on organizational resilience and sustainability.

Table 5

Subject Area

Subject area	Total no. of publications (TP)	Percentage (%)
Agricultural and Biological Sciences	10	1.62%
Arts and Humanities	17	2.75%
Business, Management, and Accounting	299	48.30%
Chemical Engineering	4	0.65%
Chemistry	1	0.16%
Computer Science	69	11.15%
Decision Sciences	59	9.53%
Earth and Planetary Sciences	8	1.29%
Economics, Econometrics, and Finance	86	13.89%
Energy	62	10.02%
Engineering	131	21.16%
Environmental Science	106	17.12%
Health Professions	10	1.62%
Materials Science	4	0.65%
Mathematics	14	2.26%
Medicine	63	10.18%
Multidisciplinary	4	0.65%
Nursing	9	1.45%
Pharmacology, Toxicology, and Pharmaceutics	2	0.32%
Psychology	31	5.01%
Social Sciences	206	33.28%

The top countries, universities, and scholars in the field of organizational resilience and sustainability studies were analysed after considering the current trend and the influence of publications in this field. To answer the second question of the study, the publications were categorized according to their respective countries.

Publications by Countries

This section examines the current state of collaboration and identifies the most crucial nation for organizational resilience and sustainability.

Scopus is a database that contains articles from researchers in 76 countries, all related to organizational resilience and sustainability. The leading nations that have contributed to studies on organizational resilience and sustainability are listed in Table 6. Overall, the United States of America tops the list with 109 publications, the United Kingdom is second with a total of 63 publications, China is third with a total of 46 publications, and Australia is fourth with a total of (42). While the United States ranked first with 3,049 citations, the United Kingdom ranked second with 1,642 citations, Australia ranked third with 851 citations, and Canada ranked fourth with 772 citations. Having determined the total number of papers produced in each country, the researchers analyzed authorship to answer the second research question.

Table 6

Top 20 Countries with the Highest Number of Documents

Country	TP	NCP	TC	C/P	C/CP	H
United States	109	89	3049	27.97	34.26	22
United Kingdom	63	50	1642	26.06	32.84	20
China	46	22	369	8.02	16.77	10
Australia	42	30	851	20.26	28.37	12
Germany	32	20	519	16.22	25.95	11
India	31	21	144	4.65	6.86	7
New Zealand	29	25	706	24.34	28.24	12
Canada	26	22	772	29.69	35.09	11
Malaysia	25	16	141	5.64	8.81	7
Brazil	22	14	384	17.45	27.43	7
Italy	21	15	497	23.67	33.13	8
Spain	18	14	434	24.11	31.00	7
France	16	10	44	2.75	4.40	4
South Africa	15	11	224	14.93	20.36	4
Sweden	15	12	393	26.20	32.75	9
Turkey	14	10	268	19.14	26.80	6
Netherlands	13	11	214	16.46	19.45	7
Pakistan	11	9	134	12.18	14.89	6
Portugal	11	8	65	5.91	8.13	4
Colombia	10	6	22	2.20	3.67	4

Analysis of Authorship

The primary focus here is to evaluate the current state of collaboration, identify the most influential authors on organizational resilience and sustainability, and identify the leading authors on organizational resilience and sustainability. Table 7 lists the most cited authors who have contributed with at least four publications on organizational resilience and sustainability. Prayag, G., Seville, E., Vargo, J., Chang, V., and Aleksić, A. are the authors who have had the greatest impact on organizational resilience and sustainability. Accordingly, Seville, E. and Vargo, J. ranked first with 358 citations each, followed by Prayag G. (264) and Aleksić, A. (137). A total of 21 authors with diverse backgrounds contributed to the total of 619 articles. Table 8 shows the number of articles written by the authors with the highest number of published works. According to the data in the table, only 7.06% of the articles have only one author, while the remaining papers have multiple authors. Often, two (19.72%) or three (28.00%) authors are involved in organizational resilience and sustainability research. In addition, the highest number of authors who have worked on organizational resilience and sustainability is 14.

