

# Sustainable Investment Practices: Bibliometric Analysis on Ten Years of Observations in ESG Agencies

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**Abstracts:** Objective: To analyze sustainable investments by means of a bibliometric study using the SLR technique applied to scientific research records on ESG agencies, and the indices used, over a ten-year period from 2013 to 2023. Methodology: It is a qualitative and documentary research that relies on hermeneutics for the interpretation of written texts. In addition, a bibliometric analysis was made by means of a systematic and structured review of the literature following the SLR method, applied to the scientific records of the Scopus database. Results: This study found that companies' intangible assets should be represented by stock market indices that show a responsible commitment to the environment. Therefore, governance plans should address more convincingly the priorities of socially responsible investment. Conclusions: A standardization of institutional ESG indicators is required to make the results of the measurements made on companies worldwide to demonstrate corporate sustainability more understandable and transparent and disclosed to the public. Originality: This research provides current knowledge on the factors used by ESG agencies to measure the sustainability of companies worldwide. The business world needs to be informed of these research advances, because there is a great diversity of aspects that must be considered for companies to achieve the sustainability they deserve, and a standard that facilitates a better measurement of sustainable investment indexes has not yet been established.

**Keywords:** ESG Agencies, Intangible Assets, Social Responsibility, Social Responsibility, Sustainability, Sustainable Investment.

## 1. INTRODUCTION

Sustainable investment practices have become a significant value for companies that wish to position themselves in the market with greater strength, credibility and leadership. For this reason, it is important to know how the topic of sustainable investment has evolved in organizational practices over the last ten years and to be able to distinguish what companies are doing to qualify as sustainable companies worldwide. When it comes to the systematic review of written documents, some techniques such as the Structured Literature Review (SLR) can be taken into consideration. This SLR refers to an instrument that allows for the analysis of multiple meanings of a detailed exploration [1] [2] [3] [4].

Literature consultations through systematized reviews, such as bibliometric analysis, correspond to articles selected for their quality, which show the rigorousness that scientific models must comply with in research that is publicly disclosed [5] [6]. In consideration of the above, this study aims to analyze sustainable investments through the bibliometric study with the SLR technique applied to the records of scientific research on Environmental, Social and Governance (ESG) agencies and the indexes used, over a period of ten years from 2013 to 2023. The SLR technique helps to explore academic literature to broaden the understanding of concepts and to be able to discern about the thematic studied.

The 21st century marked a boom in scientific production, extending knowledge through the dissemination of research advances worldwide. Much of the research contributions have followed the development of literature reviews through different methodologies that help this process [7]. A key aspect for the good performance of a

systematic literature review is the use of software for data management that must be relevant to the selected topic. This exhaustive management of multiple data helps to elaborate the adequate synthesis of the literature registered in the databases, such as the Scopus database. In this sense, advanced search engines should be used in order to reach the largest number of reviews and be able to achieve a quality study [8].

From the point of view of Massaro [3], Structured Literature Review (SLR) should follow a systematic plan with subsections: 1) writing the document review protocol, 2) developing the questions of the document review, 3) defining the type of study with its scope based on the exhaustive literature review, 4) being clear about the impact of the article, 5) clarifying the analytical framework, 6) guaranteeing the reliability of the literature review, 7) validating the study, 8) managing data coding, 9) encouraging critical development, 10) generating new knowledge as a result of the study. In this regard, the following questions stand out for this research: a) How is scientific research developing in relation to sustainable investment indexes, b) What is the future of research that is oriented to the registration of ESG with sustainable investment indexes, c) What is the future of research that is oriented to the registration of ESG with sustainable investment indexes?

The effect of climate change and environmental pollution has motivated the interest in the financial returns of sustainable investment indexes, which in turn has led to the participation of government entities and countries seeking solutions committed to the environment. It can be noted that responsible and sustainable companies have increased in the world, because the interest to qualify in the global market determines the competitive positioning of each company. In addition, the tactics for Sustainable and Responsible Investment (SRI) have shown significant growth due to the measures that have been taken against the criteria for environmental, social and governance (ESG) investment. [9].

