International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 10 No. 4, 2024 https://www.theaspd.com/ijes.php

Environmental, Social and Governance Considerations into Investment Decisions: Current State and Future Directions

[1]Aishwarya, [2]Dr. Rachana Vishwakarma, [3]Saket Mishra

[1]Research Scholar, Department of Commerce and Business Studies, Central University of South Bihar, Gaya, Bihar, Email id: aishwarya.50030@gmail.com

[2]Assistant Professor, Department of Commerce and Business Studies, Central University of South Bihar, Gaya, Bihar, Email id: rachana.job88@gmail.com

[3]Research Scholar, Department of Commerce and Business Studies, Central University of South Bihar, Gaya, Bihar, Email id: mishrasaket560@gmail.com

Abstract

The increasing global emphasis on sustainable development, both inside and outside the organization has led to the adoption of Environmental, Social and Governance (ESG) factors into business practices. The stakeholders are now increasingly incorporating ESG aspects into their investment decisions to achieve long-term returns and move closer towards sustainability. Research on ESG practices has increased over the past two decades, however the overview of the topic is still insufficient. Therefore, to understand the current state of the ESG practices, this study reviews and summarizes a corpus data of 2,434 documents on ESG literature focusing on ESG investments, published from 1991 to 2024, which were retrieved from Scopus database. The analysis was performed using VOS Viewer and Bibliometrix package by R software, which provides a graphical representation of the data. This study provides a comprehensive overview of current state of ESG literature by emphasizing on the emerging areas and trends in publications, most occurring keywords, prominent authors, citation and co-citation analysis, co-authorship analysis. The limitation of using only a single database for collecting and analyzing the data is acknowledged which also adds up for the future research. This study enhances the review quality by pointing the researchers towards the future research directions in the area of ESG.

Keywords: *Bibliometric analysis, Decision making, ESG, Firm Performance, Investments, Sustainable development.*

1. INTRODUCTION

Sustainable development is a comprehensive strategy for growth that seeks to meet present needs without jeopardizing the ability of future generations to meet their own needs (Bruntland et al., 1990). The term "sustainability" was first defined by the United Nations Brundtland Commission in 1987 in their book "Our Common Future" and since then, its meaning has grown to include about 300 terms (Johnston, 2007). It is essential as it balances the present requirements with those of future generations, guaranteeing environmental preservation, economic stability, and social welfare. It promotes resilient economies by facilitating long-term economic growth and the optimal utilization of resources. It also underscores social fairness, poverty alleviation, and access to fundamental services. Moreover, it enhances resilience against environmental, economic, and social catastrophes while promoting

[1] Aishwarya, Research Scholar, Department of Commerce and Business Studies, School of Management, Central University of South Bihar, SH-7, Gaya-Panchanpur Road, 824236, Bihar, India, Ph. No. – 9905629005, Email id: aishwarya.50030@gmail.com

[2] Dr. Rachana Vishwakarma, Assistant Professor, Department of Commerce and Business Studies, School of Management, Central University of South Bihar, SH-7, Gaya-Panchanpur Road, 824236, Bihar, India, Ph. No. – 9454614028, Email id: rachana.job88@gmail.com

[3] Saket Mishra, Research Scholar, Department of Commerce and Business Studies, School of Management, Central University of South Bihar, SH-7, Gaya-Panchanpur Road, 824236, Bihar, India, Ph. No. – 8229088789, Email id: mishrasaket560@gmail.com

intergenerational justice. Therefore, sustainability is preserving the integrity and health of natural systems while maintaining or improving the quality of human existence (Harris, 2003).

When sustainability is seen from the finance lens, the concept of sustainable finance or sustainable investing emerges. According to the World Bank, "Sustainable finance is the process of taking due account of environmental, social and governance (ESG) considerations when making investment decisions in the financial sector, leading to increased longer-term investments into sustainable economic activities and projects." The study of maximizing social returns or value-added activities with considerable externalities or repercussions impacting many generations (inter-temporal perspective) and many societal segments (intra-temporal perspective) may need to be revised to be included in the fundamental economic model of private-profit maximization. Challenges in appropriately including external benefits and costs into private-profit maximization calculations may lead to insufficient investment in such activities (Buchanan & Stubblebine, 1962). Furthermore, the private returns-only strategy can be limited from a moral perspective because it appears to be ethically neutral and ignores specific broader dimensions of human well-being. In this context, the idea of "sustainable economic development" aims to go beyond the limitations of popular economic models and include more expansive definitions of economic prosperity tied to social and environmental values (Barbier, 1987). This may involve directing the investment to change the trajectory of economic development. The investment that contributes to the achievement of a sustainable growth trajectory is Socially Responsible Investments (SRI) (Ziolo et al., 2017). SRI is an investment approach that evaluates financial returns and social or environmental benefits. Investors engage in SRI select firms, organizations, or funds that correspond with their ethical principles and foster beneficial societal results. This method evaluates prospective investments according to multiple factors, including environmental sustainability, social equity, corporate governance, and ethical business conduct.

According to the 17 sustainable development goals (SDGs) set forth by the UN, all people should have access to more economic opportunities, improved health, and a cleaner environment by 2030. UNCTAD estimates that an annual investment between US$5 trillion and US$7 trillion will be required to reach the aim. Particularly in developing economies, there is still a sizable investment vacuum that cannot be filled by the government, development agencies, and other multilateral institutions working together at their current level (Mishra et al., 2023). Only 7.76% of the world's total assets under management (AUM) must be mobilized annually to finance the SDG's realization (United Nations Development Programme, 2018).

"ESG investing" describes how businesses perform regarding these standards and responsibility measures for possible investments (Friede et al., 2015). Environmental standards evaluate an organization's efforts to protect the environment. Social criteria assess how it handles relationships with societies, suppliers, customers, and employees. Governance encompasses a company's internal controls, leadership, executive compensation, audits, and shareholder rights. ESG criteria, in particular, are data-driven parts of sustainability that highlight how well a business performs in the quantifiable domains of the environment, society, and governance (Khan et al., 2015). The environmental pillar of ESG tackles essential environmental issues such as waste management, carbon footprint, resource utilization, and hazardous emissions (Jasch, 2006). The governance pillar primarily deals with policy planning, personnel management, company ethics, and corporate social responsibility, and the social pillar concentrates on important societal factors, including workforce management, human rights, and community issues (Sullivan & Mackenzie, 2017).

ESG investing is a powerful tool that can help in addressing issues like promoting sustainable growth by giving importance to environmental and social factors, attracting foreign investment as the demand for ESG-based investments is on the rise, promoting ethical practices as ESG investing, encouraging companies to adopt ethical business practices, enhancing risk management by helping in identifying and mitigating the risk associated with environmental disasters, social unrest, and corporate issues (Gibson & Krueger, 2017).

Due to investor demand, governmental support, and the realization of economic prospects, ESG investing is rapidly expanding in the world. It has the potential to significantly improve the environment, society, and corporate governance practices as the nation works collectively toward sustainable

development. The world together can set the standard for a sustainable future that strikes a balance between financial rewards and the welfare of society and the environment by adopting ESG investing. The document advances as follows. Section 2 constitutes the literature review, presenting a compilation of Environmental, Social, and Governance aspects as articulated by many authors in their publications. Section 3 of this report formulates and presents research questions to discover gaps and possibilities. Section 4 delineates the research objectives. Section 5 discusses the methodology including study design and sample chosen to be employed in this investigation. Section 6 presents the data, while Section 7 delineates the conclusion and limitations. At the end Section 8 emphasizes on the future research directions.

