



Sustainable Management: A Bibliometric Review of Current Trend and Development

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Abstract

With environmental issues such as global change, pollution and depletion of natural resources impacting human daily life, businesses need to learn how to mitigate, reuse and recycle to conserve our environment whilst caring about human beings and optimising benefits. Sustainable management looks above short-term quarterly profits and focuses on long-term advantages by incorporating sustainability issues into management decisions. Therefore, trends in global research on this topic is been analyzed and studied using a bibliometric review on current trend and development of 'sustainable management' over 28 years (1992-2020) on topics related to business, economics and accounting and Economics, Econometrics and Finance. By adopting bibliometric analysis, we derived data from Scopus online database as of December 13, 2020. Based on the 'keywords' search results, our study finalised 1,065 valid documents for further assessments. We utilised Harzing's Publish and Perish to analyse basic evaluations before proceeding with VOSviewer for data visualisation purposes. The findings highlight the trend of literature on 'sustainable management' since its inception in 1992 until today. The number of publications achieved 100 publications since 2018 and kept increasing each year. Most previous publications were in English, with more than 164 authors from more than 117 different countries. Using specific keywords of 'sustainable management', the results were derived based on the titles and keywords of the documents. Thus, the results of the search query for other fields such as abstracts, and different keywords are excluded. This paper offers an overview and better understanding of the current trends and development of the topic since its inception over 28 years, and also serve as a valuable reference for future research.

Keywords: sustainable management; Publish and Perish; VOSviewer; bibliometric analysis

1. Introduction

In making ethical management decisions regarding business growth and progress, today's corporate sector is gradually stressing the principle of sustainability and integrating a triangle of economic, environmental and social perspectives. As organisations across the globe confront sustainability problems, there is a rising need for leaders that are willing to integrate sustainability and profitability initiatives into their businesses to pursue benefit maximisation more holistically. With global concerns like global warming, deforestation, and loss of natural resources affecting our entire life, companies need to learn to minimise, reuse and recycle and preserve our world whilst caring for humans and optimising benefit. Sustainable management aims beyond short-term quarterly gains and reflects on long-term benefit by integrating business' environmental and social risks into management decisions.

This analysis is, therefore, very much aware of the comprehensive advancement of sustainable management in the field of research and practise that motivate us to conduct the bibliometric analysis. Therefore, this study intends to review sustainable management studies by utilising the Scopus database over the last 63 years and how this bibliometric analysis can impact future research. The following research questions will be addressed in this review:

1. What is the latest trend in sustainable management?
2. Which are the most leading articles on sustainable management?
3. Which are the most prevalent themes of sustainable management among scholars?
4. Who are the most influential authors of sustainable management?



5. What is the current state of collaboration involving sustainable management?
6. What is the intellectual structure of current research on sustainable management?

There are five key sections of the organisation of this study: Introduction, Review of Literature, Data and Methods, Results and Discussion, and Conclusion and Limitation. A detailed descriptive analysis assists the Results and Discussion section by analysing the types of documents and sources, the year of publication, the languages used in publications, the sources of publication, the geographical and institutional distribution, the subject area and the trend of the fundamental intellectual structure of the publication. Finally, we demonstrate the findings, limitations, and suggest which areas should be investigated by future researchers.

2. Literature Review

In this new century, debates on sustainability assumes a central role in the reflection on the dimensions of development and possible emerging managerial frameworks (Dubey et al., 2016) in search of world-class sustainable forms (Papadopoulos et al., 2017). Consequently, a new development strategy has emerged, embodying political, economic, social, technological, and environmental dimensions. This new paradigm of management for sustainable development implies the need for profound changes in the current production systems, human societal organization, and utilization of natural resources essential to human life and other living beings (McCormick et al., 2016; Belico et al, 2000). Dealing with the environment's complexity nowadays requires the organizations to find ways to ensure sustainability as a dynamic capability which integrates their strategies and business models. Sustainability is a competitive factor which aligned with adaptation and resilience of the organization. There is no universally accepted definition of sustainability. Most of the discussions on sustainability are focused on the triple bottom line (TBL) concept. It deals with the outcomes such as economic, social, and environmental dimensions-the latter being the hallmark of the first use of sustainable development term (Elkington, 1997). Sustainability is an agent of change to rearrange the industry characteristics (Schrettle et al., 2014). Usually research on sustainability is underlined by a static view, focusing on the initial development of social and environmental practices. Little emphasis has been given to how companies could maintain sustainability practices over time (Chakrabarty & Wang, 2012). To shift toward a new paradigm, sustainability has to be seen as a dynamic choice inside a firm, and new research has to fill this gap to understand how to maintain sustainability practices as important capabilities over time.