In the global society, interest in the defense of the natural environment continues to grow. Therefore, researchers are joining worldwide joint actions to review the causes and consequences of climate change, with the aim of disseminating the problem. In this way, the reality is being recognized and awareness of the issue is being raised. However, it is pertinent to study to what extent the observations of business practices have been advanced and to verify which are the strengths, as well as to know which weaknesses remain in force, which indicators contribute to the continuous improvement of organizations in order to create records of the business memory for future cases. In response to these needs, the indexes that measure sustainable development were created, which make it possible to verify the level reached by companies, through the ranking achieved, within the standards of quality in Corporate Social Responsibility (CSR). Based on the above, each company is projected with a recognition of its brand in the stock markets, which contributes to business leadership in the environment of competitive economic, social and environmental markets. All this leads to make companies more competitive with a value for investors of this type. [10].

The ESG concept is used to create value through the intangible assets of companies. These intangible assets should be represented by stock market indices that show companies that are truly environmentally responsible. These considerations help investors to make decisions and contribute to making portfolios sustainable and attractive to investors [10] [11] [12] [13] [14]. The responsibility and sustainability of the country is relevant to all its inhabitants and governments should encourage social responsibility in a more convincing way. Government plans should address the priorities of socially responsible investment. Since the publication of the Brundtland Report in 1987, efforts have been made to address this need to ensure a better environment for future generations, and to promote sustainable investments in public goods. This includes corporate responsibility and financial benefit to stakeholders. [15].

The European Commission establishes that sustainable finance should be oriented to specific investment provisions. This intention seeks the consideration of environmental and social factors, which are crucial to achieve sustainable objectives and activities to minimize climate change, pollution and natural disaster hazards. This model emphasizes the importance of ESG factors in obtaining economic resources through investments. Investment in assets based on ESG criteria has increased by twelve trillion dollars in the United States and eleven trillion euros in

Europe since 2018. This circumstance demonstrates a very significant figure for investors interested in socially responsible investment and contributes to creating a more attractive market for investors [16].

Sustainable investment is vital in the global economy and the Sustainable Investment Index has had a positive impact on the world, because it revalues companies that are developing investment funds in accordance with SRI standards. In addition, the economy encompasses a wide range of activities, as economic growth must be combined with sustainability. These selected papers from the databases represent a wealth of literature that has endorsed relevant scientific information on the challenges countries face in ensuring that government regulations are complied with and that appropriate controls are implemented through adequate audits. Standardization of institutional ESG indicators could be a possible way forward [17].

## 2. METHODOLOGY

The research is qualitative and documentary, which is based on the Structured Literature Review (SLR) technique [3] [4]. The systematic process has ten steps described above, which are shown through the development of the results. First, the search equations were prepared and entered into the Scopus indexer. This first part of the study is shown in Table 1.

**Table 1. Process with search equations**

Search equation in Scopus	Subject áreas	# documents
sustainable AND investment AND indexes AND Sustainability (AND pubyear > 2013 AND pubyear < 2023)	environmental science - social sciences - business, management and accounting	817
sustainable AND investment AND indexes AND Sustainability (AND pubyear > 2013 AND pubyear < 2023)	social sciences - business, management and accounting	711
sustainable AND investment AND indexes AND Sustainability (AND pubyear > 2013 AND pubyear < 2023)	business, management and accounting	164

Source: Compiled by authors based on Scopus

## 3. RESULTS AND DISCUSSION

According to the postulates of Massaro et al. [3] [4], with the Structured Literature Review (SLR) technique, we proceed to the methodical application that supports the development of this research.

1) Writing the document review protocol: in this step, the main scientific articles related to sustainable investment indexes used by ESG agencies worldwide and found in the Scopus database were selected, and this result is presented in Table 2.

