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Research article

The three pillars of sustainability trends: A bibliometric analysis

Los tres pilares de las tendencias de sostenibilidad: Un análisis bibliométrico

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Abstract:
Introduction: The purpose of this article is to identify the progress made in sustainability and its three pillars, environmental, social and economic, in order to extract the core aspects and contribute to economic growth, social progress and the promotion of environmental sustainability. **Methodology**: A bibliometric analysis was carried out on the sample of 4.166 articles retrieved from the Scopus database using VOSviewer, a software tool commonly used in bibliometric studies and focusing on the main dimensions of sustainability: environmental, social and, economic. This paper presents the theoretical aspects of the study of journals, researchers, or individual publications, keywords, institutions based on citation, bibliographic coupling, co-citation. **Results and discussions:** The results suggest that sustainability measurement is an emerging area of research. Influential categories are social sciences, environmental sciences, and business, management, and accounting. Prominent authors such as Scholtens, Zaman, and Berman contribute to the field. Five distinct clusters have been identified: "sustainable development", "sustainability", "economics", "economic analysis", "decision support systems". The top keywords in the social cluster ("economics and social effects"), the economic cluster("economics", "commerce", "economic development", "financial system", "financial sustainability", "environmental economics"), and the newest but strongest environmental cluster ("climate change", "environmental protection",

"environmental management"). **Conclusions**: It also presents the expectations and challenges of sustainability, allowing trends to be identified and assessed. Consequently, this research will support the lines of research with more impact ton mapping in sustainability research.

Keywords: sustainability; bibliometric analysis; environmental; social and economic dimensions; VOSviewer.

Resumen:
Introducción: El objetivo de este artículo es identificar los avances logrados en materia de sostenibilidad y sus tres pilares, medioambiental, social y económico, con el fin de extraer los aspectos esenciales y contribuir al crecimiento económico, el progreso social y la promoción de la sostenibilidad medioambiental. **Metodología:** Se realizó un análisis bibliométrico de la muestra de 4.166 artículos recuperados de la base de datos Scopus utilizando VOSviewer, una herramienta de software comúnmente utilizada en estudios bibliométricos y centrándose en las principales dimensiones de la sostenibilidad: ambiental, social y, económica. Este trabajo presenta los aspectos teóricos del estudio de revistas, investigadores, o publicaciones individuales, palabras clave, instituciones basadas en la citación, el acoplamiento bibliográfico, la co-citación. **Resultados y discusiones:** Los resultados sugieren que la medición de la sostenibilidad es un área emergente de investigación. Las categorías influyentes son las ciencias sociales, las ciencias medioambientales y las ciencias empresariales, de gestión y contabilidad. Autores destacados como Scholtens, Zaman y Berman contribuyen a este campo. Se han identificado cinco grupos distintos: "desarrollo sostenible", "sostenibilidad", "economía", "análisis económico", "sistemas de apoyo a la toma de decisiones". Las principales palabras clave del grupo social ("economía y efectos sociales"), el grupo económico ("economía", "comercio", "desarrollo económico", "sistema financiero", "sostenibilidad financiera", "economía medioambiental"), y el grupo medioambiental más reciente pero más fuerte ("cambio climático", "protección del medio ambiente", "gestión medioambiental"). **Conclusiones:** También presenta las expectativas y desafíos de la sostenibilidad, permitiendo identificar y evaluar tendencias. En consecuencia, esta investigación apoyará las líneas de investigación con más mapeo de tonelada de impacto en la investigación de la sostenibilidad.

Palabras clave: sostenibilidad; análisis bibliométrico; dimensiones medioambiental, social y económica; VOSviewer.

1. Introduction

Sustainability is increasingly seen as a desirable goal of development and environmental management. The meaning of the term depends heavily on the context in which it is used and whether it is use is based on a social, economic or environmental perspective (Brown et al., 1987; Shearman, 1990). Previous literature reviews have defined sustainability as the maintenance, renewal or restoration something specific, but it must also include the ethical dimension of the fairness of the balance between current economic pressures and the future needs of the population (Sutton, 1999).

The uses and conceptualisations of sustainability have been identified, socially defined sustainability is the survival and well-being of the greatest number of people, or the provision of minimum needs for even the poorest groups. The environmental definition focuses on natural biological processes and the continued productivity and functioning of ecosystems, and economic sustainability includes both the inevitability of economic growth without regard to sustainability except as a recognition of the ecological limits which are placed on economic growth (Brown et al., 1987).

In discussing alternative perspectives on sustainability, Maslow (1970) said that the social perspective is more concerned with individuals than with nations. For example, a social definition of sustainability might include the continued satisfaction of basic human needs-food, water, shelter – as well as higher level social and cultural needs such as security, freedom, education, employment and recreation. Thus, social concerns might include a special focus on particular minority, age, racial, cultural and income groups, sometimes in relation to particular geographical regions.

The environmental definition of sustainability focuses on natural biological processes and the continued productivity and functioning of ecosystems. Long-term ecological sustainability requires the protection of genetic resources and the conservation of biological diversity (Wilderness Society, 1986). The economic sustainability definition is more elusive, as economists tend to assume the inevitability of economic growth, and do not for the issue of sustainability. They must then resolve the constraints that a sustainable society must place on economic growth and must deal with the non-marketable often unquantifiable values of ecosystems and long-term global health (Ehrenfeld, 1976). Review some of the ways in which it has been defined to clarify the terms sustainable, sustained, and sustainability and sustainable development (Brown et al., 1987).