3. Methodology

As one of the methods used to examine the study trend (Ahmi & Mohammad, 2019), bibliometric analysis is gaining popularity. It has been commonly used in recent years in the field of Business Management and Accounting (Asiaei et al., 2020). It's an alternative to a conventional literature review. Bibliometrics is a comparative analysis of reported physical units, bibliographic units, or proxies of each (Broadus, 1987). Moreover, a methodological approach to performing a bibliometric analysis can discover more detailed publication-related data, including authors, keyword frequency and citations (Rusly et al., 2019). The bibliometric analysis could provide descriptive publishing patterns based on a domain, area, country, and period. In bibliographic research, various metrics such as publishing outlet, publishing types, authorship, affiliations, country, h-index, and g-index were among the most frequently examined aspects (Ahmi & Mohammad, 2019).

Scopus is the largest archive of scholarly works (Burnham, 2006) and the most comprehensive searchable citation and abstract search literature source (Chadegani, 2013). This database was used as the platform for extracting previous web accessibility works. The database provides details of the publication that include the type of access, year, author name, area topic, type of text, the title of the source, keyword, affiliation, country, type of source and language.

We narrowed the search of web accessibility studies based on titles to specify further critical academic works on the research domain examined. Due to a large number of studies on sustainable or sustainability, this review concentrated only on documents relevant to sustainable management based on the title of the articles (McGowan et al., 2016). As such, the following questionnaire was carried out: TITLE-ABS-KEY ("sustainable management") AND (LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "ECON")).

