Systematic literature review of interconnection between Corporate Social Responsibility, Green/ Eco-innovation, and Performance

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Abstract: - Corporations and enterprises of different sizes are growing and evolving in many nations, but their impact is not only on the increasing economies but also on destroying all the natural resources and increasing the world's consumption and waste. In recent years there have been many issues concerning how companies should operate taking into consideration not only the corporate social responsibility but also the latest concepts about green/eco-innovation and their impact on the company performance, including financial performance, non-financial performance, and environmental performance. In this article, the author analyzes a total database downloaded from Scopus of 149 articles written by 389 authors, in 78 different journals, from 2011 – 2024 using the four keywords: "CRS, green innovation, eco-innovation, and performance”. The main purpose of this study is to summarize and analyze the three main questions which are “How are interconnected Corporate Social Responsibility, Green/Eco-innovation, and Performance?”, “What are the key findings in CSR, green/eco-innovation, and performance? “What were the common variables and methods used by authors to develop their research? The research discusses the current status and latest trends in CSR, green innovation, and performance. The titles and abstracts were manually scanned. Articles with missing data and unrelated to the research's main questions were deleted from the list. The final list examined by the author is 135 relevant journal articles. In conclusion, in major cases, CSR is strongly related to performance, by the mediator effect of green/eco-innovation.

Key-Words: - Corporate Social Responsibility, Green innovation, Eco-innovation, Financial Performance, Non-financial performance, and Environmental performance.

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1 Introduction

According to the Investment Policy Framework for Sustainable Development (2015), [1], policymakers are considering a new development paradigm that prioritizes sustainable development goals next to economic growth, considering the global political and economic context and addressing social and environmental concerns. Governments are aggressively promoting sustainable development, including encouraging low-carbon foreign direct investment. Corporate accountability is being prioritized through the promotion of private codes of conduct. Researchers have used CSR for decades to investigate financial performance, [2]. However, in the last few years, there has been an increase in the investigation of CRS and green innovation and how they impact performance.

Adopting CSR increases corporate value and predicts higher long-term operating profits. Implementing CSR helps businesses to increase their environmental and social performance, particularly in terms of the environment and local communities, thereby increasing company governance and influence on society and the natural environment, [3], [4] analyzed the effect of corporate social responsibility and green innovation on business competitiveness in the manufacturing industry in Ecuador. According to their study, corporate social responsibility and green innovation have a positive correlation with corporate competitiveness. Green and Eco Innovation can impact the companies' reduction of energy consumption and proper use of resources leads to an increase of productivity, [5] investigated the impact of CSR on green innovation, environmental strategy, and companies’ performance. This study demonstrates a positive correlation between corporate social responsibility and green innovation.

Because corporations profit from society and the environment, they must take their duties seriously by adhering to societal values and conventions. Businesses are committed to

embedding social and environmental sustainability into their decision-making processes and corporate cultures to support corporate social responsibility and green innovation efforts. This demonstrates a long-term commitment to social ideals and standards in the new period. As a result, performance remains consistent throughout time. To achieve this goal, this research intends to answer the following research questions:

RQ1. How are corporate social responsibility, green/eco-innovation, and performance interconnected?
RQ2. What are the key findings in CSR, green/eco-innovation, and performance?
RQ3. What were the common variables and methods used by authors to develop their research?

2 Literature Review

2.1 Corporate Social Responsibility and Company Performance

Today's developments, especially after the announcement of the UN's Sustainable Development Goals plan, [6], have highlighted the urgent need for quality of non-financial information, to integrate it with financial information. To maintain profitability, companies are increasingly accountable to stakeholders, taking sustainability into account; becoming aware of societal concerns, complying with international laws and regulations, and adopting international approaches such as the Sustainable Development Goals, which allows them to remain profitable, [7]. Environmental sustainability is a big issue for the corporate world, and many developing and industrialized countries have been put into awareness of their responsibilities in environmental deterioration, which causes economic, environmental, and social problems, [8].

