

# ESG's future on Sustainability Reporting: Bibliometric Analysis

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**Abstract.** This study aims to describe the mapping of the Company's business activities to sustainability reports and how it is implemented on ESG, with the expectation that it can take into account the interests of stakeholders, such as workers, communities, investors, and the environment. There are various justifications for examining how environmental, social, and governance-related issues relate to ESG Performance and Sustainability Reporting. This study examines the effectiveness of publication trends, citation analysis, and keyword mapping analysis using bibliometric analysis with Publish of Perish and VOS viewers software. The data used for this research is data that has been extracted from the Scopus online database. Not only using VOS viewers, researchers also use excel tables to classify publications and analyze mapping research. The results of the research discovered from the data used as many as 1640 articles and other databases, almost 99% of the languages used in publications use English, with the latest trends in the issue of the issue of articles published in almost 82.62% of the 1640 total articles that have been published on ESG. Then continued with the most popular topic is seen from the main keywords used, researchers present co occurrences analysis on author keywords, namely 685 total publications with a percentage of 41.77% are Sustainability Reporting, Sustainability (391). The limitation of this study is that it does not identify in detail the topic of current issues in each country that conducts research on ESG on sustainability reporting, so that the gap phenomenon of each environmental, social and profit issues that exist in each country is not identified. In addition, despite some limitations, sustainability reporting that has been observed also shows that ESG reporting plays a significant role in sustainability, particularly in terms of enhancing business performance This indirectly has implications for the validation of disclosures and will increase the trust of shareholders and key stakeholders. This study will enhance the development and understanding of the opportunities and possibilities of the latest literature on ESG in Sustainability Reporting and can find out the Gap in accordance with the current phenomenon. By analyzing the bibliometric and literature review related to ESG in Sustainability Reporting, This study is anticipated to be able to describe the literature review in detail and comprehensively, then obtain updates on current issues used by various countries, and will be able to connect with current phenomena with each sustainability report in different countries.

**Keywords:** Environmental; Social; Governance; Sustainability Reporting; Bibliometric Analysis

## 1. Introduction

Regulatory issues with the realization of sustainability reporting are still an important issue today (Rusmanto & Williams, 2015). Although ESG reporting and presentation is only voluntary (Lako, 2015), The statute for limited liability companies requires a report that presents environmental cost information. However, many ESG activities are carried out by the companies in order to be undistributed to those who really need it (Siregar et al., 2019). There is research to support this (Arjaliès & Mundy, 2013). It asserts that businesses will require information and data integration regarding external costs into corporate planning in order to manage risks in the face of stringent environmental rules. ESG should therefore be viewed as a legal requirement in addition to an ethical (Velentzas & Broni, 2010).

However, in South Africa, sustainability reporting is only treated as a In certain areas of the business, philanthropic responsibility, then the South African government is considered as an exclusive corporate social agent because everyone expects to establish significant social and economic initiatives to advance national community development (De Silva Lokuwaduge & De Silva, 2020).

Not only regulatory issues in the disclosure of sustainability reporting, but also there are environmental innovation issues that are very important in the framework of local industries because they can cause "double externalities" (Mazzanti & Zoboli, 2011). Where a company in the US focuses on developing new methods to minimize negative externalities, such as reducing and treating air emissions, waste in terms of cost and compliance with regulations (Brunnermeier & Cohen, 2003).

To achieve the ESG reporting expected by the company, the first thing to do is to understand the concept of ESG that there is concern for several elements. The first is profit, is basically the most important thing for the establishment of a company, second is the environment where the company must be responsible for the impact of the products produced so as not to cause the impact of externalities (Siregar et al., 2022), third is social where the company must be responsible to the community, and employees in the company.

The company's goal apart from Making a profit means adding value, and adding value that prioritizes social and environmental concerns over financial (Kompyurini, 2019). A control that can make social or ecological processes happen is consequently required. that are more directed so that the company's goals will be achieved. However, there are also people who argue that ESG only functions as a routine report, and only explicit performance (Kompyurini, 2019), because a lot of ESG fund distribution is not on target, consequently, oversight is required with the aim of acting morally toward ESG activities, which might be challenging to regulate at times (Feder & Weißenberger, 2021).

There are two models used in corporate social responsibility reporting: First, the analytical framework designed to comprehend the intricate relationships between human nature and socio-ecological systems. Second, the mode of transformation targeted at achieving sustainability. The sustainability report is divided into three dimensional categories. The first is environmental protection, which is described as human nature's connection with the environment, economy, politics, and environmental culture (Lemke, 2020). Furthermore, environmental sustainability—the idea that there exists a "natural world" unaffected by human activity—is attainable through environmental protection. In environmental protection, the natural world is the Earth's current environmental system that is purposefully maintained stable in order to support the growth of a community. The limitation of threshold values of ecological and Earth system processes' interdependence is the main topic of discussion (Lemke, 2020).

ESG is a part of business strategy (Welford & Gouldson, 1993), where the goal is to create tactics and strategies that are used for each market of the organization, then how each business will receive each strategy that has been planned. Then when viewed as an impact on sustainability reporting, ESG is act as a corporate responsibility, corporate accountability, corporate ethics and triple bottom line which will be related to corporate sustainability (Reinhardt & Stavins, 2010). With the development of ESG strategies for achieving transparent sustainability, which is easy for every stakeholder to read and understand, companies also strive to make these developments measurable with environmental innovation (Brunnermeier & Cohen, 2003). such as creating environmental protection strategies (Lemke, 2020), environmental cost impacts (L. Gao & Liu, 2021) , to how the use of innovative technologies used by companies (Mazzanti & Zoboli, 2011).