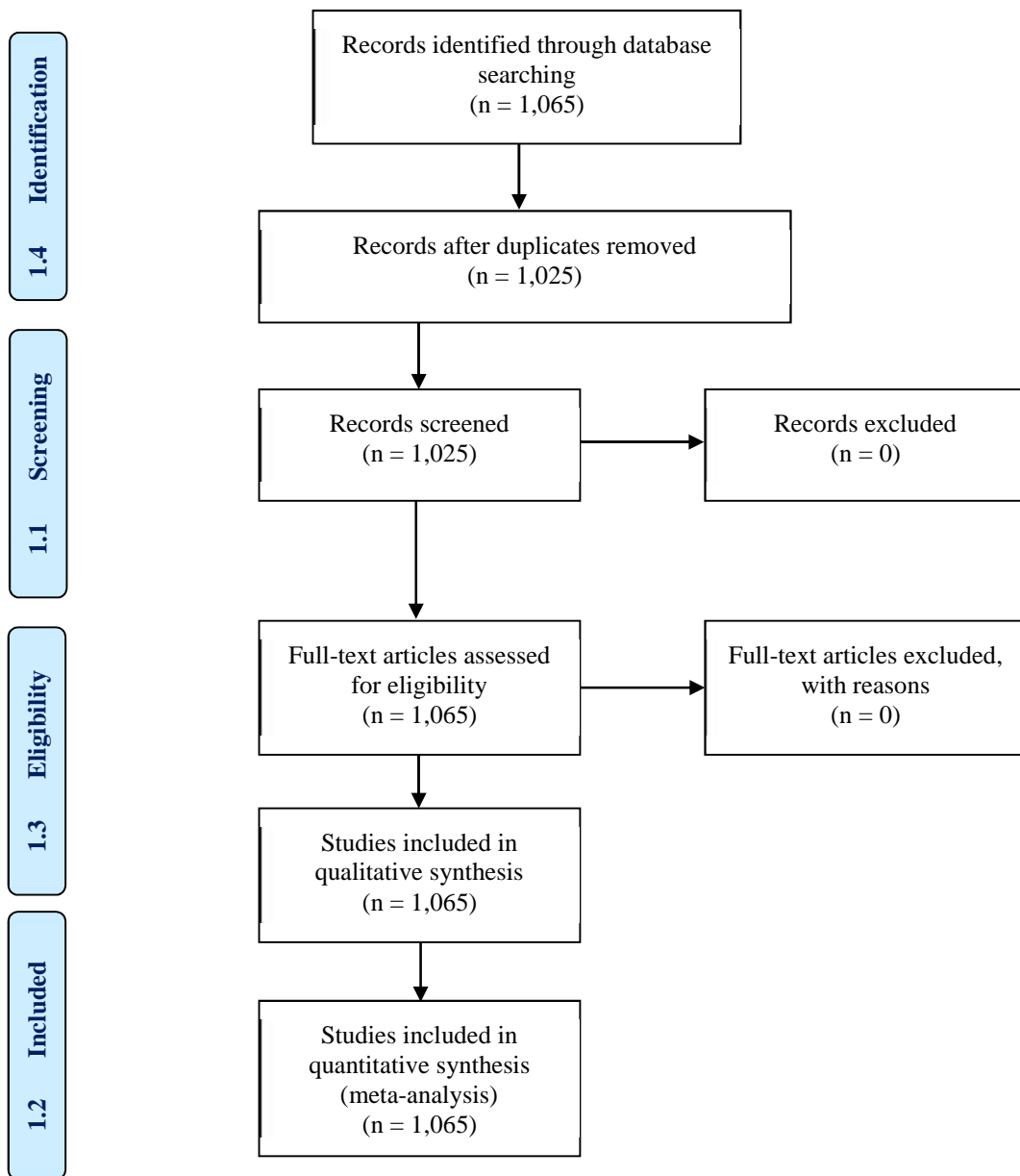


Figure 1. PRISMA Flow Diagram

Source: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(7): e1000097. doi:10.1371/journal.pmed1000097



4. Results and Discussion

The analysis of the extracted scholarly works covers document types and source types, annual growth, document language, subject area, analysis of keywords, the productivity of the country, analysis of authorship and citation. The results are interpreted in terms of frequency and percentage. Meanwhile, as some retrieved documents per year, we present the annual growth data, including their frequency, percentage and cumulative percentage until December 13, 2020. As citation metrics, we publish citation analysis and reveal 8 of the most cited authors in web accessibility.

4.1 Evolution of Publication

From the beginning of its first inception, the growth of sustainable management publications have had increased gradually, especially in 2010. Based on this momentum, we are confident that the number of publications will rise progressively in the future as more and more research will be conducted on sustainable management issues. In 2018, the number of publications hit 3-digit with 110, 136, and 151 of total publications for each year from 2018-2020. Seven publications have already been scheduled and indexed in the Scopus database in the year 2021. Sharma, N., and Rowe, R. (1992) conducted the first study on sustainable management issues in 1992 with "Managing the world's forests" published in Finance and Development article. Though the publications of topic related to sustainable management keep increasing each year, only 15 studies have been conducted of sustainable management in Malaysia. Thus, more studies need to be done on this topic especially in Sabah and Sarawak (Borneo States of Malaysia).