The meaning of sustainability and sustainable development is not the same. Sustainability refers to a system property called quality. Historically, the definition of Sustainability has mostly been understood as environmental sustainability (IUCN, UNEP, WWF, 1980).
More generally, sustainable development refers to the use of renewable natural resources in a way that does not eliminate, or degrade or otherwise reduce their usefulness for future generations (Moldan et al., 2012). Furthermore, sustainable development used to be more or less understood as social and economic development that should be environmentally sustainable. Then, sustainable development was defined by the World Commission on Environment and Development (Butlin, 1989) as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

The implementation of the objectives of sustainable development and the recent European regulations on CSR, sustainability and transparency are bringing about a significant change in the various strategies adopted by the management bodies of the companies. It is necessary to analyse these strategies from their formulation to their implementation and control. Factors such as the formulation of the long-term versus short-term sustainable strategy, the involvement of corporate governance bodies (cultural or gender diversity), its link to certain organizational areas or the existence of control mechanisms can determine its effectiveness. in organizational performance (García-Sánchez et al., 2021).

The present study aims to narrow the identified gap by performing a mapping study, analyzing the emergenging literature on the sustainability from an economic, social and environmental perspective, exploring a large sample of publications using a bibliometric analysis method and VOSviewer software. The study analyzes previous literature and collects data about trends sustainability measurement with number of publications from 1985 to 2020, including keywords dimensions such as social, economic and environmental.

The idea of principles focuses on the concept of sustainability such as: Security, the basic material for a good life, health, good social relations and freedom of choice and action. In the same line, the formulation about human life should be healthy productive and in harmony with nature and another essential principle is dynamic and long-term nature. It takes into account present and future generations.

Several scholars have called for a better understanding of underlying sustainability (Mesenguer-Sánchez, 2021; Aguinis & Glavas, 2012). In addition, reporting research and practice increasingly began to consider the social and environmental dimensions simultaneously in a joint report that is often published alongside traditional financial reports. Third trend has been associated with the development of voluntary standard by the Global Reporting Initiative (GRI) (Hahn & Kühnen, 2013).

Based on these principles, sustainability has been developed into three main pillars (economic, environmental and social). These, these three principles then apply to all three pillars.

The economic dimension refers to different types of capital (man-made, natural, human, social) that should be sustained (Bolt et al., 2005). The importance of economic sustainability is now increasingly recognized at the highest political level. The economic aspects of development are being closely scrutinised. For this reason, the current global economic crisis has called into question the sustainability of development based on economic progress, as maintaining economic growth is the main policy objective around the world and is considered essential and universally accepted.

As for the environmental dimension, it was coined by scientist at the World Bank in 1992. It was used in the terms of "environmentally responsible development". The importance lies in ensuring that the sink for human waste is not exceeded and that the sources of raw materials used for human needs are protected. Environmental is understood as the ability to maintain the qualities that are valued in the physical environment (Sutton, 2004). Four criteria of environmental sustainability have been defined by the OECD (2001): regeneration, substitutability, substitution, assimilation. Understanding the influence of individual attitudes on environmental decisions is crucial (Hamdan et al., 2023), highlighting the importance of values, ethics, and behaviours in environmental education approach (Hamdan et al., 2023).

The social dimension approach refers to "policies and institutions that have the overall effect of integrating diverse groups and cultural practices in a just and equitable manner (Polese & Streen, 2000; Dillard et al., 2008), and require that the cohesion of society and its ability to work towards common goals be maintained such that individual needs (health, well-being, nutrition, shelter, education and cultural expression should be met (Gilbert, 1996). This pillar has been recognised as the most important and critical for the long-term survival of human civilisations. According to the Bolt et al. (2005) the human and social capital is the most important component of national wealth.

In particular, in the context of sustainability, two research questions have been formulated in this paper.
(RQ1) What are the trends between environmental, social and, economic dimensions?
(RQ2) What is the impact of published studies on sustainability according to subject area?

This paper is divided into three main parts. The methodology is discussed in the next section., the results and discussion of the study are presented in the following section and Finally the conclusions.

2. Methodology

Research using bibliometric analysis, a study method consisting of identifying, organising and analysing works on the concept of sustainability as well as the key trends in sustainable. This research paper is structured as a bibliometric analysis, a study method consisting of identifying, organising and analysing the main components of a given research field (Lievrouw, 1989; Zupic & Cater, 2015). Through the use of mathematical, statistical, and mapping tools, a total of 4.166 articles on the concepts of sustainability, social sustainability, economic sustainability, environmental, sustainable development have been analysed in order to identify the main trends in financial sustainable.

The main databases related to the area of knowledge have been searched from Scopus with the largest volume of number of papers, authors and journals (Harzing & Alakangas, 2016). The search for these research papers was carried out in December 2021, while the statistical analysis has focused on the last 35 years, i.e. the period between 1985 and 2020.

The search was based on "sustainability" or "social sustainability" or "economic sustainability" or "environmental sustainability" or "Sustainable development" and Title-Abs-Key("finance") and limited to (Doctype) and restricted to (Language,"English"). The functionality of the VOSviewer software is then particularly useful for displaying large bibliometric maps in an easy-to-interpret way, e.g. it can be used to construct maps of authors or journals based on co-citation data or to construct maps of keywords based on co-occurrence data (Van Eck, and Waltman, 2010).