To perform a multi-author analysis, VOSviewer was used in this study. The analysis used a point count based on influential authors being mentioned more than four times. The colour of the line, the diameter of the circle, the size of the font, and the strength of the font indicate the author's relationship. Authors who have a relationship are often categorized together, indicated by the same colour scheme. Figure 5 also shows a team of authors (in blue) working together.

The author's home country/region is shown as a network in Figure 6. Only nations with at least three articles mentioned and five citations are included in the study. From the results of this study, the United States plays a significant role in global research collaboration. The United States works closely with Colombia, Ireland, and Thailand. Similarly, the United Kingdom collaborates with Austria, Germany, Greece, and Iran, while China collaborates with Egypt, Hong Kong, Italy, Pakistan, and Saudi Arabia.

Table 7

Most Prolific Authors

Author's name	Affiliation	Country	TP	NCP	TC	C/P	C/CP	H	g
Prayag et al.,	University of Canterbury	New Zealand	8	7	264	33.00	37.71	5	7
Seville, E.	Resilient Organizations, Christchurch	New Zealand	6	6	358	59.67	59.67	5	6
Vargo, J.	Unit 2, Resilient Organizations Ltd., Auckland	New Zealand	6	6	358	59.67	59.67	5	6
Chang, V.	Aston University, Birmingham	United Kingdom	5	3	115	23.00	38.33	3	3
Aleksić et al.,	University of Kragujevac	Serbia	4	4	137	34.25	34.25	4	4

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

Table 8

Number of Authors per Document

Author count	Total no. of publications (TP)	Percentage (%)
1	121	7.06%
2	338	19.72%
3	480	28.00%
4	388	22.64%
5	200	11.67%
6	78	4.55%
7	49	2.86%
8	24	1.40%
9	9	0.53%
13	13	0.76%
14	14	0.81%
Total	1714	100.00%

Influential Affiliations

This section examines the state of collaboration and presents the most prominent institutions engaged in research on organizational resilience

and sustainability. Universiti Teknologi MARA has overtaken Universidade Federal de Santa Catarina and Technische Universität Dresden to become the second highest ranked university. At least five papers demonstrate the institution's involvement in organizational resilience and sustainability research. The University of Canterbury has more publications on organizational resilience and sustainability, as seen in Table 9 as follows.

Table 9

Most Influential Institutions with A Minimum of Five Publications

Affiliation	Country	TP	NCP	TC	C/P	C/CP	H	g
University of Canterbury	New Zealand	18	15	591	32.83	39.40	9	15
Universiti Teknologi MARA	Malaysia	8	6	30	3.75	5.00	3	5
Universidade Federal de Santa Catarina	Brazil	7	4	21	3.00	5.25	3	4
Technische Universität Dresden	Germany	7	6	352	50.29	58.67	5	6
The University of Queensland	Australia	6	5	501	83.50	100.20	5	5
The University of Auckland	New Zealand	5	5	53	10.60	10.60	3	5
Carleton University	Canada	5	5	39	7.80	7.80	4	5
Universiti Teknologi Malaysia	Malaysia	5	3	56	11.20	18.67	2	3
University of Technology Sydney	Australia	5	4	32	6.40	8.00	3	4
Sapienza Università di Roma	Italy	5	5	256	51.20	51.20	4	5
University of Kragujevac	Serbia	5	5	147	29.40	29.40	5	5

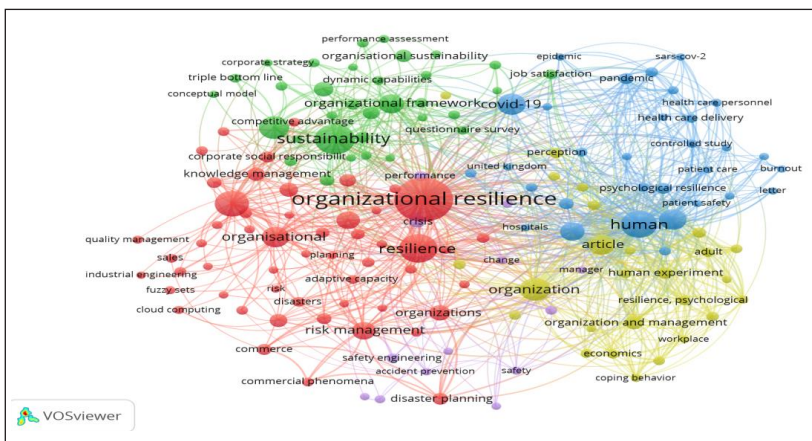
Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