CSR helps to improve the well-being of society and the environment. CSR defines a firm's sense of duty to the global community while also increasing its performance. Research shows that eco-friendly practices improve corporate performance, [9]. As environmental concerns grow, companies must prioritize CSR to attain green sustainability in a way thatprotects the environment, [10]. Corporate social responsibility is the most adequate instrument that helps governments create a safe business environment, [11]. Ethics standards and principles and corporate social responsibility have decreased the impact of air pollution by promoting eco-friendly production practices and boosting environmental performance, [12], [13], stated that CSR represents corporate fulfillment in promoting community welfare, producing environmentally businesses, and impacting on economic advancement, which identifies CSR objectives such as sustainable development and meeting stakeholder perspectives and values. The research [14] shows that CSR actions can help preserve the environment. Companies that aspire to deliver environmentally friendly results must prioritize corporate social responsibility (CSR) for the environment.

According to [15], corporate social responsibility is a positive indicator when it comes to fulfilling its social and environmental obligations in such a way as to increase the trust of stakeholders. A customer is more loyal to a specific product or service if they see that the company is transparent and respects the consumer's rights. The government can finance the company with grants and the banks/financial institutions can approve loans at lower interest rates for companies with a better reputation. On the other side employees can be more productive in their work if their rights are respected and they feel that are part of a company with higher visibility and a good reputation. All increased stake-equity confidence not only increases the value of the company in non-financial terms (reputation, image, etc.) but also has a positive correlation with financial performance. This linkage between corporate social responsibility and corporate financial performance is slightly stronger for companies that are more driven to engage in CSR activities to improve not only financial performance but also, their reputation and their company value.

In the study of emissions, which was conducted on 4,533 US companies, extracted from Standard & Poor's database from 2004 to 2013, they found that CSR impacts in five ways the organization's increasing strategies in long-term orientation, increasing and creating firm value and good reputation, increasing initiatives in social and environmental pillars, reducing carbon emissions, and increasing the adoption of green innovations. The study by [16] on Spanish companies, found a positive correlation between a firm's corporate social responsibility (CSR) and environmental practices. Mandatory CSR reporting enterprises exhibit significantly superior green innovation performance compared to non-CSR reporting firms, [17].

According to [5] and [18], the researchers show that there is not always a clear link between CSR and performance. In most cases, this connection is

justified by a mediator variable that justifies interconnection between them. As a result, some scholars argue that mediating variables could be important in assessing CSR and firm performance, [19], [20].

Based on the analysis of, [21], the choice of "green innovation" as the mediator variable proves that corporate environmental responsibility has a direct impact on business performance. For many businesses, having a proactive corporate environmental responsibility culture is quickly turning into a source of competitive advantage. The results of [22], demonstrate that there is a linkage between environmental practices and company social performance by the mediating variable of green innovation and corporate image. According to the study they highlight the role that green innovation and corporate image play in improving a firm's social performance.

Finally, based on the study by [23] conducted on 119 companies in China, the authors mention that companies should prioritize CSR for long-term goals and integrate it into the strategy because positively impacts performance and in the short term has a big impact on return on assets.

2.2 CSR and Green Innovation or Eco-innovation

The research of [24] mentions that the linkage between green finance, CSR, and environmental performance is possible only from green innovation mediates variable. Green innovation is the most important factor influencing how successfully companies protect the environment, followed by CSR and green finance, in improving environmental performance by reducing carbon emissions and energy consumption, as well as providing green training to employees on energy and paper savings. The study of [25] found that corporate social responsibility activities improve green innovation performance and have a positive impact on the managerial environment.

Based on existing literature, CSR is identified as a firm's capability that can impact performance through green innovation. As firms become more aware of the risks of environmental degradation and pollution, they prioritize ecological protection and adopt environmentally friendly products and processes to achieve higher performance and market share, [26].