A lot of literature examines the impact of environmental innovation on sustainability reporting from the aspect of costs incurred. According to (Ramanathan et al., 2010) , that with the regulation and enviromental innovation that is needed by companies from a social perspective, it results in costs that have not been considered because the company must intentionally create negative externalities. However, there is no research that measures enviromental innovation with indicators of costs incurred in the cost structure for environmental development programs, where these costs have indeed been allocated by the company in operational costs.

Then the quality of sustainability reporting from the implementation of ESG disclosure programs or activities, environmental innovation and sustainability development will indirectly be seen and assessed. The environmental audit function is useful for improving the quality of information disclosure, which affects the company's perception of its accountability, thereby increasing stakeholder confidence (Mikial et al., 2019), Then, environmental audits are also carried out to monitor compliance with environmental laws and regulations related to environmental accounting and make recommendations related to environmental accounting procedures (Amin, 2014).

Environmental, Social and Governance Research in recent years, sustainability reporting has become increasingly popular. This is in accordance with the actions taken by stakeholders around the world who are continuously pressuring several companies to improve the accountability of sustainability reports (Bosi et al., 2022). However, state that there must be a regional relationship to develop a framework to support the consistency of reports to assist users in making decisions that are not only commercial considerations but also issues pertaining to the well-being of future generations.

However, not only the consistency of reports to help users make decisions, but also also ESG concepts and which knowledge is more prominent (Steblianskaia et al., 2023), So that it can increase the total publications in several regions, increase comparative analysis with several dimensions, analyze the development of ESG policy methods in several countries. Thus, it is expected that the development of ESG in providing a methodical foundation for development, sustainability reporting can assist scholars and professionals in navigating the literature on socially responsible investment (Losse & Geissdoerfer, 2021), by putting socially responsible investment into practice schemes, and how to calculate sustainability within the framework of investments that are socially conscious.

Furthermore, the ESG contribution will inspire academics to conduct research (Galletta et al., 2022), and the differences and comparisons are too high in fractionals and calculations. As a result, nothing differs. in substance between the two methods of counting the resulting data. Meanwhile, according to (Tuyon et al., 2022), there are three main domains used in ESG, specifically the consequences of sustainability, sustainable financial services, and sustainability

foundations and also argue that Sustainability Reporting is a synonym for Sustainability Development, SDGs, and CSR.

Thus, with the existence of different naming with the same purpose, the same model and framework that aims to benchmark sustainability practices related to ethics, sustainability governance, sustainability management (Tuyon et al., 2022). it is expected that in the future sustainability is not just a voluntary sustainability report, but rather a reflection of performance, policies towards sustainability innovations. Meanwhile (Jain & Tripathi, 2023) added that companies must generate value for stakeholders related to organizational policies and practices.

The purpose of this study is to describe the mapping of the Company's business activities to sustainability reports and how to implement them on ESG, with the hope that they will be able to take into account the interests of all parties involved, such as the environment in general, communities, investors, and employees (Galletta et al., 2022). There are several reasons to investigate the relationship between ESG Performance and Sustainability Reporting related to ESG issues.

The most important thing is that this research aims to investigate whether or not there is enough development of issues and approaches with several questions, namely the adequacy of the sustainability reporting framework, the basic concepts of sustainability, the development of sustainability until the change of the environmental, social and community paradigm to environmental and sustainability and governance. Literature is not enough to focus only on looking at several aspects of the perspective, such as how to consider the ESG dimension, let alone the latest issues regarding Greenwashing, Alphabet soup and lack of assurance. This research is distinct from previous research, because in this study will discuss the discovery of the gap, summary, analysis of the novelty of research and ESG in sustainability reports.

The research question development tools used in this research are using the PICO Framework (population, intervention, comparison and outcome) although the pico framework has several weaknesses, namely the pico framework tends to focus on the internal elements of the research question (population, intervention, comparison, and results).and can ignore relevant external context factors, but the pico framework helps researchers to identify the important elements in the research question, namely population, intervention, comparison, and outcome (Cleyle & Booth, 2006). With a clear focus, can be more focused and systematic, formulating more specific keywords and search parameters. This helps optimize search results and ensures the relevance of the articles included in the review, helps reduce bias in the review process, because clear and focused research questions can avoid selecting articles that are irrelevant or not in accordance with the research objectives. Re-search questions in this study are:

- a. What are the current and future trends in research issues regarding ESG On Sustainability Reporting?
- b. Which ESG papers have had the biggest impact on sustainability reporting ?
- c. Which ESG issue is most popular with sustainability reporting ?
- d. What is the most influential topic based on the latest cluster on ESG On Sustainability Reporting?
- e. What are the trends from various countries regarding ESG on Sustainability Reporting?

## **2. Research Methodology**

The method used in this research is bibliometric analysis to explore ESG development in sustainability reports and The approach used is tabulation of publications per year, author publications to citations, then continued with VOS viewer software (Carè & Weber, 2023). Additionally, using bibliometric analysis is able to transform qualitative information into quantitative information which will later emerge conclusions in the form of specific research quantities and topics (Bosi et al., 2022). And also assess the evolution, structure, and trends of ESG on Sustainability Reporting. Bibliometric analysis is more advantageous than ordinary journal reviews, this is because bibliometric analysis can examine several essential themes, presenting several reference points in addition (Benameur et al., 2023).

The stages used in this study are this analysis starting from the scope and feasibility of the research with the topic research ESG on Sustainability Reporting using Scopus data. This study includes strategies for discovering studies and articles related to Environmental, Social and Governance on Sustainability Reporting. This study focuses on the concepts and issues related to Environmental, Social and Governance on Sustainability Reporting, data screening, and how much research publication metadata. From the research obtained through the Scopus database, there are 1640 publications related to Environmental, Social and Governance On Sustainability Reporting.