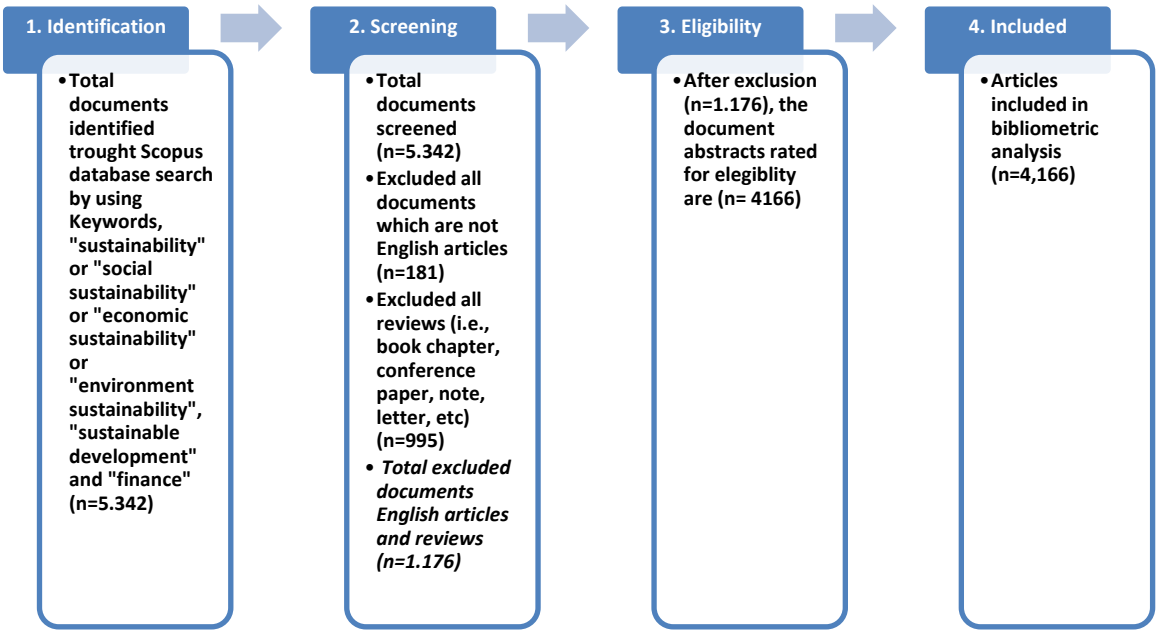
Indeed, various studies have used this software to explore sustainability in different domains, including the Triple Bottom Line (TBL) (Tseng et al., 2020), organisational management (Ogutu et al., 2023), and Corporate Sustainability Performance (CSP) (Ye et al., 2020; Gardazi et al., 2023), sustainable tourism (del Vasto & Castro, 2023), and sustainability and entrepreneurship (Amar et al., 2021; Amar et al., 2023).

The construction of a map is a three-step process. In the first step, a similarity matrix is calculated based on the co-occurrence matrix. In the second step, a map is constructed by applying the VOS mapping technique to the similarity matrix. Finally, in the third step, the map is translated, rotated, and reflected.

This work was carried out in January 2021, while the statistical analysis has focused on the last 35 years. That is, the period during which the global lockdowns by COVID-19 have had a significant short-term impact on greenhouse gas emissions, as well as being a catalyst for short-term climate benefits and the Biodiversity Strategy 2030 that was announced by the European Commission in 2020. The Figure 1 shows the logical sequence used to obtain the data for the study (PRISMA, 2020).

Figure 1.

PRISMA Flow chart for bibliometric analysis



Source: own elaboration (2024).

The Figure 1 shows the filtering strategy for the bibliometric review in four stages: first, the database search (Scopus) with search criteria (sustainability, or social sustainability, or economic sustainability, or environmental sustainability, or sustainable, or sustainable development and finance). Second, the scientific filtering (time frame 1985-2020, with document type: articles). Third, the eligibility (the total number of excluded documents excluding non-English articles and reviews, n=1.176), and finally the database.

In this research have been analyzed different maps and graphs were analysed, such as publication year, the subject area, the author, the co-authors, the institution, the country, the keywords and the evolution of scientific production -based on the productivity of authors, countries, institutions, citations, the H-index and the SJR impact factor.