According to [27] suggest that enterprises can increase their productivity by developing and implementing green policies and technology to produce new eco-innovative products and processes that improve financial performance. [5] found that effective CSR activities can improve green innovation and from these, the company decreases operational costs and increases the benefits of businesses, [19].

In the study of [28], in their research, they mention three findings. The first one is that they validate the fundamental function of green innovation in CSR-financial success linkages. To establish a solid business reputation, businesses should proactively address their stakeholders' social and environmental issues and include them in their plans and strategies regarding green innovation. Second, the findings show that green dynamic capabilities strongly mediate the linkage between CSR and green innovation. Industrial businesses should focus on improving their "green" dynamic capacities, to boot green innovation. Thirdly, the study's findings show that the association between green innovation and financial performance deteriorates in a non-stable environment.

The findings indicate that perceived environmental instability prevents CSR's relationship with financial success through green innovation.

They discovered that CSR-related techniques that involve both external stakeholders such as (the environment, and the community) and internal stakeholders (employees, management, and shareholders) significantly increase environmental performance, and green innovation partially mediates the external (environment) to environmental performance. Environmental performance is influenced by the green impact of eco-innovative products, and eco-innovative processes, that find new ways of resource allocation in a way that exceeds legal requirements, [29]. The study of [30] examined how corporate social responsibility might improve company performance by integrating the community into sustainability efforts and analyzing how green innovation mediates the link between corporate social responsibility and companies' performance.

2.3 Green Innovation, Eco-innovation and Performance

"Green innovation" or "Eco-innovation" is a process that helps the development of new products, processes, and technology to decrease environmental risks such as air, earth, and water pollution and decrease the use of natural resources, [31]. Green innovation is defined by [32] as a product/service or process innovation, in the cycle of business to find a way reduction of pollution, environmental threats, and other adverse effects of natural resources. The European Commission

(2011), [33], [34] defines eco-innovation, [35] as "all forms of innovation to encourage business to implement environmental technologies or any kind of eco-friendly innovation such as in process and in the product". [5] underlined that innovation in the sense of green innovation and technologies is the application to reduce wastage, global warming, and the allocation of natural resources. In the study of [36], they found that green innovation has a substantial impact on organizations' eco-friendly development and that invention patents boost firms' ability to develop sustainably, while non-invention patents have little impact on green innovation.

The studies of [37] mention that there is a strong impact of social cooperation initiatives on companies' performance by implementing green innovation in strategy plans. Particularly after CSR application, with the focus on social issues and environmental innovation helps companies to reduce social and environmental problems by involving external and internal stakeholders in CSR activities such as reducing hazardous emissions, producing eco-friendly products, and biodegradable products taking into consideration recycling and proper use of natural resources. Based on the research of [38], green innovation, green capacity, environmental strategy, and green transformational leadership help CSR to achieve environmental performance because has no direct impact on the performance. In a study conducted by [39], research indicates that companies with a strong focus on environmental applications have notable financial performance. This suggests that companies should give priority to their green investments in order to enhance innovative outcomes, get higher financial returns, and engage with future environmental stakeholders. Also, in the study [40], the author investigates the impact of CSR on environmental performance.

Green innovation boosts financial success in two ways. First, organizations that give priority to eco-innovation, understand that eco-innovation gives benefits in the form of improving production and productivity through eco-innovative processes, producing more innovative products/services, by lowering operating costs, [41]. Secondly, by distinguishing themselves from possible, [42] competitors, by building a good reputation and legitimacy, increasing their worth and revenue. Also, several researchers have found a correlation between green innovation and financial performance. According to [43], green innovation impacts positively to financial performance of China's companies.