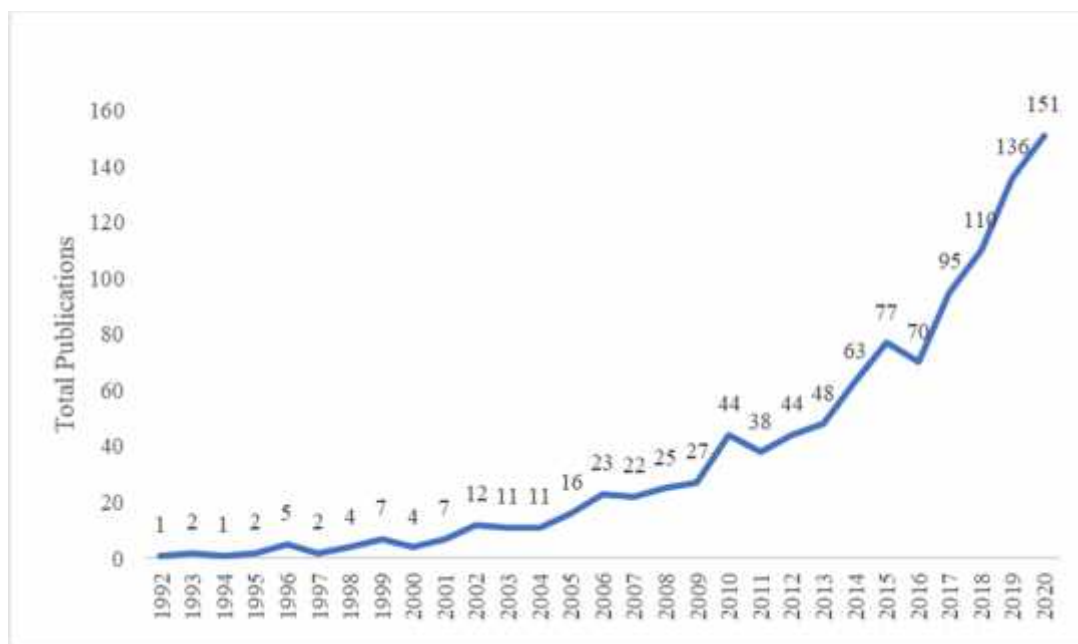


Figure 1: Sustainable Management Publications, 1992-2020 (n=1,910)

4.2 Document and Source Types

This study found 9 types of published documents related to sustainable management, namely article, book chapter, conference paper, review, book, editorial, note, short survey, and letter. As exhibits in Table 1, most publications were articles, which accounted for around 77.9%, followed by book chapter, 6.9%, and conference paper 6.7%. Collectively, other types of documents made up about 8.5%, with each type being less than 4.2% of the total documents. Furthermore, four source types are also presented in Table 1, Journals (83.8%) are the highest category, followed by book (9.2%) and conference proceedings (4.8%). The number of other documents accounted for 1.3%, 0and 0.8% respectively represents trade journal and book series. Meanwhile, only 17.3% were published in an open-access platform. The majority were published through other platforms (82.7%).



Table 1: Document, Source and Access Types

Document Type	NP	%	Source Type	NP	%	Access Type	NP	%
Article	830	77.9	Journal	893	83.8	Open Access	184	17.3
Book Chapter	73	6.9	Book	98	9.2	Other	881	82.7
Conference Paper	71	6.7	Conference Proceeding	51	4.8			
Review	45	4.2	Trade Journal	14	1.3			
Book	30	2.8	Book Series	9	0.8			
Editorial	7	0.7						
Note	4	0.4						
Short Survey	4	0.4						
Letter	1	0.1						

Note: NP = No. of Publications

4.3 Languages of Documents

Since English is the universally recognised scholarly language, almost all papers are written in English. Table 2 reveals that most of the documents obtained were published in English (94.3%). Spanish, Portuguese, German, and French accounted about 1.8%, 1.1%, 0.8%, and 0.7% respectively. Russian accounted for 0.3% while Chinese, Italian, Lithuanian, and Ukrainian accounted for 0.2% of the total publications, while other languages only accounted for 0.1%, which include Romanian and undefined.

Table 2: Languages

Language	NP	%
English	1017	94.3
Spanish	19	1.8
Portuguese	12	1.1
German	9	0.8
French	8	0.7
Russian	3	0.3
Chinese	2	0.2
Italian	2	0.2
Lithuanian	2	0.2
Ukrainian	2	0.2
Romanian	1	0.1
Undefined	1	0.1

Note: NP = No. of Publications

4.4 Subject Area

Over 28 years, the studies of sustainable management have had stretch from agricultural and biological sciences to social sciences. But for the purpose of this analysis, we were only including business, management and accounting, and economics, econometrics and finance subject area. Thus, this research also addressed written articles based on the subject areas. Majority of the sustainable management studies are in business, management and accounting (55.7 percent) and the remaining are in the subject related to economics, econometrics and finance (44.3 percent). Table 3 shows the number of publications and percentages of subject areas covered in sustainable management studies.