3. Results and discussion

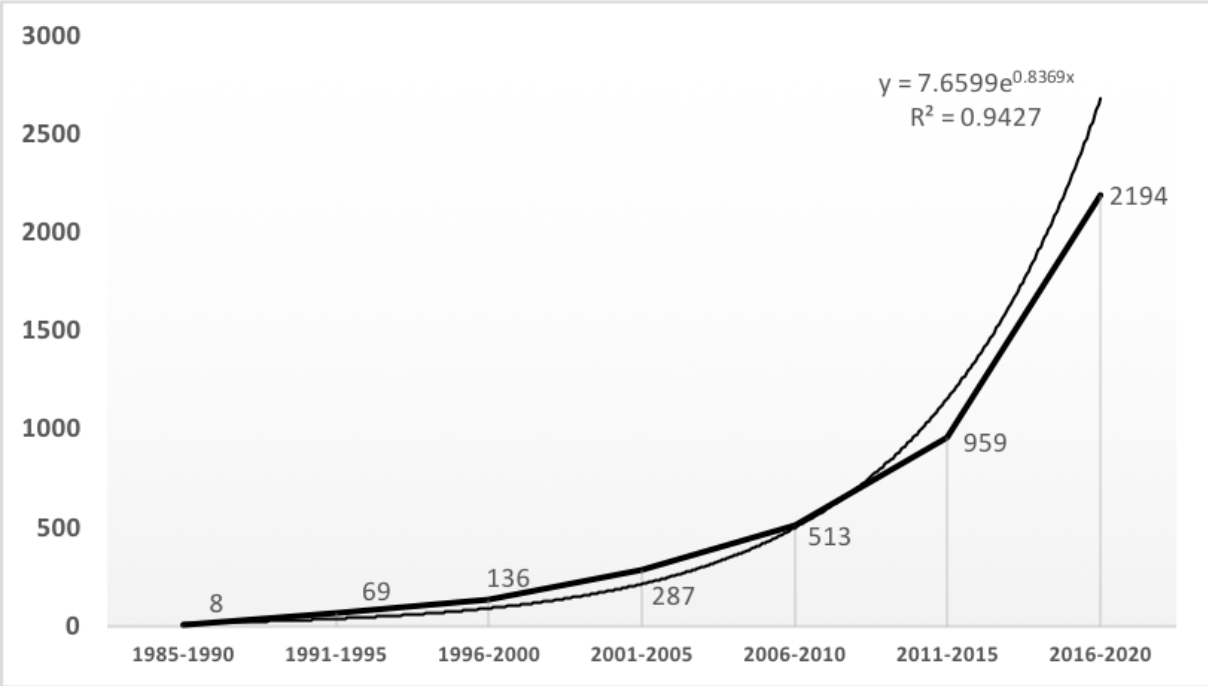
The study analyses previous literature and collects data on trends in sustainability measurement with the number of publications from 1985 to 2020, including keywords dimensions such as social, economic and environmental.

3.1. Evolution of scientific production (RQ1)

This section presents the characteristics of scientific production in the field of Sustainability measurement during the study period, including the number of published articles and their authors, countries, citations and the scientific journal concerned, as well the percentages of variation between periods. The time horizon covers 35 years and is divided into five-year sub-periods to facilitate analysis (see Figure 2).

Figure 2.

Evolution of the number of articles and exponential variation between periods

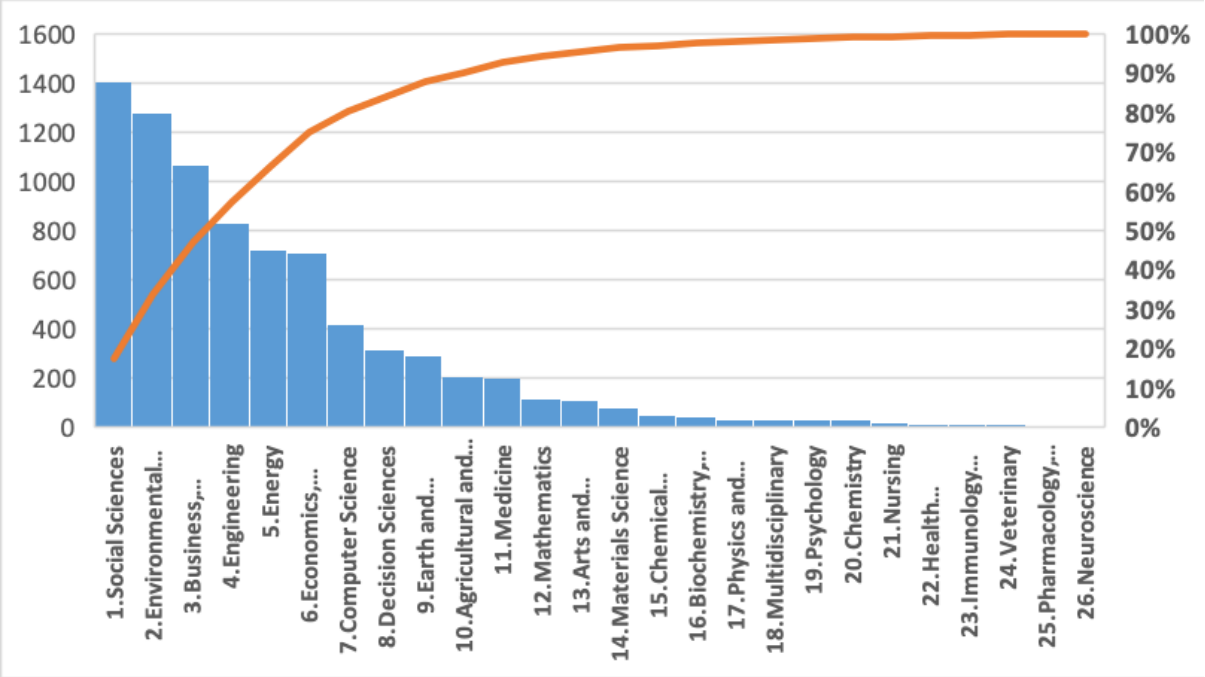


Source: own elaboration (2024).

The data show an impressive increase in scientific production over the last 35 years. In the first five years (1985-1990), only 8 articles were published in this field. However, from the first period to the last five years (2016-2020), there were 2194 publications, an increase of 27325%. Similarly, an increase in scientific publications can be observed in the five-year period (2011-2015) with 959 publications, which coincides with the publication of ISO 26000 Social Responsibility, published in 2012, which provides guidance to those who recognise that respect for society and the environment it a critical success factor. Furthermore, the increase in publications over the five-year period (2016-2020) coincides with the "European Green Deal" by European Commission in 2019, which aims to promote the efficient use of resources by moving towards a clean, circular economy and to halt climate change, reverse biodiversity loss and reduce pollution, among others things. This has led to an exponential growth in the number of articles published (see Figure 3).