After data has been retrieved, the extraction process will export the data in CSV and RIS formats. Then the next tool used is processing data into Microsoft excel and other test tools in the form of VOS Viewer and Harzings Publish of Perish software. The systematics of this research is divided into several parts, namely: introduction, literature review, data collection and methods used in this research, results and discussion, finally the conclusions and limitations of this research will be explained.

Detailed explanation of the descriptive analysis of Environmental, Social and Governance on Sustainability Reporting will be assessed in the results and discussion that were analyzed from Document Type, Source Type, Languages, Subject Area, Year of Publication, Total Publications and Citations by Year, Number of Author(s) per document, Top author's keywords, then continued with Co-authorship by author, Co-occurrence analysis of author's keywords, Citation analysis by documents, Citation analysis by sources, Network visualization map of the citation by authors, Network visualization map of the citation by countries.

### **2.1. Bibliometric analysis**

Bibliometric analysis is one of the techniques utilized in this study to identify research trends (Edition et al., 2019). When it comes to measuring text and information and analyzing published materials, bibliometrics is described as the application of statistical and mathematical approaches. It can also be used to track particular research trends that need to be investigated and to assess the volume and caliber of published material.

Then, it is able to fully display and explain publications by domain, location, country, and era through the use of bibliometric analysis. Furthermore, the bibliometric analysis approach method may comprehensively cover the publication-related data on Environmental, Social and Governance on Sustainability Reporting to be analyzed, including the authors, the quantity and frequency of citations on keywords (Edition et al., 2019). Therefore, bibliometric can chart the state of the art of the literature, then it can assess the growth and trend of research, with the illustration of publications in bibliometric form can see social structure and collaboration patterns, and can identify research gaps.

A range of metrics are employed to assess bibliometric analysis (Edition et al., 2019). investigates several elements, such as authorship, affiliation, publication type, and H index. Using data entered from the chosen database, this test tool generates several signs that describe the analysis. According to citation counts, citations per publication, effect per publication, and citation counts, some studies also address the impact of publications.

## 2.2. Past studies

**Table 1.** Summary of Previous Studies

Author	Domain/Search Strategy	Theoretical Framework	Finding	Limitation
(Bosi <i>et al.</i> , 2022)	“Environmental, Social,Governance” OR “Sustainability Reporting”	Stakeholder Theory	Analysis of trends related to ESG and SR emerged positively and evolved throughout the year.	Regional collaborations to provide a framework for uniform reporting that would help users make decisions on issues impacting not just business but also future generations' quality of life.
(Losse and Geissdoe rfer, 2021)	“Sustainable investment” OR “Responsible investing” OR “ESG Investing”	Stakeholder Theory)	This research can assist academics and practitioners to navigate the literature in socially responsible investment by presenting a systematic basis into the development of socially responsible investment.	How to measure sustainability within the framework of socially responsible investment and how to implement socially responsible investment.
(Galletta, Mazzù and Naciti, 2022)	“Financial institution” OR “Bank” OR “ESG Performance”	Stakeholder Theory) , Legitimacy theory	There are ESG contributions in the banking industry, and this will inspire academics to conduct research	There is too much difference and comparison in fractional and calculation. Therefore, there isn't much of a difference between the two approaches to counting the data that the study produced.
(Steblian skaia <i>et al.</i> , 2023)	“ESG” and “Firms” and “Stock” and “Value” and “social” and environmental’ and “risk”	Stakeholder Theory)	Bibliometric analysis can assist in seeing which ESG concepts and knowledge are more prominent.	Increase the total number of publications in several regions, increase comparative analysis with several dimensions and analyze the development of ESG policy methods in several countries
(Nilashi <i>et al.</i> , 2023)	Environmental, Social,Governance” OR “Sustainability Reporting”	Stakeholder Theory)	The findings indicate that the country barriers regarding implications, coordination, trade-off decisions and regional issues.	To be added to the electronic database

### 3. Result

#### 3.1. Trend pada Documents Profiles

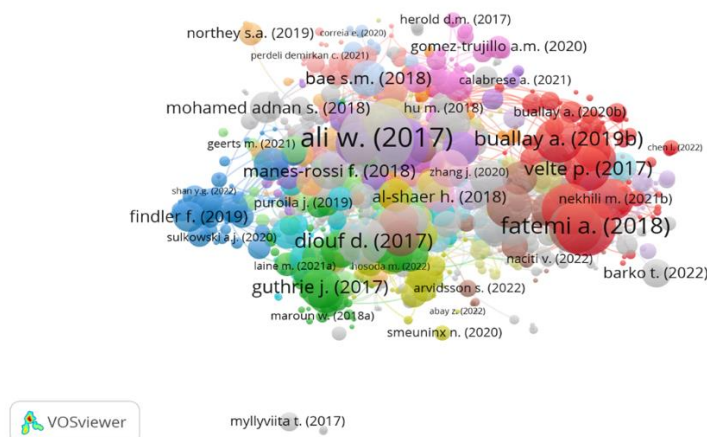
This research data obtained on March 1, 2023 and it was analyzed with several assessments including trend analysis, document type, and source type. From table 1, it can be concluded that there are 9 types of document regarding ESG on Sustainability Reporting with the highest total publications in the article document type as many as 1355 total publications or 82.62% of 1640 total publications, total Book Chapter publications of 139 or 8.48%, Conference Paper of 59 or 3.60%, Review of 58 or 3.54%, Book of 15 or 0.91%, Conference Review of 3 total publications or 0.18%, Editorial of 2 or 0.12% and the last total publication of Erratum of 1 or 0.06%.