**Table 2. Principal documents by recent date**

Year	Title	Findings
2023 Autor	The role of socially responsible investors in environmental performance. An analysis of proactive and reactive practices.	The value and stability of SRI is related to the improvement of proactive environmental practices for companies. In addition, SRI volatility is linked to more reactive environmental practices.
2022	Quantile time–frequency price connectedness between green bond, green equity, sustainable investments and clean energy markets.	The S&P Green Bond Index and S&P Global Clean Energy are short- and long-term receivers, while MSCI Global Environment and Dow Jones Sustainability Index World are short- and long-term transmitters.
2021	Investor reactions to sustainability index reconstitutions: Analysis in different institutional contexts.	Investors understand CSR as a means of protecting the company's market value and are focused on risk reduction rather than value creation.
2020	Sustainable investments in the Norwegian stock market.	La sensibilidad del mercado, el estilo de inversión y el sesgo de la industria no representan diferencias significativas entre los portafolios ESG construidos con el enfoque alto-bajo. No se encontró evidencia que vincule los criterios ESG con la rentabilidad de las acciones en el mercado bursátil de Noruega.
2019	Testing the Shared Value Business Model as	Banks remain highly skeptical. There is no sign of a long-term

	a Driver of Change in Financial Institutions: Insights from Banks Listed on the Brazilian Sustainability Index/ISE.	vision to offer customers products with CSV Shared Value Creation or to create innovative business models that incorporate concepts.
2018	Corporate sustainability and value creation: the case of the "Dow Jones Sustainability Index".	The findings showed no effect and did not support the hypothesis of higher performance, but neither did they show a decrease in financial performance associated with this fact.
2017	How can CSR identity be evaluated? A pilot study using a Fuzzy Expert System.	The output of the application was designed to measure a company's CSR identity. The ability to identify the various indicators of the final CSR index will allow managers to use this information for decision making.
2016	Do sustainable companies have a better financial performance? A study on Brazilian public companies.	Industry classification has a greater impact on a company's economic and financial performance than investments in sustainability initiatives.
2015	Sustainable investment in Korea does not catch a cold when the United States sneezes.	The findings indicate that the crisis and non-crisis periods are relatively stable. In addition, the is shown the decoupling of Korea's sustainable investment from the U.S. market.
2014	Socially responsible investments: An international empirical study of time-varying risk premiums.	The results show that corporate sustainability indices have less risk coping aids than conventional indices.
2013	Socially Responsible Investment and cleaner production in the Asia Pacific: does it pay to be good?.	The results suggest that investors can support companies that are committed to improving their environmental performance through the improvement of cleaner production processes.

Source: Compiled by authors based on Scopus

2) Questions of the documentary review: a) How is the scientific research related to sustainable investment indexes developing, b) What is the future of the research oriented to ESG registration with sustainable investment indexes?

3) Type of study and scope: documentary research of interpretative scope from the textual analysis of written documents, which were selected according to the thematic of sustainable investment indexes used by ESG agencies and using the Structured Literature Review (SLR) technique.

4) Impact of the article: this article represents a substantial value of updated knowledge on the global trends of the indexes being used by ESG to measure the sustainability of companies, based on sustainable investments. Through the documentary and systematic review with the SLR technique, a substantial interest was found in the sum of citations to all the articles up to 2022. The articles from the year 2023, due to their very recent date, do not yet reflect citations. However, the topic continues to be of great interest in the year 2023 with the study of sustainable investments, which has been left with numerous publications until the middle of this same year.

5) Analytical framework: the basis of analysis involved a review of the environmental, social and governance (ESG) criteria that address responsible corporate investment, which can be seen in the growing interest of scientific research that is adding new knowledge on this subject [18]. Reviewed articles on responsible investing demonstrate progress in research committed to financial and non-financial performance, as well as disclosure in databases offer valuable information for investors [19] [20] [21] [22] [23] [24] [25].

6) Reliability of the literature review: the process of analysis by means of the SRL technique guarantees the results in accordance with the stated objective and the answers to the research questions. In addition, the work with the Scopus database provides the guarantee of quality scientific articles. From Elsevier's statements it is known that the content registered in Scopus is reviewed in a very detailed, exhaustive and high quality way, because it is supported by scientific personnel of high trajectory and scientific experience in all disciplines and thematic areas. For this reason, the databases represent a significant value for the registration of scientific advances, in addition to letting know the researchers and trends related to research. [26] [27].