Figure 3.

Distribution by subject areas



Source: own elaboration (2024).

3.2. Distribution by subject areas (RQ2)

The time horizon covers 35 years and is divided into five-year sub-periods for ease of analysis. The trend regarding to distribution by subject area shows that the majority of articles published were in Social Sciences with 1.406 documents, Environmental sciences with 1.280 documents, and Business, management and accounting with 1.068 documents (see Table 1).

Table 1.

Distribution by subject areas

No.	Subjet area	Number of documents
1	Social Sciences	1406
2	Environmental Science	1280
3	Business, Management and Accounting	1068
4	Engineering	833
5	Energy	720
6	Economics, Econometrics and Finance	706
7	Computer Science	418
8	Decision Sciences	312
9	Earth and Planetary Sciences	291
10	Agricultural and Biological Sciences	205
11	Medicine	198
12	Mathematics	115
13	Arts and Humanities	106
14	Materials Science	77
15	Chemical Engineering	48
16	Biochemistry, Genetics and Molecular Biology	43
17	Physics and Astronomy	32
18	Multidisciplinary	31
19	Psychology	31
20	Chemistry	30
21	Nursing	15
22	Health Professions	14
23	Immunology and Microbiology	13
24	Veterinary	10
25	Pharmacology, Toxicology and Pharmaceutics	8
26	Neuroscience	5

Source: own elaboration (2024).

3.3. Distribution of publication by Journal

Table 2 thus shows the main characteristics of the articles published in the 10 most productive scientific journals between 1985 and 2020. With the characteristics of the total number of research articles published in the research field, the total number of citations received by these research articles, the average number of citations, the H-index of the research articles, the H-index of the journal, the Scimago Journal Rank (SJR), the country to which the journal belongs.

Table 2.

Ranking 10 journals with the highest scientific production

Journal	A	TC	TC/A	H index A	H index J	SJR	C	First Article	Last Article
Sustainability Switzerland	232	1655	7,13	80	85	0.61 (Q1)	Switzerland	2013	2020
Journal Of Cleaner Production	82	2631	32,09	24	200	1.94 (Q1)	United Kingdom	2003	2020
Energy Policy	43	1131	26,30	16	217	2.09 (Q1)	United Kingdom	1993	2020
Journal Of Sustainable Finance And Investment	30	191	6,37	9	16	0.45 (Q2)	United Kingdom	2011	2020
Business Strategy And The Environment	24	963	40,13	8	105	2.12 (Q1)	United Kingdom	1997	2020
Climate Policy	19	298	15,68	8	66	1.76 (Q1)	United Kingdom	2008	2020
Land Use Policy	19	725	38,16	6	115	1.67 (Q1)	United Kingdom	2007	2020
Wit Transactions On Ecology And The Environment	18	63	3,50	7	21	0.18 (Q3)	United Kingdom	2006	2019
World Development	17	428	25,18	5	175	2.39 (Q1)	United Kingdom	1996	2020
Technological Forecasting And Social Change	16	601	37,56	5	117	2.23 (Q1)	Umited States	2004	2020

(A): number of articles; (TC) number of citations; (TC/A): an average of citations per article; (H) (A) H-index of the articles; (H) (J): H-index of the journal; (SJR): Scimago Journal Rank (quartile); (C): country.

Source: own elaboration (2024).

3.4. Author productivity

This section aims to show the authors with higher productivity, as well as the collaboration between them based on the co-authorship indicator. The Table 3 shows the variable analyzed of the ten most productive researchers on Sustainability measurement during the period (1985-2020). All the authors are from: Anglo-Saxon (56,39%), European (20,37%), Asian (18,07%), Netherlands (5,17%) see Table 6.

Table 3.

Most productive authors

Autores	D	TC	TC/A	Institution	C	1st A	Last A	H index
Scholtens, B.	8	329	41.13	University of Groningen	Netherlands	1998	2019	2
Tsai, S.B.	6	26	4.33	Wuyi University	China	2018	2018	2
Weber, O.	6	114	19.00	University of Waterloo	Canada	1999	2020	1
Afonso, A.	5	83	16.60	Instituto Superior de Economia e Gestão	Portugal	2010	2017	2
Foster, T.	5	79	15.80	University of Technology Sydney	Australia	2016	2020	3
Hope, R.	5	124	24.80	University of Oxford	United Kingdom	2015	2020	3
Lagoarde-Segot, T.	5	60	12.00	KEDGE BS and Sustainable Finance Group of SDSN	France	2016	2020	3
Zaman, K.	5	139	27.80	University of Haripur	Pakistan	2017	2020	2
Asongu, S.A.	4	25	6.25	University of Cape Town	South Africa	2020	2020	1
Berman, P	4	115	28.75	The University of British Columbia	Canada	2001	2018	1

Source: own elaboration (2024).

The most productive author is Scholtens from the University of Groningen with a total of eight articles published during the period (1985-2020), is also the author has the highest number of citations 329 and, with the highest average number of citations (41.13), followed by Tsai and Webber with a total of six articles.

3.5. Keyword analysis

With regard to the analysis of sustainability measurement for the total of 4166 articles in the period (1985-2020), a total of 3670 keywords have been obtained. In Table 3 the most relevant keywords have been considered by the authors that have been generated in the research line based on the dimensions cited in the contextualisation, throughout the period studied. In this sense, three thematic axes have been distinguished. The first of them, on social dimension, to know the evolution of the dimensions that compose it with economic has 1729 documents that represent (41.50%), we found that 1148 papers that represent (27,56%) the social dimension, and environmental with 793 documents that represent (19,04%), although it adds up to 88.09% there are other areas but not in the vast majority that represent a majority.