**Table 2.** Document Type

Document Type	Total publication	Percentage
Article	1355	82.62%
Book Chapter	139	8.48%
Conference Paper	59	3.60%
Review	58	3.54%
Book	15	0.91%
Note	8	0.49%
Conference Review	3	0.18%
Editorial	2	0.12%
Erratum	1	0.06%

### 3.2. Citation Analysis

#### 3.2.1. Analysis of Citations by Documents



**Figure 2.** Map of the Network Visualization of Citations by Document

**Table 3. Trend in Source Type**

Source Type	Total Publication	Percentage (%)
Journal	1435	87.50%
Book Series	81	4.94%
Book	76	4.63%
Conference Proceeding	48	2.93%
Total	1640	100%

In addition, for the type of publication source, 87.50% comes from journals or as many as 1435 journals, then book series 81 total publications with a percentage level of 4.94%, followed by books with a total of 76 books or 4.63%, and finally Conference Proceedings with 48 publications or 2.93% of the number of publications on ESG on Sustainability reporting. It can be summed up that researchers at this time are very easy to find knowledge related to ESG sourced from the latest journals.

Table 3 shows that it is no longer a novelty that the most widely used language in writing documents and article sources is English at 99.09%. This result is appropriate since English is used as a universal language in current knowledge and publication standards. In other words, only a few contributions use languages other than English: Spanish (0.24%), Croatian (0.12%), Korean (0.12%), Portuguese (0.12%), Czech (0.06%) German (0.06%), Moldavian (0.06%), Romanian (0.06%).

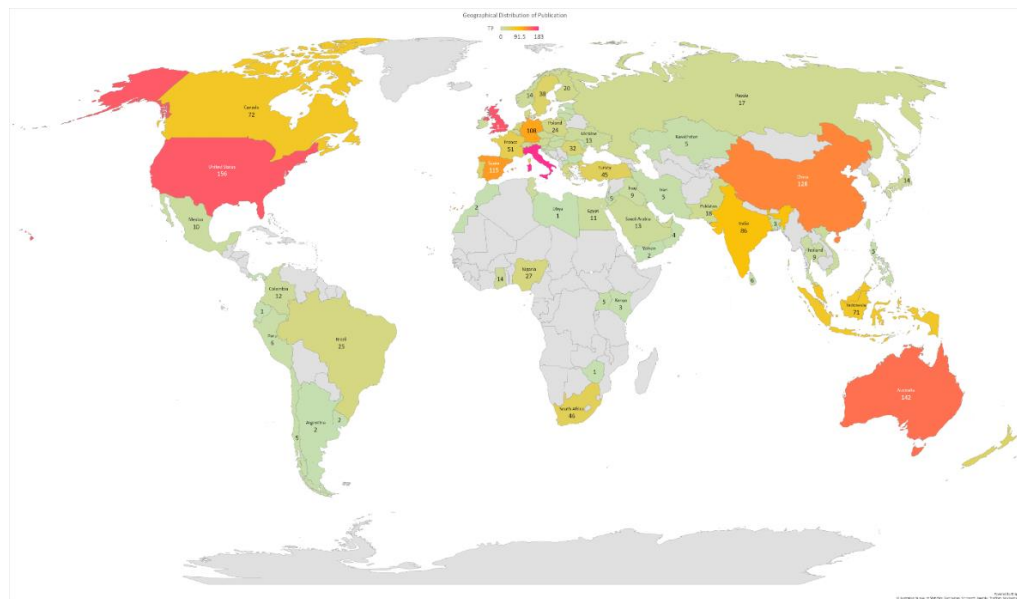
**Table 4. Languages**

Language	Total Publication	Percentage (%)
English	1628	99.09%
Spanish	4	0.24%
Croatian	2	0.12%
Korean	2	0.12%
Portuguese	2	0.12%
Czech	1	0.06%
German	1	0.06%
Moldavian	1	0.06%
Moldovan	1	0.06%
Romanian	1	0.06%
Total	1640	100%

Figure 3 indicates that since 2017 the phenomenon of ESG on Sustainability reporting has become the most trending issue, many countries around the world have conducted research because of the many issues of environmental issues, pollution, climate change, to Greenwashing, so that publications on ESG on Sustainability Reporting within 4 years have been widely researched in various countries. From the results of publication mapping, there are 183 publications or 11.16% of the most researched Italian countries, then followed by the United

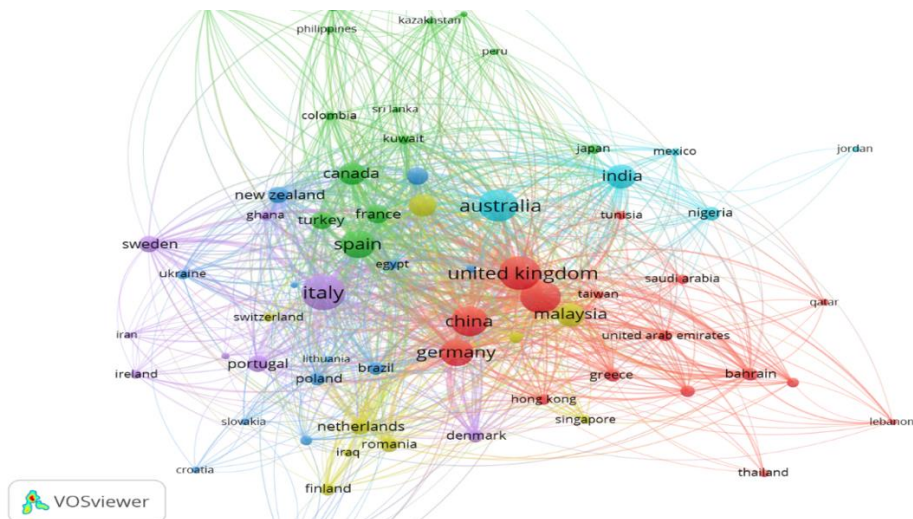


Kingdom 159 publications, United States (156), Australia (142), China (128), Spain (115), Germany (108), India 86, Malaysia (74), Canada (72), Indonesia (71).