Analysis of Keywords

The premise on which keyword analysis is based is that the author's choice of keywords should accurately reflect the topic of the article (Comerio & Strozzi, 2019). The co-occurrence of two or more keywords in an article indicates that the terms are related. The researchers employed the keyword and co-occurrence analysis of the VOSviewer software to answer the last question of the study. The authors used VOSviewer, a program for building and displaying a bibliometric network and analyzing keywords, to identify the words that appear in each publication (Figure 3). Figure 4 displays a map of the authors' keywords created by VOSviewer, highlighting the strength of the association between keywords using colour, circle size, font, and line thickness. Similar keywords are frequently given the same colour. Likewise, after eliminating the primary keywords of the search query (i.e., organizational resilience and sustainability). The most frequently occurring keywords are sustainable development, organization, leadership, learning, risk management, innovation, decision making, crisis management, pandemic, Covid-19, organization and management, and corporate social responsibility, and psychological resilience (Table 10).

Figure 3

Network Visualization Map of Author Keywords



After completing the keyword analysis, a citation analysis was performed to gain a deeper understanding of the predominant themes.

Table 10

Top 30 Keywords

Author keyword	Total no. of publications (TP)	Percentage (%)
Organizational resilience	175	28.27%
Sustainability	80	12.92%
Resilience	76	12.28%
Human	64	10.34%
Sustainable development	60	9.69%
Organization	49	7.92%
Organizational sustainability	47	7.59%
COVID-19	40	6.46%
Organizational	39	6.30%
Humans	37	5.98%
Organizational framework	34	5.49%
Leadership	30	4.85%
Risk management	28	4.52%
Organizations	22	3.55%
Innovation	21	3.39%
Decision making	18	2.91%
Organization and management	18	2.91%
Knowledge management	16	2.58%
Societies and institutions	16	2.58%
Crisis management	15	2.42%
Crisis	14	2.26%
Disaster planning	13	2.10%
Business	12	1.94%
Human experiment	12	1.94%
Pandemic	12	1.94%
Risk assessment	12	1.94%
Corporate social responsibility	11	1.78%
Learning	11	1.78%
Psychological resilience	11	1.78%
Perception	10	1.62%

Analysis of Citations

While there are numerous approaches to assessing the significance of scholarly works, citation analysis has become the norm (Ding &

Cronin, 2011). The following Table 11 and Figure 4 provide a brief description of the citation metrics for t texts collected as of October 4, 2022. According to the table of citation metrics, there were 10,428 citations for 619 published articles over a period of 24 years (1998–2022), with an average of 434.5 citations per year. The fourth research question, “Which article in organizational resilience and sustainability research is most important?” is addressed in this section of the study, which aims to find the dominant article in the field of organizational resilience and sustainability. Using the number of citations in each article, the researchers analyzed a total of 619 articles to find the answer to question 4. The most frequently cited articles from the Scopus database are listed in Table 12. Lengnick-Hall et al. (2011) ranked first with a total of 599 citations and an annualized rate of 54.45 citations for the article “Developing a capacity for organizational resilience through strategic human resource management.”

Table 11

Citation Metrics

Metric	Data
Papers	619
Citations	10428
Years	24
Cites per year	434.5
Cites per paper	16.85
Cites per author	4827.9
Papers per author	294.93
Authors per paper	2.76
h. index	50