The trends in business sustainability studies have prompted mergers and are critical when it comes to the global level of competition under the conditions of risks and opportunities.

Table 4.

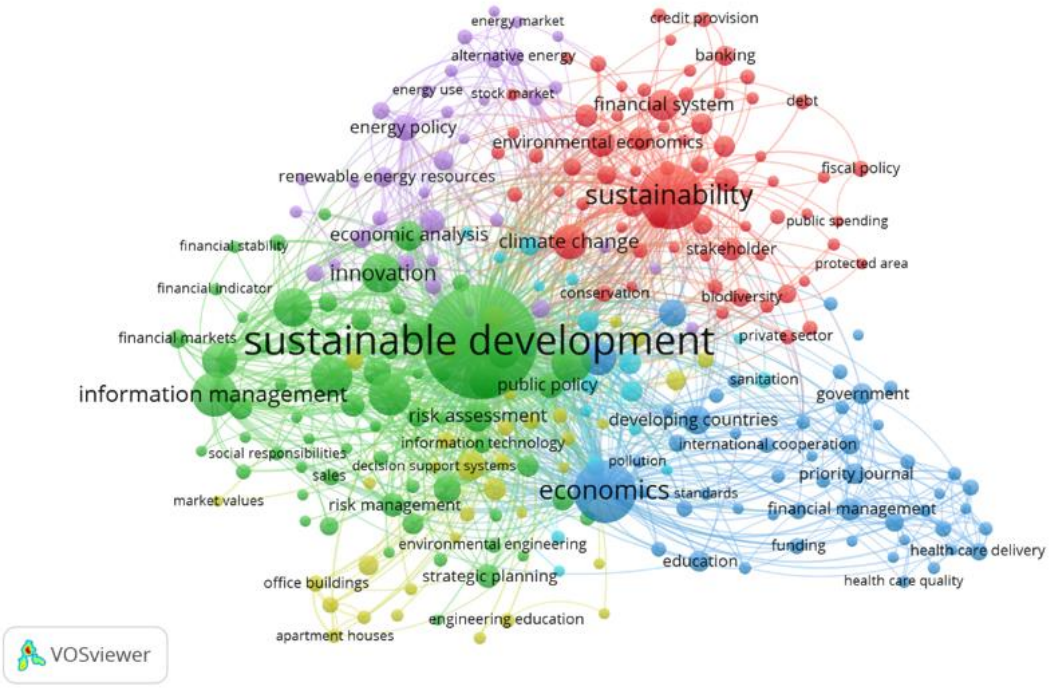
Keywords by social, economic and environmental dimension

Social dimension			Economic dimension			Environmental dimension		
Keyword	**n**	**%**	**Keyword**	**n**	**%**	**Keyword**	**n**	**%**
Economics and social effects	238	5.71%	Economics	515	12.36%	Climate change	205	4.92%
Rural areas	99	2.38%	Economics and social effects	238	5.71%	Environmental protection	174	4.18%
Microfinance	76	1.82%	Commerce	196	4.70%	Environmental management	139	3.34%
Education	70	1.68%	Economic development	124	2.98%	Environmental impact	138	3.31%
Social aspects	61	1.46%	Financial system	136	3.26%	Environmental economics	109	2.62%
Poverty	59	1.42%	Financial sustainability	116	2.78%	Energy policy	96	2.30%
Female	58	1.39%	Environmental economics	109	2.62%	Energy efficiency	94	2.26%
Male	46	1.10%	Economic growth	99	2.38%	Environmental policy	68	1.63%
Healt care cost	45	1.08%	Financial performance	99	2.38%	Water management	66	1.58%
Adult	41	0.98%	Risk management	97	2.33%	Renewable energy resources	59	1.42%
Social dimension	**793**	**19.04%**	**Economics dimension**	**1729**	**41.50%**	**Environmental dimension**	**1148**	**27.56%**

Source: own elaboration (2024).

Figure 4.

Research themes on Sustainability Measurement



Source: own elaboration (2024).