2. LITERATURE REVIEW

2.1 ENVIRONMENTAL ASPECT OF ESG

According to Dragomir (2020), the "E" aspect of ESG leads to the question, "How does a company's behavior affect the environment?" Jianping et al. (2014) described essential aspects of environmental issues like global warming, lack of freshwater resources, loss and destruction of the ozone layer, water and soil pollution, a decline of biological diversity, land desertification, sharp fall of forest cover, and acid rain as the leading global environmental issues in their study. In contrast, Senadheera et al. (2021) examined issues pertinent to organizational management, including the management of water and essential resources, reliance on fossil fuels, pollution levels, hazardous waste production and disposal, climate change, and carbon footprint, as these elements could impact a company's financial viability and long- term sustainability. On the other hand, Chatzitheodorou et al. (2019) highlighted various environmental components of ESG, specifically green energy, water conservation, biodiversity preservation, rainfall harvesting, climate change activities and Rooh et al. (2023) support the same aspects of clean energy in the form of Climate change, energy consumption, and water management. Trahan and Jantz (2023) observed four main components to fix the "E" pillar of ESG: (A) carbon emissions are a cause of climate change; (B) The sources of carbon emissions are easily identified and may be measured; (C) To achieve the globally acknowledged decarbonization objective, certain economic sectors, like transportation and electric utilities, must significantly diminish their emissions, while other sectors are exempt from this requirement which can be demonstrated by the math involved in carbon reduction; (D) One way to ensure the technological advancement required to reach decarbonization targets is through faster substitution through social adoption of specific technologies. The environmental factors deal with the characteristics of the climate and environment within the characteristic framework and how they operate. These include greenhouse gas emissions, water and air pollution, waste management, energy efficiency, and climate change (PRI, 2015). Chiromba (2020), in his paper, focused on the level to which the different aspects of environmental factors have affected the environment like the Level of Environmental Degradation, the Level of Natural Resources Depletion, and the Level of Uncontained Waste Output as environmental factors. In the current scenario, the COVID-19 pandemic has also created environmental problems with the production of hazardous and medical wastes, how to dispose of them, and the rise in the use of private transportation, which raises carbon emissions (Barouki et al., 2021).

2.2 SOCIAL ASPECT OF ESG

Becchetti et al. (2022) in their paper identified different reporting and ranking providers namely MSCI, Vigeo Eris, Refinitiv, ISS Oekom, ECPI, Bloomberg, FTSE Russell, Reprisk and different dimensions of "S" given by those ranking providers namely product liability, human capital, stakeholder requirements, social prospects, human resources, human rights, community engagement, product accountability, workforce, community, product responsibility, equal opportunities, freedom of association, health and safety, social impact of product, taxes, employees and human capital, community relations, markets, corporate governance and shareholder, political contribution, discrimination, diversity, community relations, labor standards, customer responsibility, forced labor, child labor, collective bargaining, discrimination in employment, occupational health and safety issues, poor employment conditions, human rights abuses and corporate complicity, impacts on communities, local participation issues, social discrimination. The aspects mentioned by Chiromba (2020) mainly focused on the hazardous activities that may harm society, such as the corporation's engagement in weapon

manufacturing and the development of health-detrimental products, and promotes companies' participation in positive community projects and promotion of cultural diversity. In their study, Sultana et al. (2018) mentioned fair trade safety and philanthropy as the "S" aspects of ESG. Parikh et al. (2023) mentioned the aspects given by Chartered Financial Analyst (CFA) in their study, which included customer happiness, data protection and privacy, gender and diversity, community relations, rights for human, and labor regulations in social issues for measuring ESG performance. Jonwall et al. (2023) considered basic human welfare requirements like human rights, community service, customer protection, employee rights, and gender equality to be social issues in their paper.

2.3. GOVERNANCE ASPECT OF ESG

Ahmad et al. (2023) in their study included different factors of governance as mentioned by different indices, namely Bloomberg (Executive remuneration, Rights of shareholders, Staggered boards, independent directors, Cumulative voting), Thomson Reuters (Corporate governance, corporate behavior), MSCI (Management, Shareholders, CSR strategy). On the other hand, Chiromba (2020) considered only those factors associated with the board of directors like Board and Management Discipline, Transparency of Company Information (Disclosure), Accountability of the Board, Management, and independence of the board of directors. Other than these factors, Sultana et al. (2018) mentioned Corruption and Bribery as the "G" factors of ESG, whereas Parikh et. Al (2023) used the aspects mentioned by Chartered Financial Analyst (CFA), like composition of board, audit committee structure, corruption and bribery, executive remuneration, lobbying, political contribution, and whistleblower programs of the firms. According to Bae and Goyal (2010) investors prefer firms with a high degree of foreign ownership, pay higher dividends, and whose biggest shareholder has eminent influence over cash flow rights, so these companies purportedly have more robust governance standards. Numerous other studies have shown that critical elements of good governance include conformity with accounting standards, auditor independence, management quality, a strong board with clearly defined roles and responsibilities, and shareholder rights (e.g., Sood et al., 2023; Al-Hiyari & Kolsi, 2021; Park & Jang, 2021; Sultana et al., 2018).

From the above literature, it was discovered that most of the studies related to ESG in sustainable finance focused on reporting sustainable activities in the form of disclosures. Based on company performance, many studies have been conducted. However, few studies have been done when looking through the investor's perspective and their investment decisions regarding ESG. There is a need to explore this area and identify the trends and emerging themes. A bibliometric analysis was performed in this study to identify emerging trends and themes. As per our knowledge, this study is one of its kind exploring the ESG investing area, finding the emerging themes and suggesting future research directions.

3. RESEARCH QUESTIONS

To identify the gaps and opportunities related to ESG in sustainable finance, the subsequent research questions were formulated:

1. What are the most influential research topics related to ESG for sustainability?
2. How has the collaboration among authors evolved?
3. What are the under-explored and over-explored concepts related to ESG and investment decisions, as indicated by word cloud and co-word analysis?

4. RESEARCH OBJECTIVES

In accordance with the aforementioned research questions, the subsequent objectives for this study are:

1. To find out the annual scientific production and most prominent words related to ESG in sustainability.
2. To identify the emerging themes in the area of ESG investing.
3. To uncover the sustainability-related ESG trends through bibliographic coupling, citation analysis, and co-authorship analysis.

5. METHODOLOGY

5.1 STUDY DESIGN

This review paper employs a bibliometric approach for analyzing the landscape of academic research on ESG in sustainable finance. This approach offers a systematic approach in identifying trends and synthesizing extensive material. Bibliometric analysis is a popular and reliable quantitative technique for examining and evaluating a large amount of scientific material which aims to understand the relationships between journal citations and provide an overview of a rising research topic's present state of affairs (Donthu et al., 2021). Combining the most representative results from bibliographic documents is commonly done through bibliometrics (Martinez-Lopez et al., 2018).