Figure 4

Citation Metrics

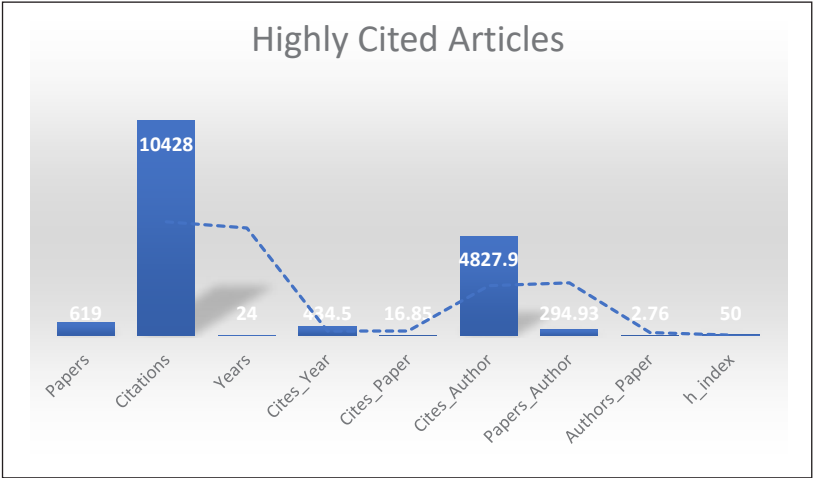


Table 12

Top 20 Highly Cited Articles

No.	Author	Title	Year	TC	Citations per Year
1	Lengnick-Hall et al.	Developing a capacity for organizational resilience through strategic human resource management	2011	599	54.45
2	Gittell et al.	Relationships, layoffs, and organizational resilience: Airline industry responses to September 11	2006	110	19.38
3	Vogus & Sutcliffe	Organizational resilience: Towards a theory and research agenda	2007	294	19.6
4	Ortiz-de-Mandojana & Bansal	The long-term benefits of organizational resilience through sustainable business practices	2016	290	48.33

(continued)

No.	Author	Title	Year	TC	Citations per Year
5	McManus et al.	Facilitated process for improving organizational resilience	2008	208	14.86
6	Pal et al.	Antecedents of organizational resilience in economic crises - An empirical study of Swedish textile and clothing SMEs	2014	201	25.13
7	Linnenluecke et al.	Extreme weather events and the critical importance of anticipatory adaptation and organizational resilience in responding to impacts	2012	181	18.1
8	Sahebjamnia et al.	Integrated business continuity and disaster recovery planning: Towards organizational resilience	2015	175	25
9	Duchek	Organizational resilience: A capability-based conceptualization	2020	175	87.5
10	Mallak	Putting organizational resilience to work	1998	158	6.58
11	Lopes et al.	An analysis of the interplay between organizational sustainability, knowledge management, and open innovation	2017	145	29
12	Barasa et al.	What is resilience, and how can it be nurtured? A systematic review of the empirical literature on organizational resilience	2018	133	33.25
13	Braccini & Margherita	Exploring organizational sustainability of Industry 4.0 under the triple bottom line: The case of a manufacturing company	2019	119	39.67
14	Crichton et al.	Enhancing organizational resilience through emergency planning: Learnings from cross-sectoral lessons	2009	113	8.69

(continued)

No.	Author	Title	Year	TC	Citations per Year
15	Rioli & Savicki	Information system organizational resilience	2003	103	5.42
16	Moizer & Tracey	Strategy making in social enterprise: The role of resource allocation and its effects on organizational sustainability	2010	93	7.75
17	Florea et al.	For all good reasons: Role of values in organizational sustainability	2013	90	10
18	Fietz et al.	Organizational resilience: A valuable construct for management research?	2021	82	82
19	Ferris et al.	It takes two to tango: Personal and organizational resilience as predictors of strain and cardiovascular disease risk in a work sample	2005	31	1.82
20	Do et al.	Building organizational resilience and innovation through resource-based management initiatives, organizational learning, and environmental dynamism	2022	11	11

Documents Based on Source Title

Numerous academic publications, conferences, and books have published articles based on studies of organizational resilience and sustainability. Looking at the total number of publications published using each source, Table 13 shows which source is most active when it comes to publications on organizational resilience and sustainability. As can be seen from the table, “Sustainability Switzerland” is the authoritative source for organizational resilience and sustainability.