Table 3: Subject Area

	Subject Area	NP	%
1	Business, Management and Accounting	669	55.7
2	Economics, Econometrics and Finance	532	44.3

Note: NP = No. of Publications

4.5 Geographic Distribution of Publication and Affiliation

Researchers from 117 various countries contributed to the release of the extracted documents. Table 4 lists the Top 6 countries subscribing to sustainable management publications. A total of 1,065 publications were published as on December 13, 2020, with 152 documents were released in United States, followed by United Kingdom (100), Australia (89), China (75), Spain (69), and Germany (64). Even though the US was ranked first with a total of 152 publications, overall United Kingdom was ranked first with 2,352 citations in terms of the number of total citations by country followed by United States (2,256), Australia (1,690), Germany (1,173), Spain (816), and China (602).

Table 4: Top 13 Countries Contributed to the Publications

Country	TP	NCP	TC	CP	C/CP	<i>h-Index</i>	<i>g-Index</i>
1 United States	152	127	2256	14.8	17.8	26	41
2 United Kingdom	100	85	2352	23.5	27.7	25	47
3 Australia	89	76	1690	19.0	22.2	25	39
4 China	75	46	602	8.0	13.1	13	23
5 Spain	69	55	816	11.8	14.8	16	27
6 Germany	64	53	1173	18.3	22.1	17	33

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

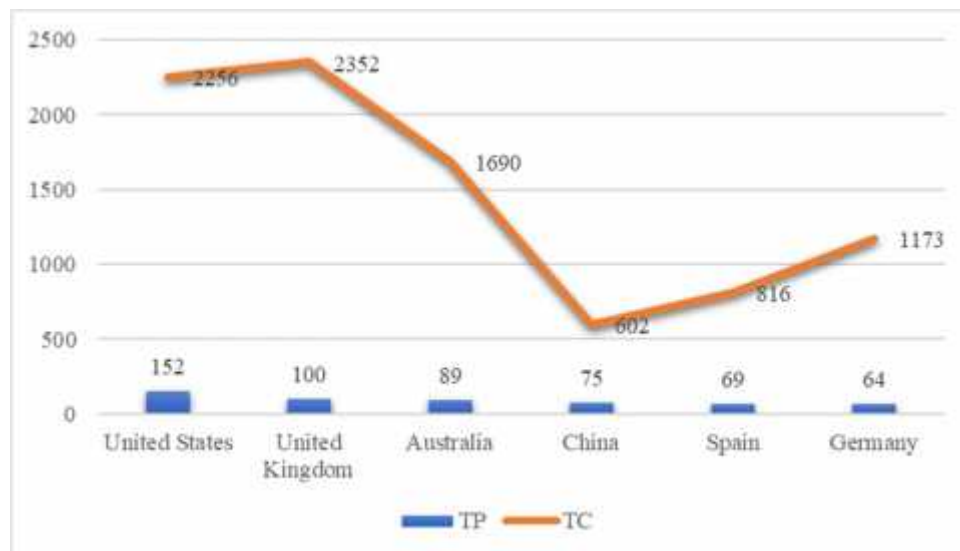


Figure 2: Total Publications and Citations by Countries



4.6 Authorship Analysis

The most prominent authors conducting studies on sustainable management publications are also analysed in this report. The writers were listed in Table 5 with at least ten publications. Benzaazoua, M., Blasiak, R., Calado, H., Kalutara, P., Setunge, S., Wakefield, R., Yagi, N., and Zhang, G. are among the top scholars in this field with at least four publications on sustainable management studies. The cumulative citation displays the proportion of times the sustainable management researches has been cited by other journals listed in Scopus database. Most articles were contributed by Benzaazoua to Zhang. Top cited article on sustainable management was written by Calado, H. (40) followed by Benzaazoua, M. (39), Blasiak, R. and Yagi, N. (26), and Kalutara, P., Setunge, S., Wakefield, R., and Zhang, G. with 12 total citations.