**Figure 3.** Country Research Mapping

### 3.2.2. Citation Analysis by Countries



**Figure 4.** Network Visualisation Map of the Citation by Country

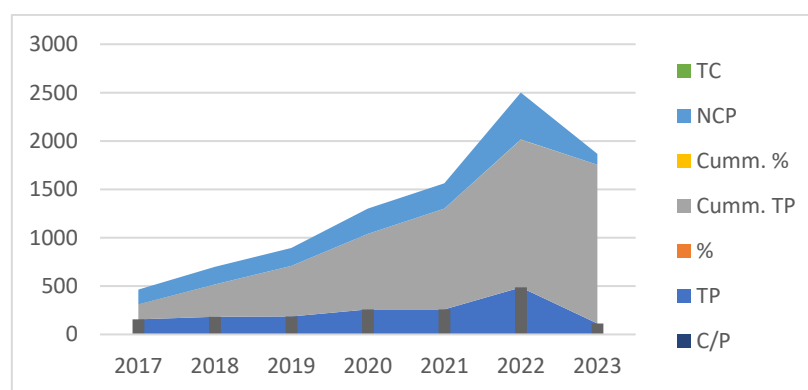
Generally, the mapping of ESG research and development on Sustainability Reporting in several countries is spreading, according to (Y. Gao et al., 2022), there is a positive correlation between countries that have environmental and ethical contributions of companies and local economic development, but in the era after the Covid pandemic there have not been many studies on how the policies and concepts of the ESG framework on Sustainability Reporting.

### 3.3. Publication trends

The trend of publications on ESG on Sustainability Reporting increases along with the many changes related to policies, strategies, activities, standards and ESG implementation frameworks. This can be proven by the publication table per year, from table 4 shows that from 2017 to 2023 publications on ESG On Sustainability Reporting fluctuate, meaning that publications per year are not the same, in 2017 (155), in 2018 (181), in 2019 (186), in 2020 (259), in 2021 (260), in 2022 (486), then in March 2023 (113), the publication data clearly shows that from 2020-2022 the issue of ESG On Sustainability Reporting is the most researched research topic, along with the G20 implemented in 2022.

**Table 5.** Year of Publication Trend

Row Labels	TP	%	Cumm. TP	Cumm. %	NCP	h-index
2017	155	9.45%	155	9.45%	155	155
2018	181	11.04%	336	20.49%	181	181
2019	186	11.34%	522	31.83%	186	186
2020	259	15.79%	781	47.62%	259	259
2021	260	15.85%	1041	63.48%	260	260
2022	486	29.63%	1527	93.11%	486	486
2023	113	6.89%	1640	100.00%	113	113
Grand Total	1640	100%			1640	1640



**Figure 5.** All Citations and Publications by Year

With the results of the publication trend related to the attention of the international community to the issue of ESG issues in Sustainability Reporting and environmental protection (Joshi & Gao, 2009). this is also evidenced by the emergence of Elkington's concept, then the standards used in measuring sustainability reports appear.

### 3.4. Publications by Source Titles

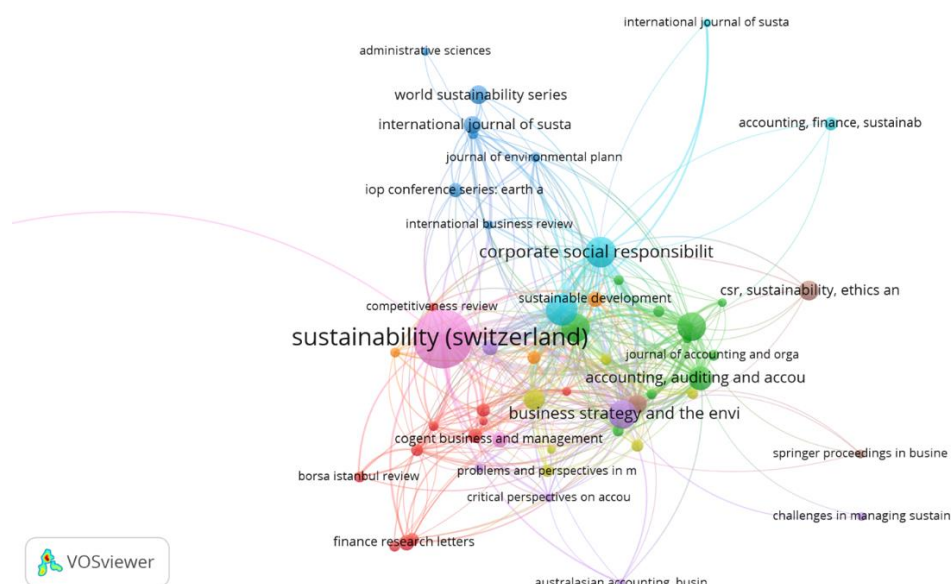
The most publications over the past seven years have been in the International Journal of Productivity and Performance Management (115 total publications with a citation rate of 3518), followed by the International Journal of Operations and Production Management (75 total publications with a total citation of 10248 documents) as shown in Table 5. International Journal of Operations and Production Management has published 62 times overall, totaling 1634 citations. Despite having fewer publications overall than the International Journal of Productivity and Performance Management, there have been a lot more citations.