Table 13*Most Active Source Titles*

Source Title	TP	TC	Publisher	Cite Score	SJR 2019	SNIP 2019
Sustainability Switzerland	40	695	MDPI	5	0.664	1.31
Journal of Business Continuity Emergency Planning	11	34	Henry Stewart Publications	0.7	0.178	-1
Australian Journal of Emergency Management	7	160	Australian Institute for Disaster Resilience	0.7	0.219	0.448
Journal of Cleaner Production	7	338	Elsevier	15.8	1.921	2.444
International Journal of Environmental Research and Public Health	5	86	MDPI	4.5	0.814	1.44
International Journal of Organizational Analysis	5	53	Emerald	3.2	0.495	0.933
Journal of Management and Organization	5	152	Cambridge University Press	5.1	0.64	1.05
Research Handbook on Organizational Resilience	5	12	Edward Elgar Publishing Ltd.	N/A	N/A	N/A
Safety Science	5	77	Elsevier	10.1	2.297	1.438
Advances in Intelligent Systems and Computing	4	3	Springer Nature	0.9	0.215	0.307

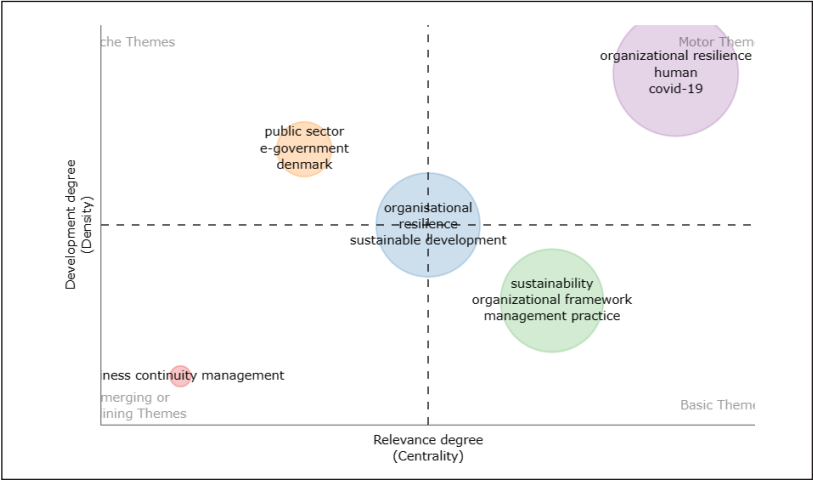
Thematic Analyses

Density and centralization are used to create a theme map with four different topological zones (Fig. 7). This figure shows the study themes that emerge from the conceptual framework of the articles included in the bibliometric analysis. The larger the cluster, the more frequent the keywords it contains, which represent the overarching themes that emerged from the analysis. This finding is the result of a semi-automatic system that examined the titles of all analyzed references, as well as additional relevant keywords (beyond the author's keywords) to capture deeper variations. Niche themes, which are specific and underrepresented topics in the studied area, are shown in the upper left quadrant. These themes, such as "public sector" and "e-government," are experiencing rapid development, as evidenced by high density but low centrality. Among the niche subjects discussed, was on e-governance and its connection to the public sector as a source of resilience and sustainable development. To better adapt to a changing environment, organizations should use digitization or e-governance to strengthen their resilience (Hadjielias & Christofi, 2022). Emergent and receding themes, on the other hand, are found in the lower left quadrant and include previously used but more underdeveloped and peripheral themes. Due to its low centrality and density, "business continuity management" seems to be fading; on the other hand, "sustainable development" and "resilience" seem to be growing themes, as well as distinctions from "resilience" that are becoming more common (Faruk et al., 2021; Fomina et al., 2022; Mühl & de Oliveira, 2022). Considering these findings, organizations, particularly in the public sector, can change their strategic plan while remaining protected from any potential disaster.

Similarly, the high density and centrality associated with the motor or driving themes are highlighted in the upper right quadrant, while the high centrality but low density associated with the basic themes come to light in the lower right quadrant. The themes in the upper right quadrant—"organizational resilience," "human," and "Covid-19"—are important to the future of this field of study and therefore deserve further development. Finally, the topics of "sustainability," "organizational framework," "management practice," a subset of the theme, "resilience", and a portion of the theme, "sustainable development" are all found in the lower right quadrant, where there is high centrality but low density, indicating their importance to research as general topics.