7) Validation of the study: the validity of the study is represented by the veracity of the information selected from credible and reliable data sources, such as the Scopus database, which made it possible to answer the research questions and meet the stated objective [28].

8) Data coding: in this section the information was systematized in Table 3 and 4, and it is possible to see the main researches that show significant findings in accordance with the actuality of the EGS agencies that disclose the way in which companies adhere to social responsibility with the sustainable investment indexes.

**Table 3. Principal documents manually coded 2023 - 2019.**

Year / Authors	Title	# citations	Categories and Keywords	Subject and technique	Convergent aspects
2023 [29]	The role of socially responsible investors in environmental performance. An analysis of proactive and reactive practices.	Recent date	Socially Responsible Investment (SRI) Dow Jones Sustainability Europe Index. Sustainable investments. Environmental practices.	A sample of 406 European listed companies was taken.	Stock index study based on sustainability. There is a link with stock market indexes, profitability and sustainable investment.
2022 [30]	Quantile time–frequency price connectedness between green bond, green equity, sustainable investments and clean energy markets.	69	Green bonds, green equities, sustainability indices, clean energy, yield linkage and quantile frequency.	Dynamic integration between sustainable investment index.	Study of stock market indexes based on sustainability and profitability. There is a link with stock market indexes, profitability and sustainable investment.
2021 [31]	Investor reactions to sustainability index reconstitutions: Analysis in different institutional contexts.	10	Corporate Social Responsibility (CSR). Sustainability indexes. Financial performance.	We analyzed 815 events between inclusions and exclusions from 2009 to 2017 in emerging markets.	Study of stock market indexes based on sustainability, Corporate Social Responsibility (CSR) and financial performance. Convergence between Corporate Social Responsibility (CSR) and stock market indexes.
2020 [32]	Sustainable investments in the Norwegian stock market.	14	ESG, financial performance, corporate social performance, portfolio strategy.	Norwegian stock data was taken on ESG factors from 2009 to 2018 using the Dow Jones Sustainability Index.	Dow Jones stock index study based on financial performance Corporate Social Responsibility (CSR) and ESG criteria. Convergence in the study of the index, Corporate Social Responsibility (CSR) and ESG criteria.
2019 [33]	Testing the Shared Value Business Model as a Driver of Change in Financial Institutions: Insights from Banks Listed on the Brazilian	1	Brazil. Sustainability index. Corporate social innovation Creating shared value in financial institutions. Global alliance for shared values. Sustainability index and Sustainable capitalism.	Analysis of Environmental, Social and Corporate Governance, Corporate Social Responsibility and Corporate Social Innovation to determine whether institutions generate Shared Value.	Dow Jones Brazil stock index study based on Corporate Social Responsibility (CSR), Corporate Social Innovation (CSI) and ESG criteria. Convergence in the index study, Corporate Social Responsibility (CSR) and ESG criteria.

Source: Compiled by authors based on Scopus.