In a bibliometric analysis, a collection of related papers is examined using a number of bibliometric identifiers to give an overview of a specific field of study. According to Carlsson et al. (2017), bibliometric analysis mainly uses publication statistics and the number of citations which works as a gauge of scientific output and influence. It illustrates a certain scientific field's organization and main ideas, as well as new developments and potential directions for further study. Therefore, using bibliometric analysis, which includes performance analysis, science mapping, and network analysis, the current study determines the main trends in ESG research (Jain & Tripathi, 2023).

5.2 DATA COLLECTION

5.2.1 PRISMA FRAMEWORK

The PRISMA framework comprises of three main steps that involves (1) Identification, (2) Screening and (3) Inclusion. In the identification process, the authors identify the relevant documents to be used in the analysis process using a search string comprising the keywords related to a topic. For conducting this analysis, Scopus database was used to retrieve the data using the specified keywords search: "ESG" OR "Environmental Social Governance" OR "Sustainability" AND "Investors" OR "Investment Decisions." A total of 5,877 documents were identified using this keyword search string. After the corpus data is identified, additional limits were added to make the data more comprehensive and refined. The limits like time frame, subject area, language, document type were used. The time limit of 1991 to 2024 led to no changes in number of documents; employing the subject area (business, management and accounting economics, econometrics, finance) resulted in a total of 2,484 documents. By selecting the document type as article only and language as English significantly decreased the number of documents to 2,474. The application of all the limits resulted in a total of 2,474 publications for further analysis. In the next step i.e. screening process, the duplicate, missing or incomplete documents are removed. During this process 40 records were found to be incomplete which were then removed from the sample to be used for the analysis. The final sample resulted in a total of 2,434 documents which were then imported in a CSV file to be used by the software to visualize and analyze the trends, networks, and citations in bibliometric form. The analysis included annual scientific production and word cloud which were created using the Bibliometrix package by R software, and science mapping analysis of the dataset was done through bibliographic coupling, co-occurrence of keywords, citation network, and co-citation network of documents using Vos viewer. Fig. 1 below shows the identification, screening and inclusion process used in this study to collect the data for the purpose of analysis.

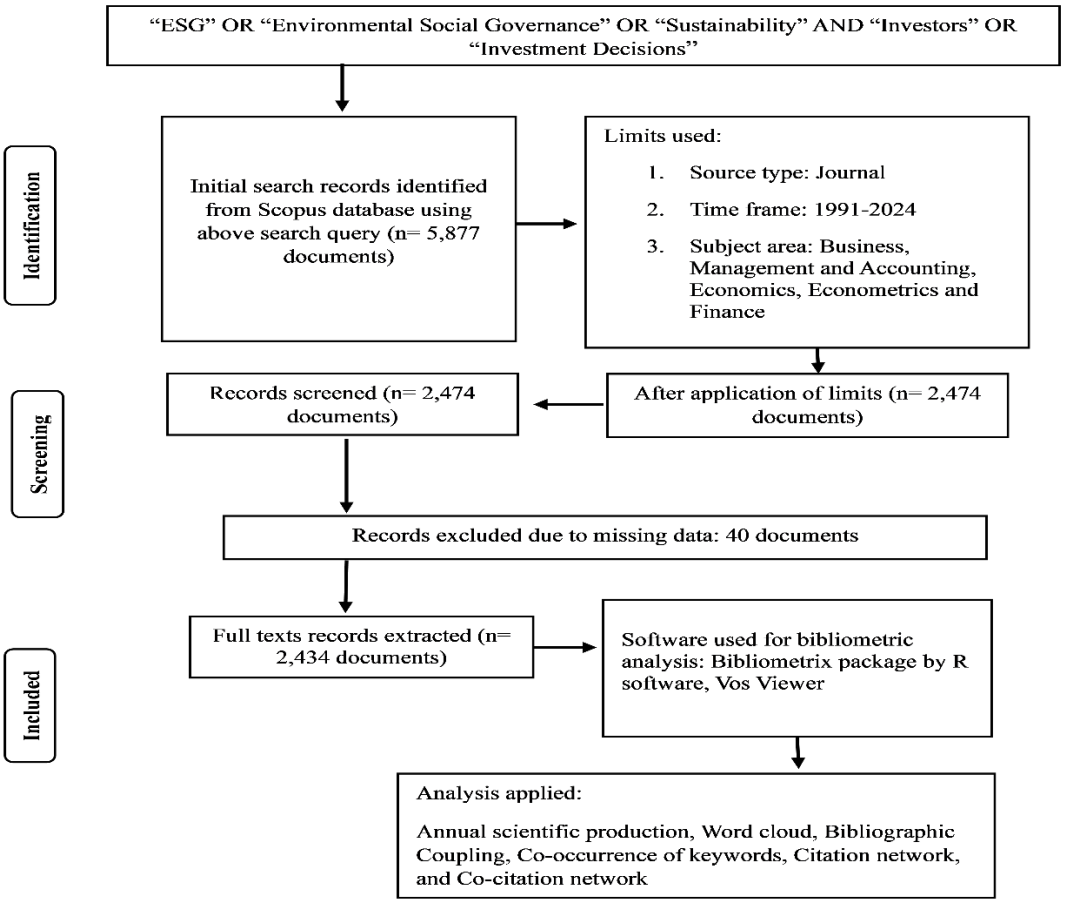

Fig. 1 PRISMA Framework
Source: Author's Creation

6. RESULTS AND FINDINGS OF THE STUDY

6.1. CATEGORIZATION BASED ON YEAR OF PUBLICATION:

The quantity of scientific material generated by a group of researchers, an organization, or a country in a given year is the annual scientific production (Antunes, 2015). Fig. 2 depicts the scientific annual output regarding the total number of papers produced yearly from 1991 to 2024. The data reveals a general upward trend over the observed period. From 1991 to around 2008, the production of scientific articles remained relatively low and stable. However, beginning around 2008, there is a noticeable gradual increase in articles published each year, indicating growing interest and advancements in scientific research and publications. A significant rise in the annual publication of articles became apparent around 2015, with the growth rate accelerating significantly from this point onward. A sharp peak is observed in 2021, and this spike can be attributed to a specific event or surge in research activity, possibly related to the global COVID-19 pandemic. Following the highest peak in 2023, there is a modest decrease in the quantity of articles produced in 2024, as the data for bibliometric analysis is taken up to July 2024. Despite this decline, the number of articles published during these years remains significantly higher than in the years preceding 2020. Fig. 2 show a stable early period from 1991 to around 2008, followed by a gradual increase starting around 2008 and leading to a more accelerated growth phase beginning around 2015. The sharp peak in 2021 suggests a correlation with the COVID-19 pandemic, during which much research was conducted and published. This result suggests that the scientific community has experienced exponential growth in research output, particularly over the last decade, with a notable peak in 2021. Despite the recent slight decline, the level of scientific activity remains higher compared to earlier decades.