Figure 7

Thematic Map of Five Clusters Based on Density and Centrality



Source: Scopus/Biblioshiny

Figure 8, which is termed as Sankey diagram, confirms the above thematic and cluster analysis, as well as the cluster rankings shown in Table 14. The most common colours in each cluster represent the type of content that belongs to that cluster. Over time, the connections between many themes have also changed. Some themes have grown and changed steadily over time, while others have emerged more recently and now dominate the discussion (Schmidt, 2008).

Table 13

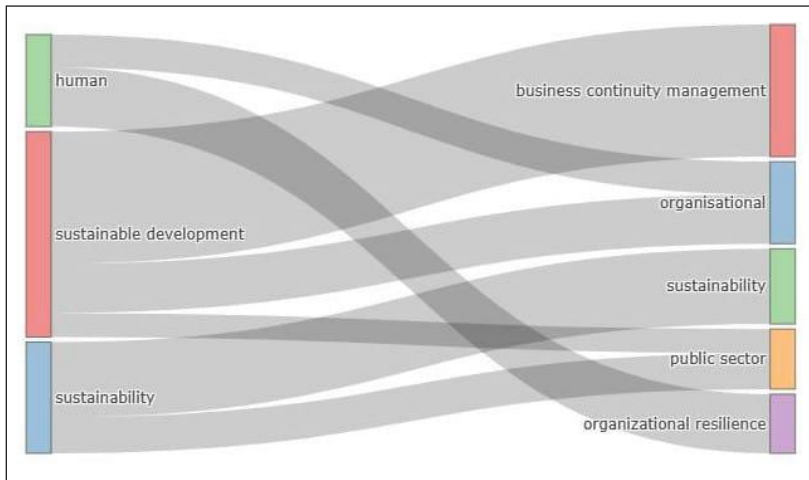
Most Active Source Titles

Cluster	Callon centrality	Callon density	Rank centrality	Rank density	Cluster frequency
Business continuity management	0.5	50	1	1	2
Organizational	6.1	87.7	3	3	129
Sustainability	6.5	80.9	4	2	123
Organizational resilience	8.4	126	5	5	375
Public sector	0.9	115	2	4	11

Moreover, the focus of the research was not fixed, but evolved over time. The constant interest in researching “sustainable development” and “business continuity management” over time is represented by the colour, red. Accordingly, research on “human” and “organizational resilience” have also gained importance, followed by “sustainable development” and “organizations”. Moreover, it can be concluded that the previously discussed research topics have the potential to develop further in the coming years.

Figure 8

Thematic Evolution



Source: Scopus/Biblioshiny

DISCUSSION

Given the constant dynamism and change in the environment (Liang & Cao, 2021; Seo et al., 2020), it is essential to strengthen the resilience of organizations to improve sustainability. Although the topic of sustainability has been a focus of scholarly attention for several years (González-Serrano et al., 2020), while scholars have recognized the importance of resilience as a factor in improving the long-term sustainability of organizations, little research has been done on how sustainability and resilience can be combined to reduce the impact of negative events. This bibliometric analysis highlights the

important role that the above strategic concepts have in creating and implementing a new model for companies. Consequently, the main aspect of the research focused on recent developments in the field of organizational resilience and sustainability. Thus, bibliometric analysis was used to study the development of scholarship on resilient and sustainable organizations and to assess the extent of research and publication efforts in a particular scholarly field (Moed et al., 2001). According to Gu (2004), bibliometric information can be used to assess the state of a discipline, guide the implementation of institutional policies for the distribution of funding, and facilitate an investigation of the similarities and differences between scientific contributions and results. Similarly, the results of a bibliometric study can provide insight into the causes of a field's substantial research contributions and point future researchers in the direction of fruitful research avenues (Akhavan et al., 2016).

RQ1: What is the current publishing trend and impact on organizational resilience and sustainability?

This study focuses on articles collected by Scopus on organizational resilience and sustainability. The researchers in this study utilized a specific search query to retrieve 619 records from a specified data source. The small number of publications found on this subject is indicative of the relatively limited amount of research that has been conducted in the said areas. The materials collected in the Scopus database indicate that the study of organizational resilience and sustainability was initiated by (Mallak, 1998) under the title, "Putting organizational resilience to work". Publications gradually increased until 2005. Since then, the number of articles addressing organizational resilience and sustainability has increased. Over 65 percent of the documents are articles on organizational resilience and sustainability, which is disproportionately high compared to other publications. However, most of the publications are in English and come from 76 nations.