**Table 4. Principal documents manually coded 2018-2013.**

Year / Authors	Title	# citations	Categories and Keywords	Subject and technique	Convergent aspects
2018 [34]	Corporate sustainability and value creation: the case of the "Dow Jones"	2	Dow Jones Sustainability Index; Corporate sustainability; Financial results; Financial results.	Case study to investigate corporate inclusion disclosure.	Study of the Dow Jones stock index based on financial performance and corporate sustainability. There is a link with stock indexes, profitability and sustainable investment.
2017 [35]	How can CSR identity be evaluated? A pilot study using a Fuzzy Expert System.	14	Corporate Social Responsibility. Fuzzy expert system(FES). rating agencies. Environmental Social Governance (ESG) Corporate Social Responsibility (CSR).	Multi-criteria evaluations of behavior and decision making elaborated through the Fuzzy Expert System algorithm.	Studies based on evaluations of CSR, CSR, rating agencies, Environmental and Social Governance (ESG). Convergence in the study of the index, Corporate Social Responsibility (CSR) and ESG criteria.
2016 [36]	Do sustainable companies have a better financial performance? A study on Brazilian public companies.	70	Corporate Sustainability Index. Corporate Sustainability Index. Economic and financial performance. Dow Jones Sustainability Index (DJSI).	Profitability and liquidity ratios were calculated using statistical tests.	Study of stock market indexes based on sustainability and profitability. There is a link with stock market indexes, profitability and sustainable investment.
2015 [37]	Sustainable investment in Korea does not catch a cold when the United States sneezes..	19	Socially responsible investment, Korea, political uncertainty, Crisis EGARCH.	Analysis of SRI performance in the Dow Jones Sustainability Index (DJSI) in Korea.	A study of the Dow Jones Korea stock index based on socially responsible investment. Convergence between Corporate Social Responsibility (CSR), stock market indexes and socially responsible investment.
2014 [38]	Socially responsible investments: An international empirical study of time-varying risk premiums.	4	Socially responsible investing; Corporate social responsibility; Time-varying risk premiums.	Analysis of the performance of the Dow Jones Sustainability Index (DJSI) in the US, Europe, Asia/Pacific Weekly data.	Study of the Dow Jones US, Europe, Asia/Pacific stock index and Socially Responsible Investment (SRI) Convergence between Corporate Social Responsibility (CSR), stock market index.
2013 [39]	Socially Responsible Investment and cleaner production in the Asia Pacific: does it pay to be good?.	75	Socially Responsible Investment (SRI). Environmental, social and ESG governance. Dow Jones Sustainability Asia Pacific Index (DJSI-AP).	Performance analysis of the Dow Jones Sustainability Asia Pacific Index (DJSI-AP) Best in Class investment approach.	Study of the Dow Jones Asia Pacific Stock Index and Socially Responsible Investment (SRI) and ESG criteria. Convergence in the study of the index, Corporate Social Responsibility (CSR) and ESG criteria.

Source: Compiled by authors based on based on Scopus.

9) Encourage critical development: in this section, the information is analyzed to answer the questions. The Structured Literature Review (SLR) takes into consideration the number of documents disclosed and the most cited writers with the intention of representing the progress of the inquiry [16] (Dumay, 2014). These responses are shown in Figures 1, 2, 3 and 4.

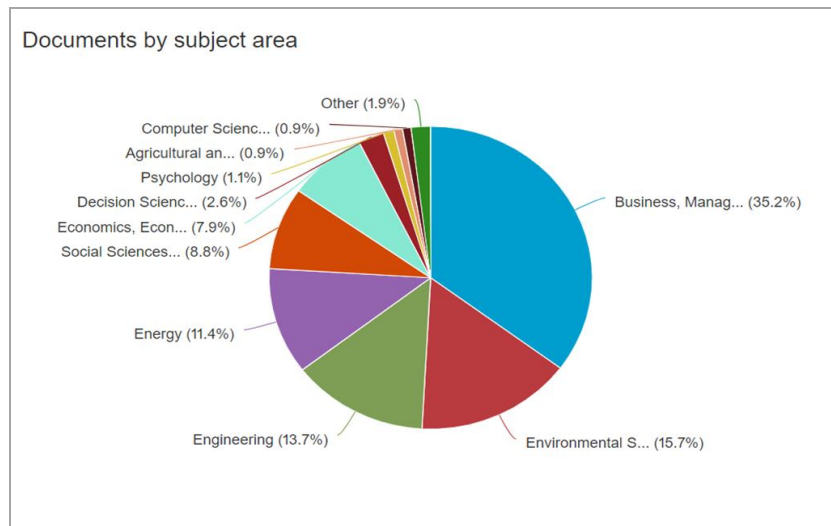


Figura 1. Classification of documents by scientific area, based on Scopus.