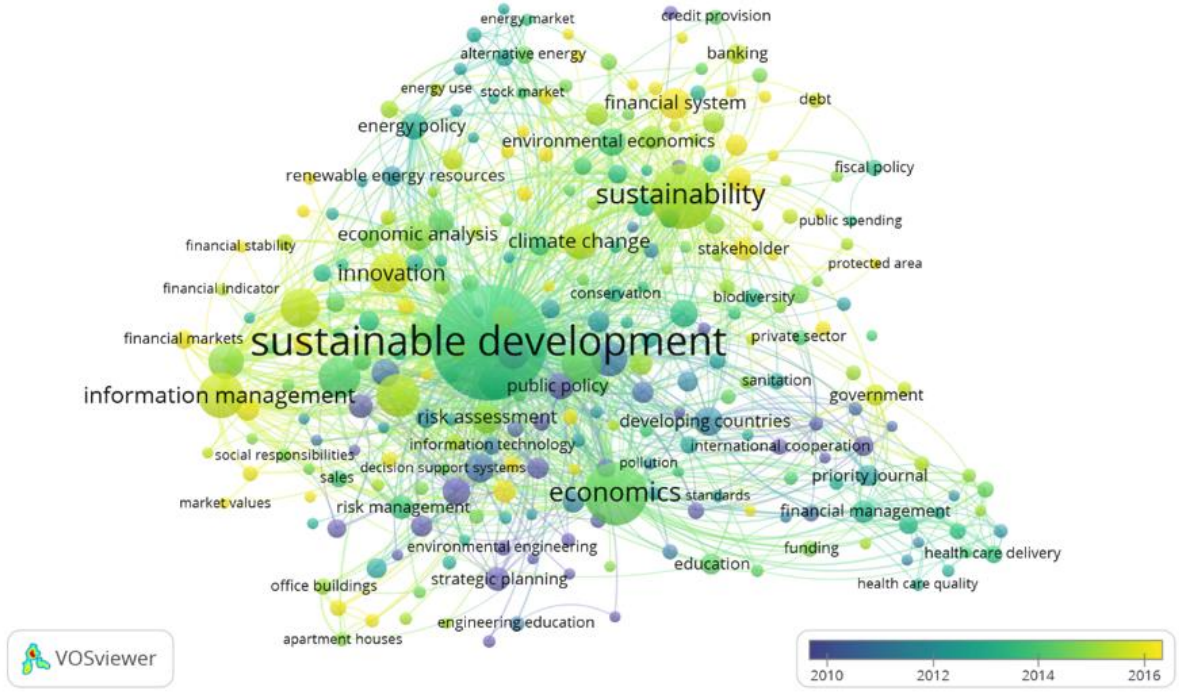
With regard to the analysis of research themes on sustainability measurement, Figure 5 shows different clusters in order of greatest weight (green, red, blue, purple, and yellow).

The first cluster is the green cluster with the research theme of sustainable development most used with information management, innovation, among others. This theme has the highest weight. This is followed by the red cluster with the research theme of sustainability, climate change and financial system's research theme. The third cluster shows the blue cluster with economic, developing countries' research theme, among many others. The fourth cluster

shows the purple cluster with economic analysis, stock market's research theme, and the last yellow cluster shows decision support systems, engineering education, among others.

Figure 5.

Evolution research themes on Sustainability Measurement based on co-occurrence



Source: n elaboration (2024).

Evolution Research themes on Sustainability measurement based on co-occurrence in the Figure 5 shows that el cluster (green) of sustainable development and economic has evolved in mid-2012.

Follows this cluster with sustainability that has evolved from the year 2015, and the four cluster with economic analysis is more recent 2016. Despite the promotion of the social dimension to build a global inclusion, the research theme shows a dimension with low development in the literature review.

3.6. Highly cited articles

Table 5 shows the 10 highly cited articles. The results show two quite different growth periods of highly cited articles over the past 35 years (2001-2005 with only 2 articles) and (2016-2020 with the vast majority).

We consider that these reports to have been instrumental in establishing the concept of sustainability at the forefront of environmental, social and economic studies. As a result, global research interest and popularity among researchers has increased. Notably, only one highly cited article was published in 2014, which is the top article (Cheng et al., 2014). Our findings are consistent with other previous observations that the sustainability concept has increasingly gained attention at the global level while becoming a top research area in environmental fields (Gardazi et al., 2023; Amar et al., 2021).

Table 5.

Highly cited articles

Title	Authors	Journal	Year	TC
Corporate social responsibility and access to finance.	Cheng, B., Ioannou, I., Serafeim, G.	Strategic Management Journal	2014	1833
Is accounting for sustainability actually accounting for sustainability...and how would we know? An exploration of narratives of organisations and the planet.	Gray, R.	Accounting, Organizations and Society	2010	782
Critical junctures in the development of university high-tech spinout companies.	Vohora, A., Wright, M., Lockett, A.	Research Policy	2004	765
The long-term benefits of organizational resilience through sustainable business practices.	Ortiz-de-Mandojana, N., Bansal, P.	Strategic Management Journal	2016	536
Critical success factors for public-private partnerships in infrastructure development.	Zhang, X.	Journal of Construction Engineering and Management	2005	526
Corportate green bonds.	Flammer, C.	Journal of Financial Economics	2021	518
The way to induce private participation in green finance and investment.	Taghizadeh-Hesary, F., Yoshino, N.	Finance Researh Letters	2019	435
The influence of Firm Size on the ESG Score: Corporate Sustainability Ratings Under Review.	Drempetic, S., Klein, C., Zwergel, B.	Journal of Business Ethics	2020	428
Do environmetal, social, and governance activities improve corporate financial performance?	Xie, J., Nozawa, W., Yagi, M., Fujii, H., Managi, S.	Business Strategy and the Environment	2019	421
Inequality, ICT and financial access in Africa.	ıamyou, V.S., Erreygers, G., Cassimon,	Technological Forecasting and Social Change	2019	378

Source: own elaboration (2024).

3.7. Productivity of countries and institutions

This section aims to identify the most productive countries and institutions in terms of sustainability trends over the period analysed

The origin is not much more diversified, although Anglo-Saxon (United States, United Kingdom, Canada, Australia) predominates, with 56,39%, Europe with 20,37% (Germany, Italy, Spain), Asia (China, India) with 18,07%, followed by the Netherlands (5,17%). The United States is the country with the highest number of articles (553) followed by United Kingdom (440) and both countries are also the most cited.

Table 6.