RQ2: Which nations, institutions, and authors have impacted organizational sustainability and resilience?

Countries with the most contribution to the literature on organizational resilience and sustainability include the United States and the United Kingdom, with a total of 109 and 63 publications, respectively (Table 6). This means that these studies are more likely to be conducted in

Western or developed countries, creating a gap in developing countries. Business, management, and accounting (299; 48.30%), social sciences (206; 33.28%), engineering (131; 21.16%), and environmental science (106; 17.12%) are the most common disciplines in which studies on organizational resilience and sustainability are published. However, the most prominent institution dedicated to the study of organizational resilience and sustainability is the University of Canterbury, New Zealand, with a total of 18 publications and about 591 citations on organizational resilience and sustainability, followed by Universiti Teknologi MARA (UiTM), Malaysia, with 8 publications, surpassing Universidade Federal de Santa Catarina, Brazil, and Technische Universität Dresden, Germany, with 7 publications each, making UiTM the second highest ranked university. At least five publications demonstrate the college's involvement in organizational resilience and sustainability research, as seen in Table 9.

Citation matrices were used to answer the meaning of publications on organizational resilience and sustainability. Analysis of citation metrics provides insight into the relevance of publications on organizational resilience and sustainability. The field has experienced significant growth over the past two decades, with 619 articles published and more than 10,428 citations in 2022. Scopus data on organizational resilience and sustainability were cited with an average of 434.5 times per year, with 16.85 citations per article and 2.76 authors. Table 7 lists the most cited authors who contributed at least four publications on organizational resilience and sustainability. Prayag, G., Seville, E., Vargo, J., Chang, V., and Aleksić, A., are authors who have had the greatest impact on organizational resilience and sustainability. Accordingly, Seville, E. and Vargo, J. ranked first with 358 citations each, followed by Prayag G. (264) and Aleksić, A. (137).

RQ3: What is the literature's most influential organizational resilience and sustainability article(s)?

Numerous academic publications, conferences, and books have published articles based on studies of organizational resilience and sustainability. However, when looking at the total number of publications using each source, Sustainability Switzerland (MDPI) and the Journal of Cleaner Production received the most citations per published article, followed by the Australian Journal of Emergency Management and the Journal of Management and Organization. These

journals also tend to be the most productive in terms of scholarly research. Table 13 shows which journal is most active in publishing on organizational resilience and sustainability. As can be seen from the table, Sustainability Switzerland is the most authoritative source on organizational resilience and sustainability. Furthermore, this is a useful resource for academics and professionals in the field.

RQ4: What are the most common organizational resilience and sustainability themes?

Five main clusters were found on organizational resilience and sustainability (Business Continuity Management, Organizational, Sustainability, Organizational Resilience and Public Sector). The most common colours in each cluster indicate the type of content that belongs to the particular cluster. As time progresses, so do the connections between many subjects. Some themes have grown and changed steadily over time, while others have emerged more recently and now dominate the discussion (Schmidt, 2008). The topics of “sustainability,” “organizational framework,” “management practice,” part of the topic of “resilience,” and part of the topic of “sustainable development” are important as general topics for research. The themes of “organizational resilience,” “human,” and “Covid-19” are both relevant and well developed for shaping this research area as such and should be advanced. This is illustrated in Figure 7. The niche themes highlight “e-governance” and are linked to the “public sector” as a driver for resilience and sustainable development. Organizations need to improve their resilience in a volatile environment by incorporating digitalization or e-governance so that they can quickly adapt to changing circumstances (Hadjielias & Christofi, 2022). As a result, the topics in the lower left quadrant are classified as emerging and disappearing themes, which include weakly developed and peripheral topics that have been used in the past but currently, show a declining trend. Due to its low centrality and density, “business continuity management” appears to be disappearing in this case; on the other hand, “sustainable development” and “resilience,” appear to be emerging themes as indicated by their centrality and density and, to some extent, the density of “resilience” (Faruk et al., 2021; Fomina et al., 2022; Mühl, 2022). This study points to a dynamic and innovative paradigm that can guide organizations, especially in the public sector, to change their strategy to become resilient to potential crises. For this reason, lately there is growing interest in sustainability

in organizational management, which has become a new area of study in recent years.