Table 5: Top 8 Productive Authors

	Author	TP	NCP	TC	CP	C/CP	h-Index	g-Index
1	Benzaazoua, M.	4	3	39	9.8	13.0	3	4
2	Blasiak, R.	4	4	26	6.5	6.5	3	4
3	Calado, H.	4	4	40	10.0	10.0	4	4
4	Kalutara, P.	4	3	12	3.0	4.0	2	3
5	Setunge, S.	4	3	12	3.0	4.0	2	3
6	Wakefield, R.	4	3	12	3.0	4.0	2	3
7	Yagi, N.	4	4	26	6.5	6.5	3	4
8	Zhang, G.	4	12	12	3.0	1.0	2	3

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

4.7 Citation Analysis

We used Harzing’s Publish or Perish software to obtain the citation metrics for the retrieved data. Data gathered from the Scopus database has been imported into this software to generate the citation metrics. Table 6 summaries the citation metrics for the retrieved documents, as of December 13, 2020. The summary includes the total number of citations with their citation per year, citations per paper, citations per author, h-index, and g-index.

For the last 28 year (1992-2020), 1065 papers were published with a total of 164 authors and 14,695 total citations. On average, citation per years, citation per paper, and citation per author are 524.82, 13.80, and 89.60 respectively. Paper per author accounted about 6.49 with author per paper at 0.15. The h-index and g-index were 57 and 89 as on December 13, 2020.

Table 6: Citations Metrics

Metrics	Data
Publication years	1992-2020
Citation years	28 (1992-2020)
Papers	1065
Authors	164
Citations	14695
Citations/year	524.82
Citations/paper	13.80
Citations/author	89.60
Papers/author	6.49
Authors/paper	0.15
<i>h-Index</i>	57
<i>g-index</i>	89



4.8 Keywords Analysis

The authors' keywords were mapped with VOSviewer, a software tool for creating and visualizing bibliometric networks. Figure 3 presents a network visualization of the authors' keywords, whereby colour, frame size, font size, and thickness of connecting lines were used to indicate the relationships among the keywords. For example, keywords with the same colour were commonly listed together. Thus, in this analysis, for instance, sustainable development, decision making, economics, planning, commerce, economic and social effects have similar colour (red) or management, ecotourism, tourism management, resource management, and stakeholder that have similar green colour or environmental impact, recycling or life cycle that have similar blue colour after excluding the main search query keyword sustainable management, suggesting these keywords are closely linked and usually co-occurred.