**Table 6.** Most Productive Source

Journals	TP	NCP	TC	C/P	C/CP	h-index	g-index	m-index
International Journal of Productivity and Performance Management	115	107	3518	30.59	32.88	35	55	0.0290
International Journal of Operations and Production Management	75	73	10248	136.64	140.38	43	75	0.0345
Measuring Business Excellence	62	57	1634	26.35	28.67	24	39	0.0281
International Journal of Business Performance Management	47	44	828	17.62	18.82	14	27	0.0171
Production Planning and Control	39	35	1473	37.77	42.09	23	38	0.0465
International Journal of Production Research	39	38	2366	60.67	62.26	25	39	0.0491
Management Accounting Research	35	34	3566	101.89	104.88	27	35	0.0462
Public Money and Management	35	35	835	23.86	23.86	15	28	0.0209
International Journal of Production Economics	35	35	4544	129.83	129.83	27	35	0.0450
Total Quality Management and Business Excellence	24	22	411	17.13	18.68	14	20	0.0428
Benchmarking	23	22	1828	79.48	83.09	14	23	0.0515
Management Decision	21	21	912	43.43	43.43	14	21	0.0420
Studies in Managerial and Financial Accounting	21	15	56	2.67	3.73	4	6	0.0159
Accounting, Organizations and Society	20	19	3332	166.60	175.37	17	20	0.0644

Public Performance and Management Review	19	19	298	15.68	15.68	11	17	0.0588
Financial Accountability and Management	17	16	611	35.94	38.19	13	17	0.0556
Advances in Management Accounting	16	14	81	5.06	5.79	5	8	0.0244
Decision Management: Concepts, Methodologies, Tools, and Applications	15	1	1	0.07	1.00	1	1	0.0095
Business Process Management Journal	15	15	626	41.73	41.73	11	15	0.0512

### 3.4.1. Citation analysis by source



**Figure 6.** Citation Network Visualisation Map Based on Source Titles

### 3.5. Citation Metrics

Citation metrics are metrics used to see a summary of citation analysis that is used for evaluation (Bosi et al., 2022), Using publish or perish software that produces data that will generalize the Scopus database. The table shows that there are several metric indicators, namely the number of articles during the observation period, citation, number of articles, total citations, authors, h index, g index. So far, research conducted from 2017 to March 2023, there are 1640 articles related to ESG issues and phenomena in Sustainability Reporting that have been published in the Scopus database.

During the 6-year observation period there were 20528 articles cited with an average annual citation of 3421.33 publications. In addition, the table shows that the average citation

per author is 8738.3 with an average citation per article of 12.52 and author per article of 2.84. Then the results of this metrics data also show that the overall h index is 64 and the g index is 92.

**Table 7.** Citation metrics

Metric	Data
Papers	1640
Citations	20528
Years	6
Cites_Year	3421.33
Cites_Paper	12.52
Cites_Author	8738.3
Papers_Author	739.34
Authors_Paper	2.84
h_index	64
g_index	92

### 3.6. Top Keyword

In the development of top keywords using tables and bibliometric network visualization, this approach uses a method in the form of Top author's keywords derived from the form of nodes and connecting lines between keywords related to ESG and Sustainability Reporting. From the connecting data, VOS Viewer software is introduced for alternative, better mapping analysis and used to visualize the relationship between keywords. In the software there are three different events in data visualization, namely network visualization, overlay visualization and density visualization.

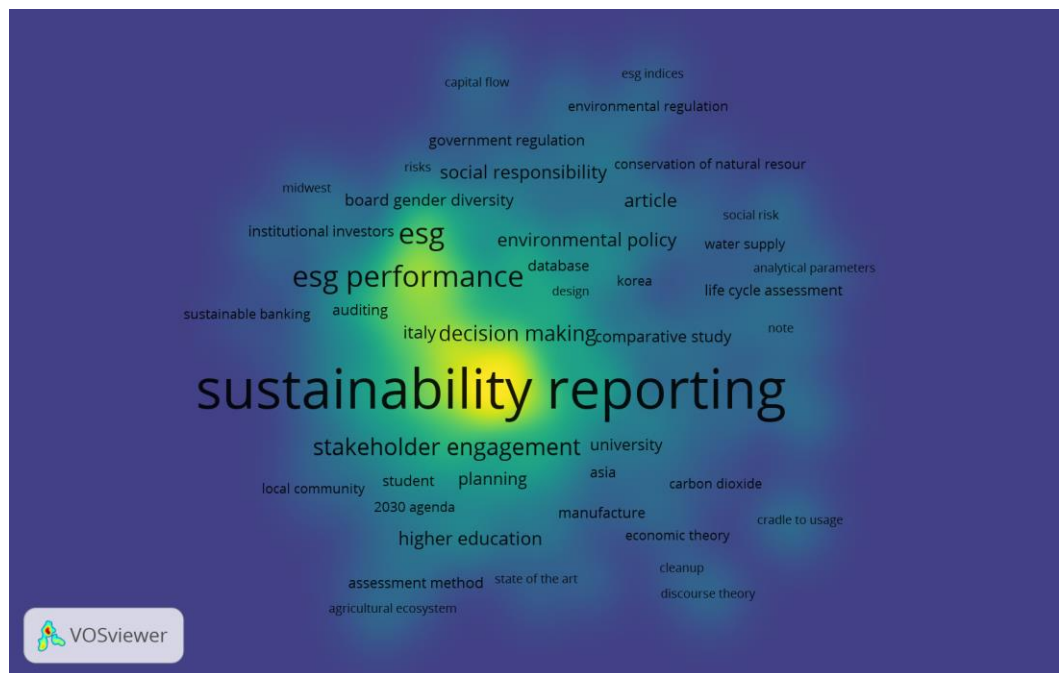
To identify the main keywords used, the researcher presents co-occurrences analysis on author keywords related to ESG on Sustainability Reporting, 685 total publications with a percentage of 41.77% are Sustainability Reporting, Sustainability (391), Sustainable Development (244), Corporate Social Responsibility (218), ESG (124), ESG Performance (115), Integrated Reporting (98), Corporate Governance (97), Stakeholders (96), Global Reporting Initiative (84), Governance Approach (75) are the dominant keywords, just like the keywords used by (Nilashi et al., 2014). , 2023)

This answers the first research question regarding how the issue trends are developing at this time. Where the keywords used are not only on sustainability reporting or ESG, but there are still many keywords related to each other.