Ranking of the most productive countries in the number of articles

Country	A	TC	TC/A	H index	NC	Main collaborators	IC (%)	TC/A	
								IC	NIC
United States	553	12046	21,78	134	83	United Kingdom, China, Canada, Germany, Switzerland	43,4%	24,08	20,02
United Kingdom	440	10516	23,90	100	67	United States, Australia, Netherlands. Germany, Canada	43,4%	25,70	22,52
China	280	3147	11,24	78	41	United states, Canada, United Kingdom, Australia, Hong Kong	40,7%	14,87	8,75
Germany	172	2603	15,13	49	47	United States, United Kingdom, Netherlands, Switzerland, France	44,2%	17,25	13,46
Australia	167	3355	20,09	44	47	United Kingdom, United States, China, Germany, Canada	51,5%	22,58	17,44
Spain	156	1945	12,47	38	30	United Kingdom, United States, Netherlands, Chile, Australia	29,5%	17,46	10,38
Italy	133	1501	11,29	38	29	United States, United Kingdom, France, Germany, Netherlands	34,6%	15,83	8,89
India	129	954	7,40	34	19	United Kingdom, United States, Canada, France, Germany	17,1%	18,14	5,19
Netherlands	117	2532	21,64	33	50	United Kingdom, United States, Germany, Sweden, China	60,7%	23,30	19,09
Canada	116	2554	22,02	30	42	United States, United Kingdom, China, France, Australia	63,8%	28,20	11,12

(A): number of articles; (TC) number of citations; (TC/A): an average of citations per article; H-index of the journal;
(NC): number of citations with self-citations; (IC): Cooperation Index; (NIC): Non-Cooperation Index

Source: own elaboration (2024).

Accordingly, in the present analysis of the most productive institutions (see Table 7). The best institution in the field of sustainability issue, corresponds to the World Bank with 29 articles, and 502 citations. This is followed by the University of Oxford with 25 articles and 533 citations.

Table 7.

Ranking of the most productive institutions

							TC/A	
Institution	**C**	**A**	**TC**	**TC/A**	**H index**	**IC (%)**	**IC**	**NIC**
The World Bank, USA	United States	29	502	17,31	10	55,2%	12,56	23,15
University of Oxford	United Kingdom	25	533	21,32	8	60,0%	20,00	23,30
University College London	United Kingdom	24	664	27,67	5	41,7%	46,20	14,43
University of Sussex	United Kingdom	21	604	28,76	4	38,1%	43,63	19,62
University of Groningen	Netherlands	19	650	34,21	6	57,9%	28,45	42,13
University of Leeds	United Kingdom	18	432	24,00	7	38,9%	20,86	26,00
University of Cambridge	United Kingdom	18	310	17,22	4	77,8%	19,71	8,50
Wageningen University & Research	Netherlands	17	336	19,76	7	58,8%	23,60	14,29
Chinese Academy of Sciences	China	17	205	12,06	7	35,3%	20,67	7,36
University of Melbourne	Australia	16	350	21,88	6	56,3%	0,00	8,57

Source: own elaboration (2024).

4. Conclusions

The aim of this research is to analyse the research progress made in the field of different sustainability trends in terms of economic, social and environmental sustainability during the period 1985 to 2020, through a bibliometric analysis of 4.166 research articles recorded in the Scopus databases.

This is a bibliometric analysis with characteristics on sustainable for the Triple Bottom Line (TBL) by using VOSviewer software including an in-depth qualitative and quantitative analysis of bibliometric variables. Some useful theoretical observations can be made.

Firstly, the trends scientific production in this field concern to the evolution of the number of articles in the environmental, social and economic dimensions. Therefore, as shown in Figure 2, there has been an exponential growth over the last three decades. In the period (2016-2020), 2.194 articles have been published, which represents an increase of 27,325%.

The analysis of the research dimensions shows that, throughout the period analysed, we can also highlight the increase in the number of scientific journals related to the economic dimension (41,50%), followed by the environmental dimension (27,56%) and the impact of achieving the Sustainable Development Goals (SDG) and finally the social dimension (19,04%).

Secondly, in terms of the impact of published studies on sustainability according to subject area shows a scenario for future research to be published is shown, such as: social sciences, environmental sciences, business, management and accounting (see Table 1 and Figure 3). Thirdly, in terms of author productivity, most authors come from Anglo-Saxon countries (56,39%), Europe (20,37%), Asia (18,07%), and the Netherlands (5,17%), see Table 6.

Fourthly, the keyword analysis by social, economic and environmental elements shows the trend of sustainable development tend to create different links, with the economic elements being the most studied while the social elements are the least studied followed by the environmental (see Table 4 and Figure 4). Moreover, the increase in media coverage of "sustainability" since 1990 appears to be largely incremental. In addition to the "climate change", "environment protection", and "environment management", which are considered to be trend-setting claims in the environmental dimension.

Regarding to the evolution of research themes has shown that the sustainable development has been noted in the literature review, this can imply the dominance of content in disciplines not only of business and economic field but also, social sciences.

The analysis shows the beginnings of research into the social and environmental dimensions. Future studies could look at on social impacts or analyse stakeholder issues in the perception of both dimensions, and shows a continued and significant increase in sustainability together with the three dimensions. In addition, future research should explore the social dimension by addressing barriers that hinder people's ability to meet their needs and promote sustainable practices by removing these barriers, it is highlighted that the economic and environment dimensions as a general topic in business and management studies as evidenced by scholarly publishing has rapidly accelerated both in terms of articles published and cited.

In conclusion, this bibliometric analysis helps to accurately reflect the state of development of sustainability and the 3 Pillars research field by visualisingin emerging trends and currently focused topics. Therefore, the emerging themes in this field of study can provide guidance for further research in this approach.

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