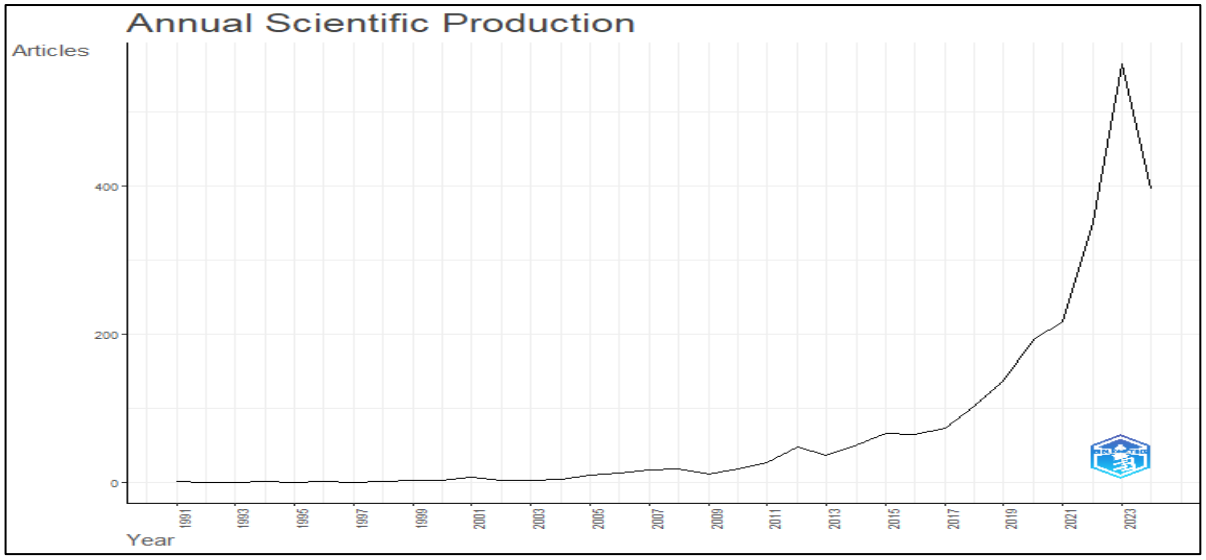

Fig. 2 Annual Scientific Production

6.2 ANALYSIS USING WORD CLOUD:

A word cloud is produced by a word frequency analysis to discover commonly used words and phrases. It is a beneficial final product and an invaluable instrument for analyzing the provided facts (Donthu et al., 2021). Fig. 3 presents a word cloud highlighting the most prominent terms related to sustainable development, investments, and associated topics. The analysis reveals several key insights. The dominant terms in the word cloud are "Sustainable Development," "Investments," and "Sustainability." "Sustainable Development" is the most prominent term, indicating its central importance in the discussion. "Investments" is also highly notable, suggesting a strong focus on the financial aspects related to sustainability. "Sustainability" emphasizes the importance of maintaining ecological and social balance. Other significant terms include "Investment," the singular form of "Investments," which frequently appears, highlighting its significance.

"Decision Making" reflects the importance of strategic choices in investments and sustainability initiatives. "Commerce" indicates the commercial and economic dimensions of sustainable development. "Climate Change" represents the environmental challenges addressed within sustainable development discussions. "Environmental Economics" points to the financial analysis of environmental policies and impacts. An additional notable term is "Corporate Social Responsibility (CSR)," which highlights the role of businesses in contributing to sustainable development. "Governance" underscores the importance of regulatory and policy frameworks in sustainability. "Financial Markets" suggests the connection between sustainability and financial market activities. "China" and "United States" indicate significant geographic focus or contributions from these regions. "Stakeholder" emphasizes the involvement of various parties in sustainable development. "Covid-19" suggests recent impacts or considerations related to the pandemic. The dominant terms reveal a strong emphasis on sustainable development and investments, with related aspects such as decision-making, commerce, and climate change also being significant. The presence of terms like "Financial Markets," "Environmental Economics," and "Commerce" indicates a substantial connection between economic activities and sustainable development. Geographical and policy aspects are also highlighted by terms like "China," "United States," "Governance," and "Corporate Social Responsibility," pointing to the roles of different regions and policy frameworks.

Additionally, "COVID-19" shows that recent global events are considered in the context of sustainable development. Some words like investment decisions, risk perception, COVID-19, and profitability appear small in the word cloud, indicating they are less cited. Overall, Fig. 3 effectively visualizes the interconnected themes and focus areas within the broader topic of sustainable development and investments, underscoring the multifaceted nature of this field.

Fig. 3 Word Cloud

6.3 SCIENCE MAPPING:

Science mapping analyzes the interconnections among disciplines, fields, specialties, and individual publications or authors (Cobo et al., 2011). The approaches for science mapping include co-word analysis, bibliographic coupling, citation analysis, co-citation analysis, and co-authorship analysis (Donthu et al., 2021).

The provided visualization in Fig. 4 is a bibliometric network illustrating the co-occurrence of keywords in sustainability research. This network comprises nodes that signify terms and edges that indicate their co-occurrence in scholarly literature, with the dimensions of the nodes and the width of the edges expressing the frequency of these occurrences (Van Eck & Waltman, 2010). The network displays multiple unique clusters, each signifying a particular theme domain within sustainability study. The red cluster focuses on terms like “esg,” “sustainability reporting,” “csr,” and “financial performance,” indicating a significant body of work examining the intersection of sustainability practices and financial outcomes. In contrast, the green cluster centers around “sustainability,” “socially responsible investment,” and “sustainable investing,” reflecting research on sustainable investment and corporate social performance. Another prominent area, represented by the blue cluster, includes keywords such as “decision making,” “economic and social effects,” “environmental impact,” and “planning.” This cluster highlights studies concentrating on sustainability’s economic and social dimensions, the decision-making processes, and the environmental impacts. Meanwhile, the yellow cluster encompasses terms like “costs,” “alternative energy,” and “biofuels,” pointing to research focused on the economic aspects of renewable and alternative energy sources. The purple cluster, featuring keywords such as “environmental policy,” “stock market,” and “climate policy uncertainty,” covers the interplay between environmental policies and their effects on financial markets and investment strategies.

At the center of this network, “sustainability” is the most prominent node, underscoring its pivotal role in this field of research. Other significant terms, such as “ESG” and “investment,” are closely linked to sustainability, highlighting their importance. The presence of terms like “decision-making” emphasizes the crucial role of decision-making processes in sustainability and ESG contexts. Additionally, the network’s dense interconnections and diverse clusters illustrate the interdisciplinary nature of sustainability research, which spans economics, finance, environmental science, and policy-making. Notably, emerging themes are also evident, with keywords like “COVID-19 pandemic,” “investment horizon,” and “climate policy uncertainty,” indicating new areas of interest and their relevance to sustainability and ESG. Overall, this visualization offers a thorough summary of the present state of sustainability research, emphasizing key focus areas and their interrelationships, demonstrating the complexity and multidisciplinary approach required in this field.