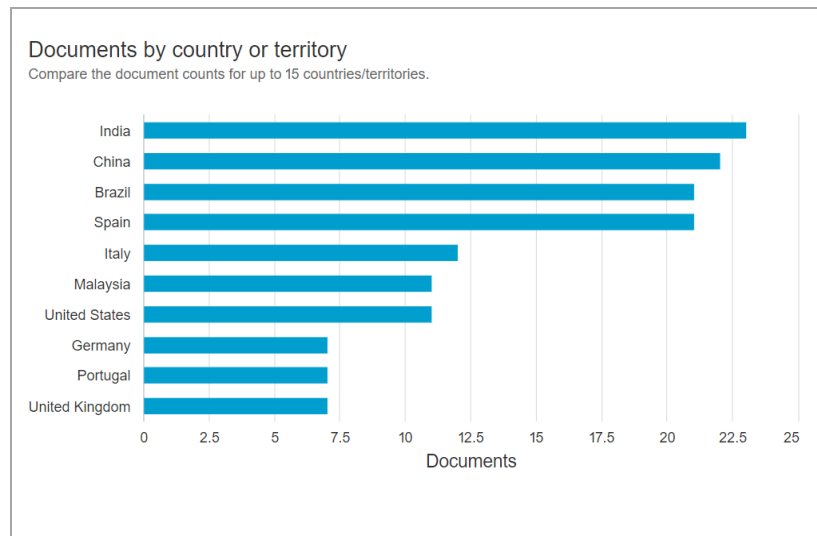


Figura 2. Ranking of documents by country, based on Scopus.

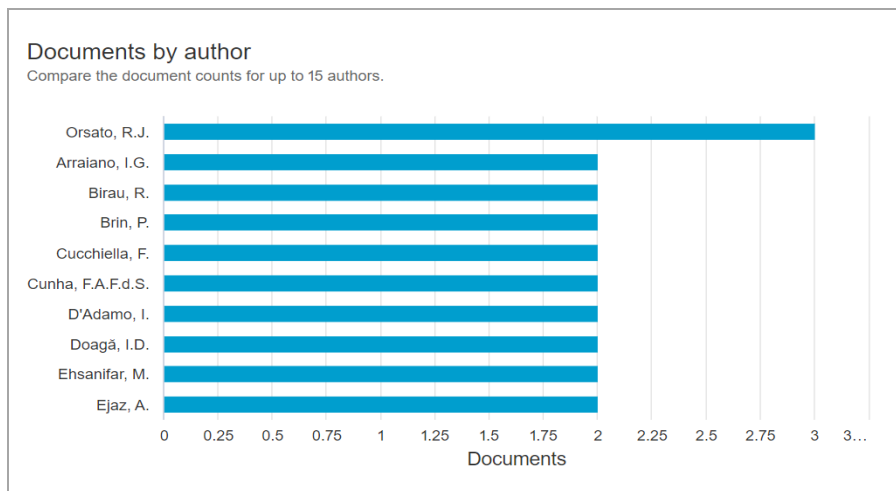
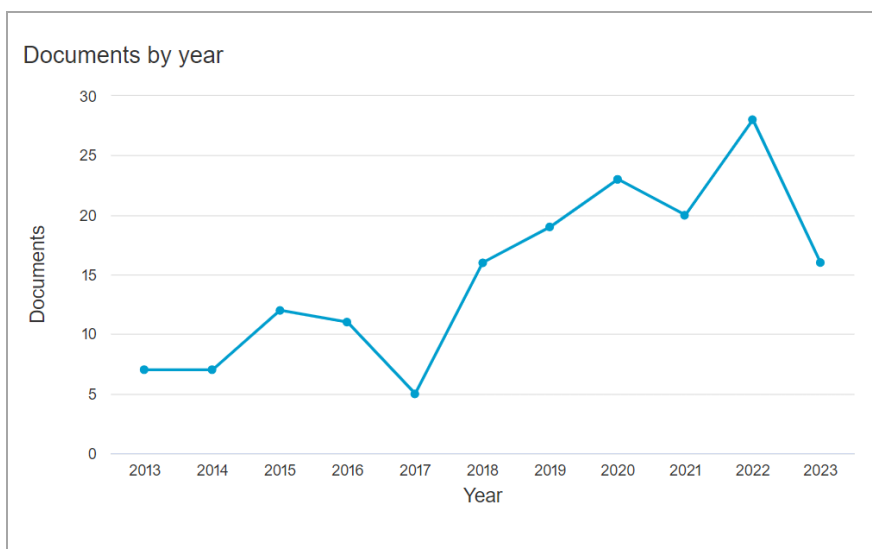