Green innovation plays an important role in improving a firm's financial and environmental performance. Policymakers of every country should prioritize sustainable investments in adopting innovative products and services and attract environmental stakeholders. Supported by the research of [39], at the national or regional levels, governments are already making significant advances in encouraging environmental innovation. However, they should take into account policies that promote the adoption and application of green innovation, as well as those related to tax incentives, to motivate businesses to start implementing green innovation infrastructure. As per [44], the conclusion mentions that green process innovation has a positive correlation with green product innovation, and they both impact a company's financial performance. In their study green product innovation as a mediator variable links green process innovation with a company's financial performance. In the study of [45], they conclude that one important mediating factor in improving the supply chain's performance is its capacity to accept green technology innovation, [46] by adopting green process innovation and green product innovation. Businesses can become more competitive, by adopting these technologies, that fit market changes and achieve long-term, sustainable growth.

Green innovation in many recent studies has not only been seen as a green technology that can be adapted only to companies that produce goods but also to companies that provide services. A study by [47], mentions that the purpose of his article is to provide evidence for the green practices of global banks as one of the most successful ways of promoting the adoption of resource-saving innovative technologies, environmental program implementation, and implementing the best corporate social responsibility principles.

In general, in many studies, there is a positive correlation between CSR and performance, mediated by green innovation (Table 1), but in the research of [42], economic and environmental performance may interact peacefully as long as the right laws protect the environment are in place. These results may cause people to reconsider the sensible investment of radical green innovation, and the connection between environmental and economic performance. In general, there is a positive correlation between CSR and performance but in some cases, this connection is not justified. For example, the result of [48] finds that there is no correlation between corporate social responsibility, green innovation, and firm success.

Table 1. Green/eco-innovation as a mediator between CSR and performance

Researchers	Key finding
[5], [18], [24], [25], [30], [37], [38], [40], [49], [50], [51], [52], [53], [54]	In many studies, green/eco-innovation is seen as a mediator between CSR and environmental or financial performance.

Source: Author

All the studies analyzed in this article show whether there is a positive or negative link between CSR, green innovation as a mediator variable and performance. Only in the research of [55], they identified a parabolic link between CSR involvement and social reputation instead of linear regressions. This suggests that CSR performance should rise to a certain degree to establish a social reputation and then decline to a level that can decrease financial performance because of the cost and the lack of financial resources.

3 Tools and Methodology

According to [56], a systematic literature review is regarded as an appropriate and rigorous way to analyze the current state of a researched issue and to identify prospective future research topics. To avoid bias in the results and enable process reliability, the systematic literature review conducted in this study is based on manual filtering. This approach, as compared to automatic filtering, enables writers to recognize, classify, and summarize each significant contribution through an open review procedure, [57].

The author analyzes a total open-access database downloaded from Scopus only English language of 149 articles written by 389 authors, in 78 different journals, from the period 2011 – June 2024 using the four keywords that are, "CSR" and "Eco Innovation or Green Innovation as synonyms" and "Performance". The articles were manually scanned. Articles with missing data, no sufficient information in the abstract, no access to the full paper, and no clear definition related to the three questions of the research were deleted from the list. The final list examined by the author is in total of 135 relevant journal articles.

The descriptive findings, which are summarized in Table 2, were found for each publication based on preliminary analysis. These descriptive findings include (theoretical, empirical), main conclusions, instruments for data collection, methodology, nation, most cited authors, top 8 journals, how keywords are co-related, and the most used mediators/moderators' variables. In different scientific research, the author identifies that the keywords "CSR, Eco or Green Innovation and performance" can be found in the position of the independent variable, moderator, or mediator. The mediator and moderating variables, as well as their role in the relationship between CSR and performance, were examined by the author through a manual examination of the literature. The primary issue with this process is that there is no clear justification for the selection of a moderator over a mediator or vice versa. The statistical results, variables, and effects included in the models are compared and summarized based on the data processing in the Excel file.