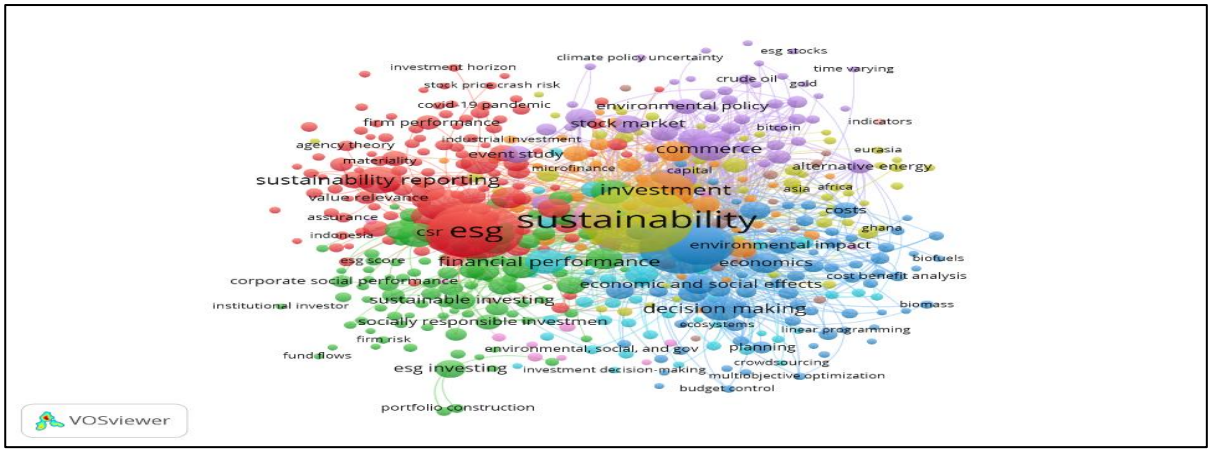

Fig. 4 Co-occurrence of Keywords

Bibliographic coupling is a science mapping technique built on the assumption that two publications with shared references demonstrate content similarities (Donthu et al., 2021). Fig 5 illustrates the graphical representation of bibliographic coupling where the published documents are used as a unit of analysis. The network consists of seven clusters of different colors, each representing the areas where research has been done. This network consists of various nodes representing the documents sharing standard references and similar content. It reveals the extensive range of themes and the most recent advancements in the area. The yellow cluster highlights the documents of authors' namely, "friede g.; busch t.; bassen a." meaning these documents have similar references and are identical in nature. In their respective document, they highlighted the importance of integrating the ESG criteria into investment decisions to fully use the value-enhancing aspects of ESG considerations and focused on long-term paradigms for sustainable investment. The sky-blue coloured cluster is separate from all other clusters indicating that the papers of authors "pedersen I.h.; fitzgibbons," "arfaoui n.; naeem m.a.; boubak" and "m.h. (2021)" are not related to the contents of other clusters and also have a different reference list, though, within the cluster, they have similar content and are associated with a familiar area. In their paper "pedersen I.h.; fitzgibbons" presents a theory wherein given stock's environmental, social, and governance (ESG) score serves dual functions: providing insights into business fundamentals and shaping investor preferences. The theory's predictions were assessed using proxies for E (carbon emissions), S, G, and overall ESG.

Similarly, "arfaoui n.; naeem m.a.; boubak" also looks into the clean energy and green market. In their research, they utilize a network methodology to analyze the interrelation of renewable energy, green markets, and cryptocurrencies. The papers of authors "newell g.; nanda a.; moss a." focusing on ESG in real estate investment by analyzing the strategic challenges associated with benchmarking ESG in real estate investment, particularly focusing on opportunities for future enhancement of ESG benchmarks, "li x.; xu f.; jing k. (2022)" assessing the uncertainty associated with ESG data and presenting a comprehensive enhanced indexation model incorporating real-world restrictions by using ESG ratings of three mainstream raters of China and "bremser w.g.; jermakowicz e.k." presenting a case report on sustainability reporting initiatives taken by the Ford motor company, do not have standard references with other publications; hence it has no network. In the red cluster, it can be observed that the documents of "venter e.r.; van eck l. (2021)" have similar content but deviate from the center, from which It can be deduced that it pertains to the concept of sustainability but is different from the idea present in all other papers of that respective cluster. In their paper "venter e.r.; van eck l. (2021)" enhance the current discourse on Extended External Report (EER) assurance by providing a thorough overview of academic literature to inform the standard-setting initiatives of the International Auditing and Assurance Standards Board (IAASB) and the practice of EER assurance.

International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 10 No. 4, 2024
https://www.theaspd.com/ijes.php
.