Visualisation Map

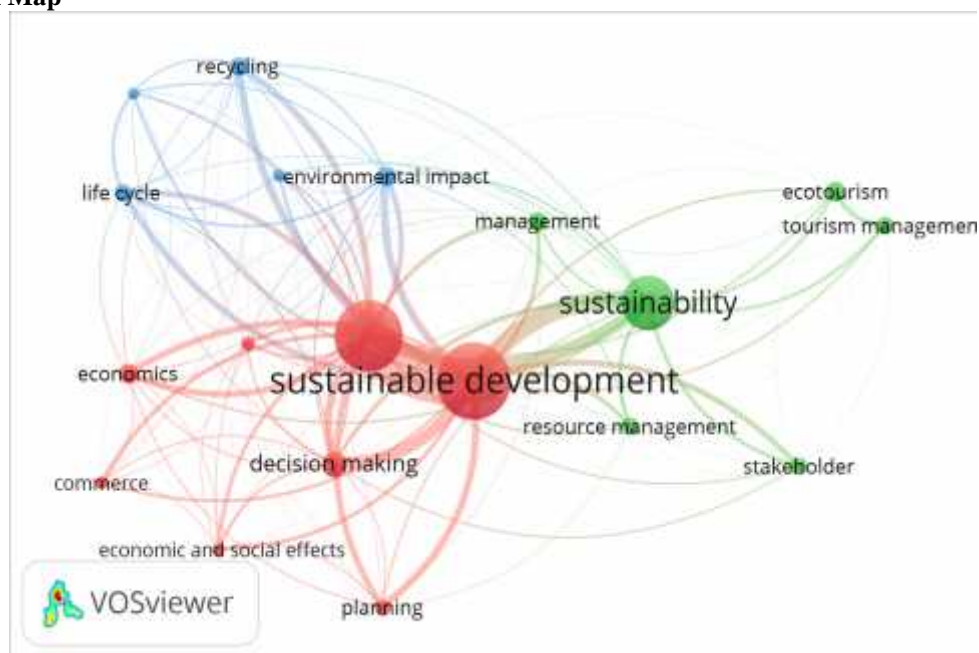


Figure 3: Network visualisation map of the author keywords

Meanwhile, after excluding core keywords listed in the search query: TITLE-ABS-KEY ("sustainable management") AND (LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "ECON")) among 4 keywords with the highest occurrences are sustainable development, sustainable management, sustainability, and decision making. Table 7 displays the top 16 keywords used in sustainable management studies.

Table 7: Top 4 Keywords

	Keyword	Total Publications (TP)	%
1	Sustainable Development	358	38.2
2	Sustainable Management	313	33.4
3	Sustainability	205	21.9
4	Decision Making	60	6.4

5. Conclusions

This analysis examined the key developments in global studies on the subject of sustainable management between 1992 and 2020, from the publishing of the first paper on this topic to the last full year. A bibliometric review of 1065 articles from Scopus was created. Thus, the evolution of publication, document and source types, languages of documents, subject area, the most productive countries, most productive authors, citations metrics analysis, and thematic areas were identified in the publications on this research topic.



During the time, the amount of scientific papers each year has increased particularly in the last five years in which 639 articles were written, reflecting 60 percent of contributions to this research subject. In this study, we only focusing on business, management and accounting, and economics, econometrics and finance subject area. This shows the interaction between sustainable management and modern society and organisational behaviour. This study topic has significance and importance for the global scholars' community.

Top 8 authors who actively write sustainable management articles, seven are of non-European origin (Benzaazoua, Blasiak, Kalutara, Setunge, Wakefield, Yagi, and Zhang). These scholars use keywords relevant to sustainable management e.g. sustainable development, decision making, economics, planning, commerce, economic, social effects, management, ecotourism, tourism management, resource management, stakeholder, environmental impact, recycling or life cycle.

The countries that participated most in these fields are the United States (152), preceded by UK (100), Australia (89), China (75), Spain (69) and Germany (64). While the US ranked first with a total of 152 publications, ultimately the United Kingdom ranked first with 2,352 citations in terms of the amount of total country citations led by the United States (2,256), Australia (1,690), Germany, Spain (816) and China (602).

Finally, over the last 28 years (1992-2020), 1065 articles were written with a total of 164 contributors and 14,695 total citations. Average citation per year, citation per paper, and citation per author are 542.82, 13.80, and 89.60, respectively. Paper per author accounted for about 6.49 with author at 0.15. h-index and g-index on December 13, 2020 were 57 and 89.

5. Limitation and Study Forward

Our analysis has some drawbacks inherent in the database. It should also be stressed that while Scopus is one of the biggest indexes, there are still unindexed articles, because it may have been overlooked for publications in these journals. In comparison, this report centred only on the topic of protection and elephant studies, based on the title of the paper. Thus, other research related to intellectual capital and success was also disregarded, but it did not explicitly contain the word in the title. It is also crucial to note that no search query that exists is 100% perfect, false positive and false negative outcomes. The search question may be expanded by potential study to other databases, such as the Network of Science and Google Scholar. It may contribute to more thrilling and invaluable results by integrating these three databases. Also, in future, the bibliometric approach may be extended to evaluate study patterns using other quantitative or qualitative methods and could include various viewpoints.

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