CONCLUSION

The purpose of this study was to review the literature on organizational sustainability and resilience by examining how trends and patterns are presented and analyzed in the published literature. Bibliometric analysis, a quantitative and statistical method that establishes patterns of article distribution over time and space, was used to show how a study influences the field and how it has evolved over time (Martí-Parreño et al., 2016). This study also aims to shed light on the interplay between the two concepts of organizational resilience and sustainability and how they affect the long-term success of organizations that rely on cross-time zone collaboration and communication. Based on a review of established literature sources, there is an urgent need to examine recent developments in the field. This is critical as the rapid development in this area may have been underestimated. In this way, researchers can determine whether there is a positive, neutral, or negative relationship between organizational resilience and organizational sustainability.

Limitations and Future Research

The review found that most studies in this area were conducted in Western countries, mainly in the United States and the United Kingdom (Marlow et al., 2022; Owida et al., 2022; Rai et al., 2021; Zeng et al., 2022). This also means that the results may not be transferable to other emerging and developing countries. Therefore, with reference to RQ5: What are the potential future research directions? further studies in non-Western, African, and Asian countries are needed. The thematic and cluster analyses also indicated that very few studies focus on the relationship between organizational resilience and sustainability in public organizations, as most publications are related to business continuity management in the private sector. Therefore, future studies should focus on this area. While “sustainability,” “organizational framework,” and “management practice” are important as general themes for research, “organizational resilience,” “human,” and “Covid-19,” are relevant and well developed for structuring this research field, as such should be further developed given their importance for future research, as shown in Figure 7. In the niche

themes, “e-governance” was highlighted and linked to the “public sector” as a driver for resilience and sustainable development. To better adapt to a changing landscape, organizations could use digitalization or e-governance to strengthen their resilience capabilities (Hadjielias & Christofi, 2022). Topics that have been used in the past but are currently on the decline are examples of emerging and disappearing topics located in the lower left quadrant. The low centrality and density of the term “business continuity management” suggests that it is disappearing, while the high centrality and density of the terms “sustainable development” and “resilience” suggest that they are emerging as key concepts (Faruk et al., 2021; Fomina et al., 2022; Mühl & de Oliveira, 2022). As mentioned, combining sustainability and resilience in a single model is an innovative approach that could help companies, especially in the public sector, in adapting their strategies to safeguard themselves from future crises. As a result, this emerging field of research focusing on sustainability in corporate governance has gained considerable attention in recent years.

The current investigation has made important contributions, but it is not without flaws. There is no perfect search query, so be prepared for both false positives and negative results (Sweileh et al., 2017). Scopus was the only database used in this research. Although it does not cover everything, Scopus is one of the best places to search for archival copies of scientific papers (Sweileh, 2020; Sweileh et al., 2017). Other databases such as Web of Science, Google Scholar, EBSCO, and Dimensions could be used in future searches. Remarkable developments could occur if these resources are pooled. Despite these limitations, this study makes a significant contribution to the literature by shedding light on emerging themes in studies of organizational resilience and sustainability. This research adds to the existing body of work on organizational resilience and sustainability by analyzing existing literature on this topic using bibliometrics. While there are advantages to conducting a bibliometric study, there are also limitations that must be considered in the interest of the article’s target audience and the field. Article titles are the most important factor in determining search results. In particular, “organizational resilience” and “organizational sustainability” are the two keywords. Therefore, this evaluation does not include the results of searches conducted in other areas (e.g., abstracts and keywords). The main finding was that the titles of most of the academic articles became a rallying cry. Some researchers may also be too busy to find the right search terms for their abstracts or keywords field, resulting in studies that

are only marginally related to their original questions. Before data can be analyzed, a screening process (filtering and cleaning) could be performed. Besides, there is also the possibility that they could be the subject of further studies.

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