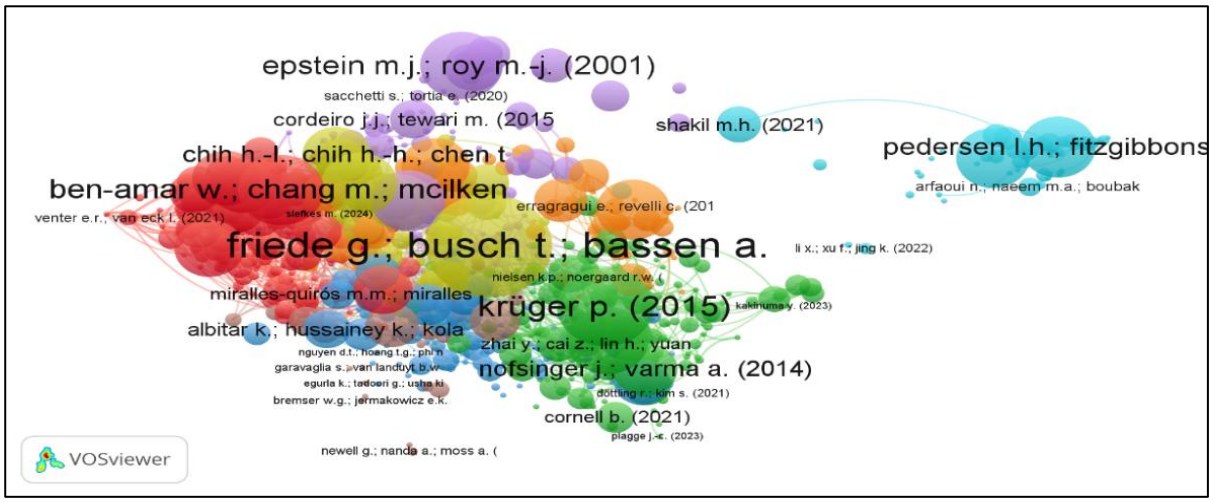

Fig. 5 Bibliographic coupling of documents

Citation analysis is a fundamental method for scientific mapping, predicated on the notion that citations denote intellectual connections between publications, established when one publication references another (Donthu et al., 2021). Fig 6 depicts the bibliometric visualization of the citation network of the documents published from 1991 to 2024. The paper of "ghisellini p.; cialani c., ulg" is the most cited document made by other publications, which talks about the implementation of circular economy, and it involves the implementation of more environmentally friendly manufacturing methods at the organizational level, the utilization of renewable technology and resources, together with the adoption of appropriate, transparent, and stable regulations and instruments. This paper was then followed by "kruger p. (2015)" wherein the author examined the stock market's response to both good and bad events related to a firm's corporate social responsibility, whereas the paper of "epstein m.j.; roy m.-j. (2001)," discusses about a model that identifies the causes of corporate social performance, the strategies that managers can employ to affect that performance, and the consequences of those strategies on both corporate social and financial results. On the other hand, the paper of "ben-amar w.; chang m.; mcilken" examines the impact of female participation on corporate boards regarding the reaction to stakeholders' demands for enhanced public reporting on climate change-related risks and the findings strengthen global programs aimed at improving gender diversity in corporate governance and illustrate board efficacy in stakeholder management. The publication of "drempetic s.; klein c.; zwerge" emphasizes on the believes of SR investor's code of ethics. The results of the study prompt inquiry into whether the approach of the ESG score in assessing corporate sustainability favors larger organizations with greater resources while failing to furnish socially responsible investors with the requisite knowledge to make decisions aligned with their values and, therefore, results in an opening discussion about what sustainability rating agencies assess with ESG ratings, the specific metrics that require evaluation, and if the sustainable finance sector can achieve its self-imposed goals through this measurement. Among the most cited network of documents, the paper by "tang d.y zhang y. (2020)" discusses green bonds and finds out that the issuance of green bonds is beneficial for the firm's existing shareholders. The paper of "antoncic m. (2019)" is in the center, as seen in the figure below, indicating other authors have referred to the article but have not cited it. In his paper, the author addresses the evolution of risk management to encompass sustainability concerns, which has led to the development of several approaches for assessing and managing nonfinancial risks and analyzes the growing interest of shareholders in ESG risks, opportunities, and associated data, which aids in evaluating corporate performance and optimizing the allocation of economic capital to its most efficient utilizers.

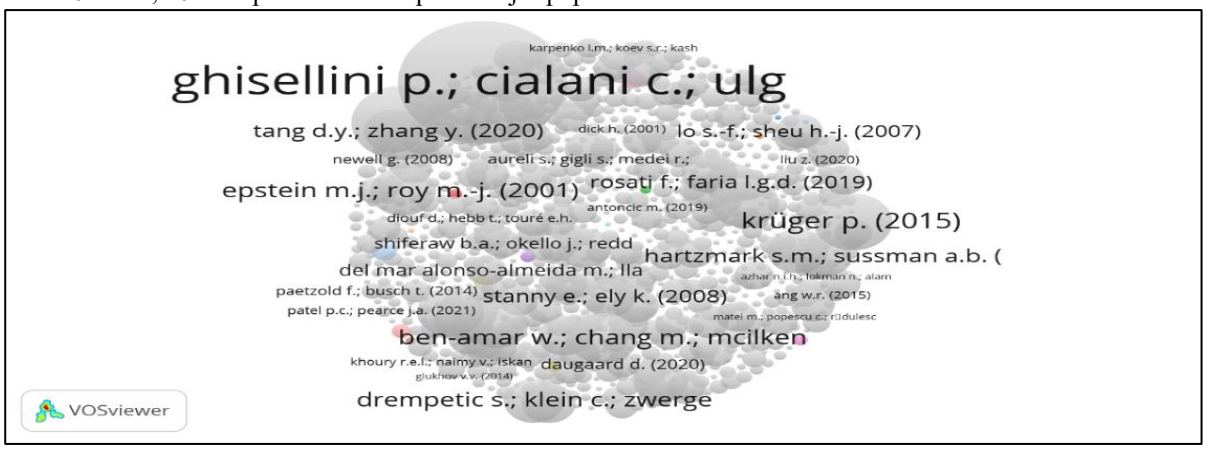

Fig. 6 Citation network of documents

Co-citation analysis is a science mapping tool that claims that articles cited together often exhibit theme connections and here two publications are interconnected when they are cited jointly in the reference list of a third publication (Donthu et al., 2021). In Fig. 7, there are four different clusters of red, yellow, blue, and green color. The papers of authors "benabou r., tirole j., individ" collectively have the highest citation given by the authors of papers in red, blue, and green clusters. The publications of "Freeman r.e., strategic manage" have the highest citations among all the publications. They highlighted the role of stakeholders in sustainability reporting. In the red cluster, the publications of "cheng b., ioannou i., serafeim" have the most citations from other publications. The papers of authors "Pedersen I.h., Fitzgibbons s." are separate from the network from which it can be concluded that it has not co-occurred in the reference list of any publication. In their paper, they presented a theory for each stock's environmental, social and governance scores, which influenced investor preferences.

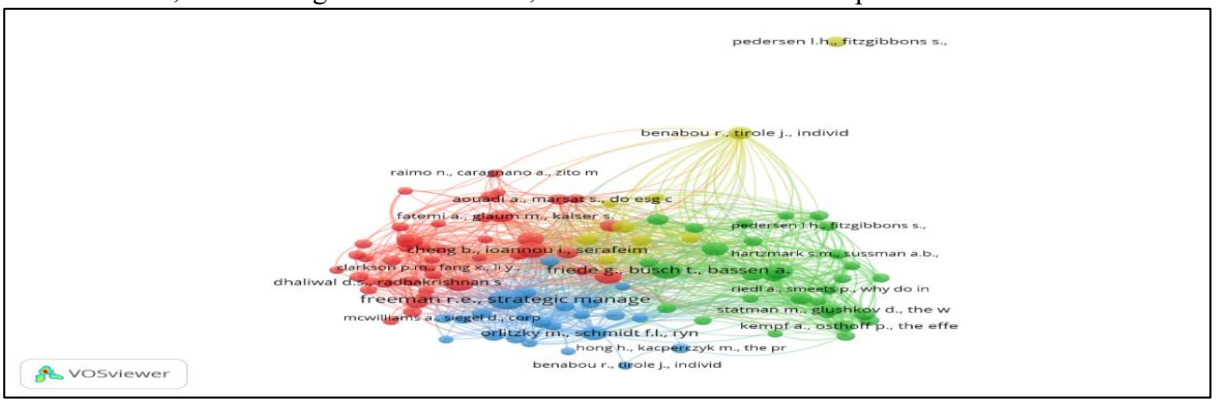

Fig. 7 Co-citation network (cited references)

Co-authorship analysis discusses the authors' intellectual collaboration (Ponomariov & Boardman, 2016). Fig. 8 depicts the bibliometric visualization of the co-authorship analysis, highlighting three different clusters of red, green, and blue colour. Among all the clusters, "Serafeim g." is the author with the highest collaboration with other authors, and it is in the green cluster itself. He concludes his paper by saying that public sentiment affects investor perceptions of the importance of sustainability initiatives and that extensive ESG data can aid in pinpointing "value" ESG equities. In the red cluster, it can be observed that "freeman r.e."; "Garcia-sanchez i.m."; "tsang a." are the few authors having the most collaborations. "tsang a." in their paper investigates the relationship between local companies' corporate social responsibility (CSR) involvement and household participation in the stock market of US. The results indicated that households are more likely to participate in the stock market and invest a larger portion of their portfolios in equities when the average CSR performance of local companies is high. This suggests that the CSR performance of local firms substantially boosts investors' confidence in the firms' ethical practices and financial returns from equity investments, thereby influencing their propensity to engage in the stock market. The authors having the highest collaboration in the blue cluster are "li y.; wang y. and naeem m.a.". The impact of M&A activity in the energy sector on corporate

environmental protection investment (EPI) and the factors leading to this effect were explored by "li y." in their paper.