**Table 8.** Top Author's Keyword

Author Keywords	Total Publikasi	Percentage (%)
Sustainability Reporting	685	41.77%
Sustainability	391	23.84%
Sustainable Development	244	14.88%
Corporate Social Responsibility	218	13.29%
ESG	124	7.56%
ESG Performance	115	7.01%
Integrated Reporting	98	5.98%
Corporate Governance	97	5.91%
Stakeholder	96	5.85%
Global Reporting Initiative	84	5.12%
Governance Approach	75	4.57%
Content Analysis	67	4.09%
GRI	63	3.84%
Financial Performance	59	3.60%
Accountability	58	3.54%
Stakeholder Engagement	57	3.48%
Stakeholder Theory	57	3.48%
Environmental	52	3.17%
Sustainability Report	52	3.17%

Then it is indicated by overlay visualization in figure x illustrating the 10 largest keyword clusters and the results obtained are sustainability reporting which is the most popular keyword and can explain this research is a research trend at this time, then followed by sustainability development, ESG, CSR, integrated reporting, environmental economics, corporate governance. Regarding the novelty of the keywords used, it can be seen from the yellow circle of environmental economics, integrated approach, environmental sustainability.

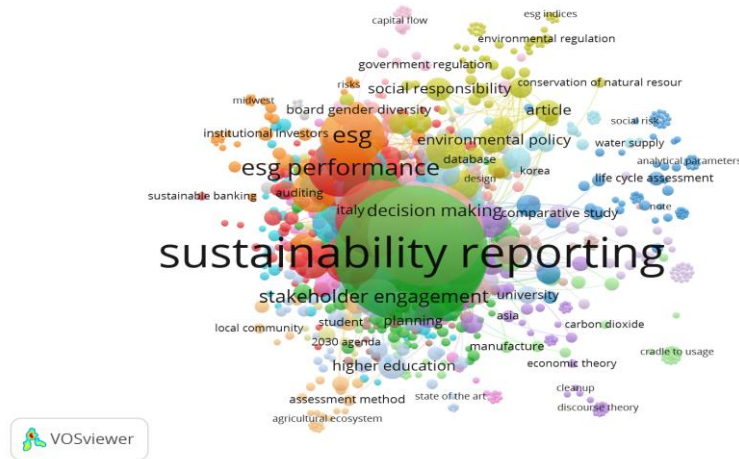


**Figure 7.** Density visualisation of the author’s keywords

### ***3.6.1. Analysis of co-occurrence***

#### ***3.6.1.1. Keyword of co-occurrence analysis for the author***

To determine future research that directly relates to ESG in sustainability reporting, it can be analyzed with Co-occurrence analysis of author's keywords and trend topics of the theme under study. Keywords are a refined introduction to academic articles. By examining the author's keyword co-occurrence analysis, scholars can directly comprehend and interpret the relationship of further research. In this research, Co-occurrence analysis of author's keywords shows using four keywords with a total of 4453 analyzed keywords with 1000 selected keywords.



**Figure 8.** Network Visualisation of the Author’s Keywords

The size of the nodes contained in the Network visualization of the author's keywords is indicated by the number of keywords used. Meanwhile, the strength of co-occurrence between keyword pairs is determined by the relationship between two related nodes. The color of the circle indicates keyword clusters, with the frequency associated with word co-occurrence and can be shown as a research topic (L. Gao & Liu, 2021).

Cluster 1: in this first cluster (red cluster) shows that ESG performance is related to sustainability reporting, corporate governance, investment and China, meaning that many ESG Performance studies in China use these keywords, then ESG performance is related to investment covid 19, followed by research in the green cluster by linking ESG performance with corporate governance and sustainability reporting. As for the other clusters, this research is the main topic and is related to social responsibility, environmental policy, China and the United Kingdom.

Cluster 2: the topics discussed in this cluster (green cluster) are focused on sustainability reporting, Italy decision making, crade to usage, economic theory, stakeholder engagement, social and environmental accounting, environmental management, triple bottom line, ESG rating, social sustainability, philosophical aspects, environmental performance measurement, environmental technology, action research, supply chains, sustainability policy, regulatory compliance, sustainability assessment, quality management, budget control, corporate governance, tourism development, integrated thinking, green greenhouse gases,

Cluster 3: on the topic of this cluster (blue cluster) shows that in some developing countries, Australia, Portugal, research related to the environmental sustainability, water management, water conservation, social problems, water supply, recycling, water use, social risk, mining, energy, social life cycle, automobile industry, risk, bioenergy, carbon footprint, priority journal. The existence of this cluster shows that the linkage of sustainability reporting strongly influences the supporting variables.

Cluster 4: in this cluster (yellow cluster) as viewed from the country of china network ties with regulatory framework, green finance, controlled study, environmental protection, human, environmental policy, social responsibility, environmental economics, while the



relationship to other clusters china is related to ESG, while environmental policy is related to its network with regulatory framework, human, china, environmental economics, and links with other clusters between environmental policy innovation and sustainability, while environmental protection is directly related to sustainability reporting and conservation of natural resources.

Cluster 5: in this cluster (Purple cluster) shows several points such as corporate strategy, economic development, business development, corporate sustainability, benchmarking, strategic approach, supply chain management, biodiversity, energy utilization, economic theory, social aspects, legitimacy theory, corporate environmental, America, business, Brazil, human rights. When viewed from the network linkage of corporate strategy is closely related to economic development, strategic approach, while when associated with other clusters corporate strategy is related to sustainability reporting, environmental economics, CSR, corporate governance, environmental management. It can be concluded that Sustainability reporting does not only present reports but is implemented with strategy strategies that will improve report performance.