Figura 3. Classification of documents by author, based on Scopus.



**Figure 4.** Number of documents by year, based on Scopus.

10) Generation of new knowledge: likewise, the answers to the questions lead to the deepening of the study when it has been possible. It was observed the growing boom of scientific research interested in knowing the form and methodologies used by ESG agencies to measure sustainability in companies worldwide. In this regard, there is still a gap due to the differences between ESG agencies, which do not have a standardized basis to help understand their assessment of the different types of companies. However, recognition is also given to the joint effort in creating valuation criteria for sustainable investment indices, although they are different for each ESG according to the type of company they have to measure. Due to these divergences, it is recommended to continue the research progress in order to provide a path towards measurement concepts that can be standardized according to the nature of the types of companies, which should be previously classified as follows.

## CONCLUSIONS

From the manual categorization, it became evident that there is a correlation between the writers who converge in the management of stock market indexes, profitability and sustainable investment [29] [30] [34] [36]. Other authors present convergence between Corporate Social Responsibility (CSR) and stock market indexes [31] [37] [38]. In this order of ideas, we also found authors that have Convergence in the study of the sustainable investment index, Corporate Social Responsibility (CSR) considering ESG criteria [32] [33] [35] [39]. The development of this research highlights the importance of sustainable investment in organizational practices in the last ten years. In this way, it was possible to recognize the Systematic and Structured Literature Review (SLR) [3] offers a reliable way to distinguish what companies do to achieve sustainability, based on the evaluations of ESG agencies worldwide. This SLR methodology refers to an instrument that allows multiple meanings of a detailed exploration to be analyzed. In addition, the tactics for Sustainable and Responsible Investment (SRI) have shown significant growth due to the measures that have been taking against the criteria for environmental, social and governance (ESG) investment [8]. Therefore, researchers join the joint global actions to review the causes and consequences of climate change, with the aim of disseminating the problem. All this leads to making companies more competitive with a value for investors of this type [10].

Estos activos intangibles deben estar representados por índices bursátiles que muestren empresas verdaderamente responsables con el medioambiente. La responsabilidad y sostenibilidad empresarial repercute a la nación y es pertinente a todos sus habitantes. Por esta razón, los gobiernos deben incentivar el sentido social responsable de manera más convincente. Los planes de gobierno deben atender con mayor vigor las prioridades la inversión socialmente responsable. Se pudo constatar que se han realizado esfuerzos para abordar la sostenibilidad con las inversiones sostenibles y garantizar un mejor ambiente para las generaciones futuras. Resulta de gran importancia a nivel mundial, que las empresas se comprometan con las inversiones sostenibles y



que se promuevan estas acciones en los bienes públicos y privados. Esto incluye la responsabilidad corporativa y el beneficio financiero para los socios [14].

La Comisión Europea establece que las finanzas sostenibles se orienten a disposiciones específicas de inversión. Con esta intención se busca la consideración de los factores ambientales y sociales, que son cruciales para lograr objetivos y actividades sostenibles para minimizar el cambio climático, la contaminación y los peligros de desastres naturales. La estandarización de los indicadores institucionales ESG podría ser un posible camino para seguir [16] [40]. Los artículos del año 2023, debido a su fecha tan reciente, todavía no reflejan citaciones. Sin embargo, la temática sigue teniendo gran interés en este año 2023 con el estudio de las inversiones sostenibles, lo cual se ha dejado con numerosas publicaciones hasta mediados de este mismo año.

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