In contrast, the paper of "wang y." seeks to present the Index of Cryptocurrency Environmental Attention (ICEA), designed to quantify the relative volume of media discourse regarding the environmental implications of cryptocurrencies. On the other hand, the study by author "wang x." examines the impact of ESG performance on corporate sustainability and finds factors influencing this relationship from the perspective of external governance frameworks. The findings suggest that corporate ESG performance can promote sustainable growth. The caliber of external audits, the percentage of institutional investors' holdings, and the emphasis of analysts favorably influence ESG performance, hence fostering sustainable development. All three authors who collaborated the most in this cluster focused more on the environmental aspect of ESG. Authors like "nakai m.; ullah s." have no collaboration with other authors. "Nakai m." examined how investors assess membership in a sustainability index by determining the influence of inclusion in and exclusion from the index on the stock price. The results indicate that participation in the index was assessed positively. In contrast, departure from the index did not result in a significant decline in share prices, whereas "Ullah s." in their paper examined the correlation between academic directors and business eco-innovation in Chinese A-listed companies under the increasing urgency of climate change, the findings indicate that academic directors exert a favorable and substantial influence on company eco-innovation.

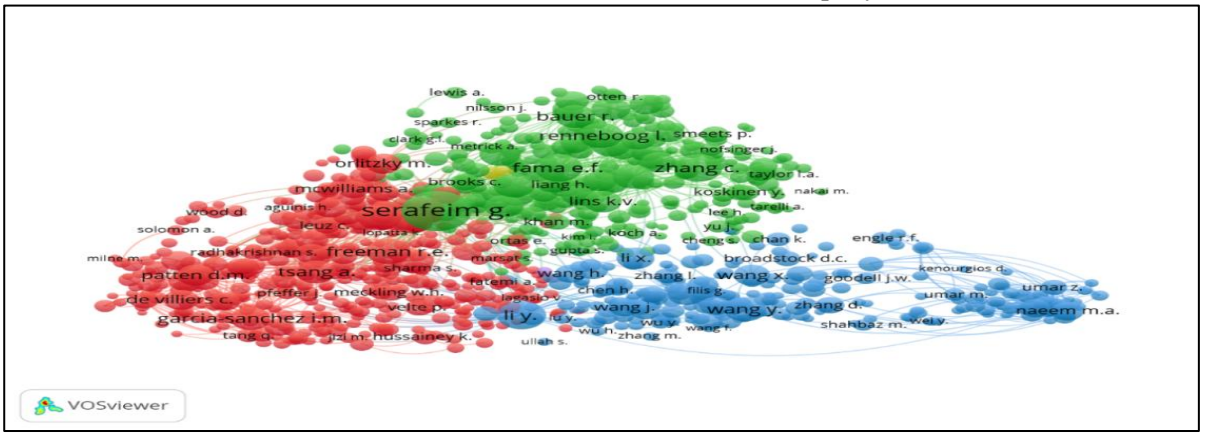

Fig. 8 Co-authorship analysis

7. CONCLUSION & LIMITATION

Using the bibliometric tools, a significant amount of data acquired from Scopus was analyzed for this study. The findings from the analysis disclosed important information regarding the most often occurring keywords; most cited publications, bibliographic coupling of the documents, most frequently cited articles, and author collaboration. The word cloud, which shows word frequency and the yearly production of scientific publications, was also highlighted in the paper.

The annual scientific production revealed that even though starting slowly, there was exponential growth in the publication of the papers. The co-occurrence of keywords identified specific keywords like "sustainability" and "ESG" that are most frequently used, as well as words like "investment decisions" and "ESG stocks" are the least frequently used words. "Serafeim g." is the author with the highest collaboration, and in his paper, he talks about how public sentiments affect investor perception. The citation analysis revealed that the "ghisellini p.; cialani c., ulg" document is the most cited paper among other publications that emphasized on the implementation of cleaner production at the organizational level.

As this research is limited to a single database, future research may draw samples from other databases, like the Web of Science, JASTOR, Google Scholar to further support the conclusions of the present study. Furthermore, one may modify the limitations and incorporate additional terms into the search string to obtain an additional data set for the bibliometric analysis. Doing so will broaden the research's scope beyond the specified keywords and provide a more thorough perspective.

8. FUTURE RESEARCH DIRECTIONS

In addition to these limitations, the future research areas that may help the researchers are as follows:

1. Exploring the ESG aspects influencing the investment behavior - With the increasing awareness and government initiatives about climate change, corporate accountability and ethical practices, investors are now gradually becoming more aware about the environmental, social and governance (ESG) aspects incorporation into their investment portfolios. However, how these different pillars of ESG (environmental sustainability, social responsibility and governance standards) collectively influences the investor preferences remains an underexplored concept. Future research could delve deeper into understanding how the ESG factors form the investment behavior of individual as well as institutional investors. The researchers could also study how demographic, cultural changes and psychological factors affect ESG sensitivity, therefore providing an advanced understanding of investor motives within the realm of sustainable investment.
2. Comparative analysis of returns from traditional investing and ESG investing – Another important area for future research may focus on comparing the returns from traditional investment strategies and returns from ESG investing. ESG investments are often considered to offer long-term value and low risk, therefore the researchers can do a comparison and see the returns provided by traditional stocks and ESG stocks and provide investors valuable information about the risk and profitability. The researchers could also explore the risk-adjusted performance, volatility of ESG investments during the COVID-19 pandemic.
3. Role of behavioral biases on sustainable investment decisions- Behavioral biases describes the irrational behavior and psychological influences that affect the financial decision making of the individuals, therefore these biases can help in proper understanding of the deviations made from traditional investment decisions leading to the intersection of sustainable investments, which provides a ground for further exploration. The cognitive and emotional biases can significantly influence the investors perception and engagement with sustainable investment opportunities. The researchers could model these behavioral biases quantitatively or qualitatively in order to understand how investors reinforce or undermines ESG oriented investment behavior.

9. REFERENCES

1. Ahmad, H., Yaqub, M., & Lee, S. H. (2023). Environmental-, social-, and governance-related factors for business investment and sustainability: A scientometric review of global trends. *Environment, Development and Sustainability*, *26*(2), 2965–2987. https://doi.org/10.1007/s10668-023-02921-x
2. Al-Hiyari, A., & Kolsi, M. C. (2021). How do stock market participants value esg performance? Evidence from middle eastern and north african countries. *Global Business Review*, 097215092110015. https://doi.org/10.1177/09721509211001511
3. Antunes, A. A. (2015). How to evaluate scientific production. *Revista Do Colégio Brasileiro de Cirurgiões*, *42*(suppl 1), 17–19. https://doi.org/10.1590/0100-69912015S01006
4. Bae, K.-H., & Goyal, V. K. (2010). Equity market liberalization and corporate governance. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1670397
5. Barbier, E. B. (1987). The concept of sustainable economic development. *Environmental Conservation*, *14*(2), 101–110. https://doi.org/10.1017/S0376892900011449
6. Barouki, R., Kogevinas, M., Audouze, K., Belesova, K., Bergman, A., Birnbaum, L., Boekhold, S., Denys, S., Desseille, C., Drakvik, E., Frumkin, H., Garric, J., Destoumieux-Garzon, D., Haines, A., Huss, A., Jensen, G., Karakitsios, S., Klanova, J., Koskela, I.-M., … Vineis, P. (2021). The COVID-19 pandemic and global environmental change: Emerging research needs. *Environment International*, *146*, 106272. https://doi.org/10.1016/j.envint.2020.106272
7. Becchetti, L., Bobbio, E., Prizia, F., & Semplici, L. (2022). Going deeper into the s of esg: A relational approach to the definition of social responsibility. *Sustainability*, *14*(15), 9668. https://doi.org/10.3390/su14159668
8. Bruntland, G. H., World Commission on Environment and Development., & Australia. (1990). *Our common future*. Oxford University Press.
9. Buchanan, J. M., & Stubblebine, Wm. C. (1962). Externality. *Economica*, *29*(116), 371. https://doi.org/10.2307/2551386
10. Carlsson, H., Larsson, S., Svensson, L., & Åström, F. (2017). Consumer credit behavior in the digital context: A bibliometric analysis and literature review. *Journal of Financial Counseling and Planning*, *28*(1), 76–94. https://doi.org/10.1891/1052- 3073.28.1.76
11. Chatzitheodorou, K., Skouloudis, A., Evangelinos, K., & Nikolaou, I. (2019). Exploring socially responsible investment perspectives: A literature mapping and an investor classification. *Sustainable Production and Consumption*, *19*, 117–129. https://doi.org/10.1016/j.spc.2019.03.006
12. Chiromba, C. (2020). Responsible investment and its impact on investment decisions: *Zimbabwe scenario*. *The Journal of Investing*, *29*(2), 98–109. https://doi.org/10.3905/joi.2019.1.105

13. Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the American Society for Information Science and Technology*, *62*(7), 1382– 1402. https://doi.org/10.1002/asi.21525
14. Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*, 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070
15. Dragomir, V. D. (2020). Theoretical aspects of environmental strategy. In V. D. Dragomir (Ed.), *Corporate Environmental Strategy: Theoretical, Practical, and Ethical Aspects* (pp. 1–31). Springer International Publishing. https://doi.org/10.1007/978- 3-030-29548-6_1
16. Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, *5*(4), 210–233. https://doi.org/10.1080/20430795.2015.1118917
17. Gibson, R., & Krueger, P. (2017). The sustainability footprint of institutional investors. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2918926
18. Harris, J. M. (2003). Sustainability and sustainable development. *International Society for Ecological Economics*, *1*(1), 1-12.
19. Jain, K., & Tripathi, P. S. (2023). Mapping the environmental, social and governance literature: A bibliometric and content analysis. *Journal of Strategy and Management*, *16*(3), 397–428. https://doi.org/10.1108/JSMA-05-2022-0092
20. Jasch C. (2006). How to perform an environmental management cost assessment in one day. *Journal of Cleaner Production*, *14*(14), 1194–1213. https://doi.org/10.1016/j.jclepro.2005.08.005
21. Jianping, L., Minrong, L., Jinnan, W., Jianjian, L., Hongwen, S., & Maoxing, H. (2014). Global environmental issues and human wellbeing. In L. Jianping, L. Minrong, W. Jinnan, L. Jianjian, S. Hongwen, & H. Maoxing (Eds.), *Report on Global Environmental Competitiveness (2013)* (pp. 3–21). Springer. https://doi.org/10.1007/978-3-642-54678-5_1
22. Johnston, A. (2007). Higher education for sustainable development: final report of international action research project. In *Forum for the Future Action for a Sustainable World*.
23. Jonwall, R., Gupta, S., & Pahuja, S. (2023). A comparison of investment behavior, attitudes, and demographics of socially responsible and conventional investors in India. *Social Responsibility Journal*, *19*(6), 1123–1141. https://doi.org/10.1108/SRJ- 08-2021-0358
24. Khan, M., Serafeim, G., & Yoon, A. (2015). Corporate sustainability: First evidence on materiality. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2575912
25. Martínez-López, F. J., Merigó, J. M., Valenzuela-Fernández, L., & Nicolás, C. (2018). Fifty years of the *European Journal of Marketing*: A bibliometric analysis. *European Journal of Marketing*, *52*(1/2), 439–468. https://doi.org/10.1108/EJM-11-2017- 0853
26. Mishra, A. K., Bansal, R., & Maurya, P. K. (2023). Investing for a better tomorrow: Values-driven antecedents of investment in socially responsible equity funds by Indian retail investors. *Journal of Cleaner Production*, *420*, 138441. https://doi.org/10.1016/j.jclepro.2023.138441
27. Parikh, A., Kumari, D., Johann, M., & Mladenović, D. (2023). The impact of environmental, social and governance score on shareholder wealth: A new dimension in investment philosophy. *Cleaner and Responsible Consumption*, *8*, 100101. https://doi.org/10.1016/j.clrc.2023.100101
28. Park, S. R., & Jang, J. Y. (2021). The impact of esg management on investment decision: Institutional investors' perceptions of country-specific esg criteria. *International Journal of Financial Studies*, *9*(3), 48. https://doi.org/10.3390/ijfs9030048
29. Ponomariov, B., & Boardman, C. (2016). What is co-authorship? *Scientometrics*, *109*(3), 1939–1963. https://doi.org/10.1007/s11192-016-2127-7
30. Rooh, S., El-Gohary, H., Khan, I., Alam, S., & Shah, S. M. A. (2023). An attempt to understand stock market investors' behaviour: The case of environmental, social, and governance (Esg) forces in the pakistani stock market. *Journal of Risk and Financial Management*, *16*(12), 500. https://doi.org/10.3390/jrfm16120500
31. Senadheera, S. S., Withana, P. A., Dissanayake, P. D., Sarkar, B., Chopra, S. S., Rhee, J. H., & Ok, Y. S. (2021). Scoring environment pillar in environmental, social, and governance (Esg) assessment. *Sustainable Environment*, *7*(1), 1960097. https://doi.org/10.1080/27658511.2021.1960097
32. Sood, K., Pathak, P., Jain, J., & Gupta, S. (2023). How does an investor prioritize ESG factors in India? An assessment based on fuzzy AHP. *Managerial Finance*, *49*(1), 66–87. https://doi.org/10.1108/MF-04-2022-0162
33. Sullivan, R., & Mackenzie, C. (Eds.). (2017). *Responsible investment* (1st ed.). Routledge. https://doi.org/10.4324/9781351283441
34. Sultana, S., Zulkifli, N., & Zainal, D. (2018). Environmental, social and governance (Esg) and investment decision in bangladesh. *Sustainability*, *10*(6), 1831. https://doi.org/10.3390/su10061831
35. Trahan, R. T., & Jantz, B. (2023). What is esg? Rethinking the "e" pillar. *Business Strategy and the Environment*, *32*(7), 4382– 4391. https://doi.org/10.1002/bse.3371
36. United Nations Development Programme. (2018). *Human development indices and indicators 2018: Statistical update*. United Nations.
37. Van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3
38. Ziolo, M., Fidanoski, F., Simeonovski, K., Filipovski, V., & Jovanovska, K. (2017). Sustainable finance's role in creating conditions for sustainable economic growth and development. In W. Leal Filho, D.-M. Pociovalisteanu, & A. Q. Al-Amin (Eds.), *Sustainable Economic Development: Green Economy and Green Growth* (pp. 187–211). Springer International Publishing. https://doi.org/10.1007/978-3-319-45081-0_11