#### **4. Discussion**

Sustainability reporting is defined as voluntary sustainability reporting, however the issue of sustainability began with many stakeholder and government strategies in following up on sustainability issues that began to have an impact on society, the environment and the company's finances. Sustainability activities that are carried out start from corporate social responsibility, sustainability development goals to the current environmental, social and sustainability. These activities and strategies have one goal, which is how every stakeholder is able to carry out and present and later be accountable for every activity that has an impact on society and the environment. This statement is aligned with (Jain & Tripathi, 2023) which states that the existence of sustainability goals will bring ESG reporting to a broader direction for stakeholders, investors, financial institutions and auditors.

Answering the first research question regarding the latest trends in research issues regarding ESG On Sustainability Reporting is more to do with ESG performance in the banking sector, and what are the risks to ESG performance and not to the risks of sustainability reporting, and how is the relationship between sustainability reports on corporate audit quality. Meanwhile regarding the future regarding ESG On Sustainability Reporting is the external risk of the resulting product impact, the risk of climate change that should be implemented in the company's sustainability report and how innovation can improve the Company's image through sustainability reports so as to ward off investors' views of greenwashing actions.

Followed by the type of publication source 87.50% originated from journals or as many as 1435 journals, then book series 81 total publications with a percentage level of 4.94%, followed by books with a total of 76 books or 4.63%, the last Conference Proceedings of 48 publications or 2.93% of the number of publications on ESG On Sustainability reporting, it can be concluded that researchers at this time are very easy to find knowledge related to ESG sourced from the latest journals. The writing of documents and article sources is in English by 99.09%. This result is appropriate since English is used as a universal language used in knowledge and publication standards that apply today. In other words, only a few contributions use languages other than English: Spanish (0.24%), Croatian (0.12%), Korean (0.12%), Portuguese (0.12%), Czech (0.06%) German (0.06%), Moldavian (0.06%), Romanian (0.06%).

When referring to the most influential publishers in articles on Environmental, Social and Governance on Sustainability Reporting, a lot of top publication information is obtained,

With 117 total publications and a citation rate of 3518 over the past seven years, the International Journal of Productivity and Performance Management has published the most. It is followed by the International Journal of Operations and Production Management, which has published 75 total publications and 10248 total citations. International Journal of Operations and Production Management has published 62 times overall, totaling 1634 citations. Although the total publications are less than the International Journal of Productivity and Performance Management, the citations obtained are enormous.

Furthermore, the most popular topic regarding Environmental, Social and Governance on Sustainability Reporting is seen from the main keywords used, the researcher presents co-occurrences analysis on author keywords related to ESG on Sustainability Reporting, 685 total publications with a percentage of 41.77% are Sustainability Reporting, Sustainability (391), Sustainable Development (244), Corporate Social Responsibility (218), ESG (124), ESG Performance (115), Integrated Reporting (98), Corporate Governance (97), Stakeholder (96), Global Reporting Initiative (84), Governance Approach (75).

The growth of publications on ESG on Sustainability Reporting is in accordance with the many changes related to ESG policies, strategies, activities, standards and implementation frameworks. This can be proven by the publication table per year, table 4 shows that from 2017 to 2023 publications on ESG On Sustainability Reporting fluctuate, meaning that publications per year are not the same, in 2017 (155), 2018 (181), 2019 (186), 2020 (259), 2021 (260), 2022 (486), then in March 2023 (113), the publication data clearly shows that from 2020-2022 the issue of ESG On Sustainability Reporting is the most researched research topic, along with the G20 implemented in 2022.

The last research question is the trend of countries conducting research on Environmental, Social and Governance on Sustainability Reporting, shown by the phenomenon of ESG on Sustainability reporting being the most trending issue, many countries around the world conduct research because of the many issues of environmental issues, pollution, climate change, to greenwashing, so that publications on ESG on Sustainability Reporting in a period of 4 years are widely researched in various countries. From the results of publication mapping, there are 183 publications or 11.16%, Italy is the most researched country, followed by the United Kingdom 159 publications, United States (156), Australia (142), China (128), Spain (115), Germany (108), India 86, Malaysia (74), Canada (72), Indonesia (71).

Consequently, this research contributes to management accounting, where users of management accounting information are not only internal scope, but have become the needs of investors and other stakeholders, then related to the issue of sustainability reports not being a volunteer report only, but it will require a separate presentation of information and the involvement of internal auditors in presenting, reporting and assessing sustainability reports in the future.

#### **4.1. Limitations of the Present Study**

Future research related to the limitations of the study The most important thing is that ESG on Sustainability reporting has a development framework in the form of a policy that requires every company, so that later this reporting is not only used as a good name identity, or complement the needs of the environmental ministry procedures. However, the development framework for ESG on sustainability reporting is expected to consistently assist users or companies in making decisions based on the scope of the environment, social and profit.

## 5. Conclusion

This research focuses on 1640 publications extracted from the Scopus database related to ESG on Sustainability Reporting, data taken from 2017 to March 2023, from the results of the data obtained in 2022 the topic of ESG on Sustainability Reporting is the most researched. Our key findings will be discussed as follows: first, the analysis of current trends on the issue of research issues regarding Environmental, Social and Governance on Sustainability Reporting is always changing along with the many strategies and activities carried out, then with the existence of applicable policy policies. This is confirmed by the articles published in almost 82.62% of the 1640 total articles that have been published on ESG.

The limitation of this study is that it does not identify in detail the topic of current issues in each country that conducts research on ESG on sustainability reporting, so it is not known the gap phenomenon of each environmental, social and profit issues that exist in each country. In addition, despite some limitations, the sustainability reporting studied also shows that ESG on sustainability reporting has an important role, especially to improve company performance. This indirectly has implications for the validation of disclosures and will increase the trust of shareholders, and key stakeholders.

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