Table 2. Data retrieve information

Data retrieve information	Details
Retrieval Time	June 2024
Data Source	Scopus Database
Retrieve Topic	"CRS", "Green innovation" "Eco-innovation", "Performance"
Relevant	All full papers in the English language, that include the terms below in the same paper
Articles	127 Empirical and 8 Literature Review

Source: Author

Applying the keywords, Scopus filters, and full-text reading, the publications were chosen to be included in the analysis at the start of the review process. A descriptive diagram is shown in Figure 1.

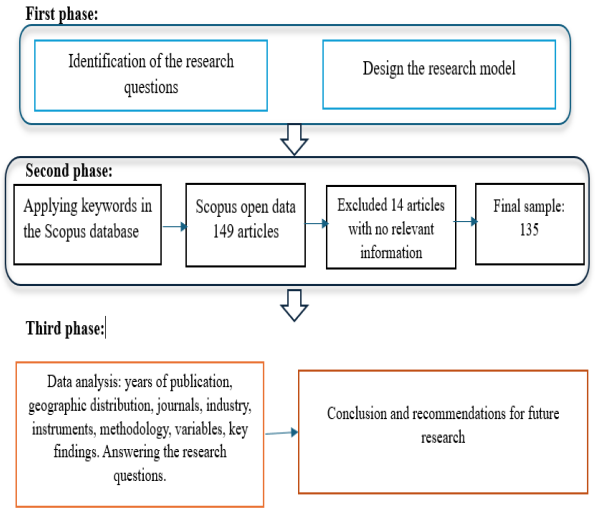

Fig. 1: A descriptive Diagram of systematic literature review
Source: Elaborated by the author

4 Results and Analysis

4.1 The Descriptive Analysis

4.1.1 Publications over the Years

The first finding is that the number of publications has increased exponentially since 2020, with the highest value in 2023, because the data in the article were extracted in the middle of June 2024. This implies that academics are paying more attention to this area of research after COVID-19, and it is reasonable to expect that this trend will continue in the future. During the change in legislation about environmental issues, like the Paris Climate Agreement, [1], [6], [58], more countries' focus was on climate change and environmental concerns, as more people realized that environmental deterioration may cause global system disruption in the same way as a pandemic. Paris Agreement requires social and economic change and focuses on a five-year cycle of nations' climate action. Nationally determined contributions (NDCs), [59], or national climate action plans, have been submitted by nations since 2020.

The Paris Agreement's, [58] objectives include an increase in climate change action and low-carbon solutions. Companies are increasing awareness of global climate goals and are motivated to develop new technologies for eco-innovative processes and products. The Paris Climate Agreement works as a catalysator for companies to adopt CSR practices, invest in eco-innovative technologies, and improve environmental performance to align with global climate goals. The interest in eco-innovation, CSR, and other related solutions has increased in this situation. Please refer to the trends in the last years in Figure 2.

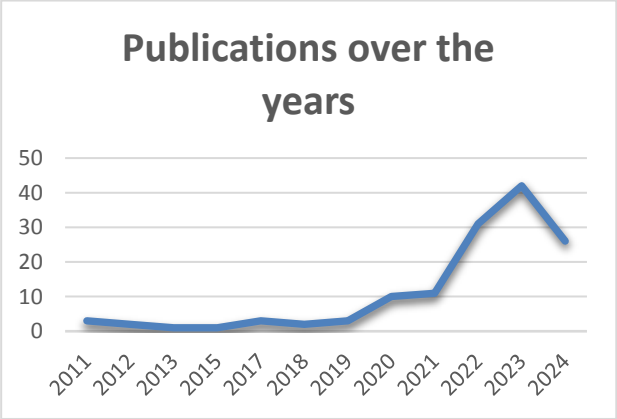

Fig. 2: Scientific articles about "green innovation" or "eco-innovation", “CSR”, and “Performance” in Scopus (n=135)
Source: Author

Based on the Chi-Square Test for yearly publication distribution, the calculations are given in Table 3.

Table 3. Observed counts articles for Each Year

Years	No. of Articles for the year
2011	3
2012	2
2013	1
2015	1
2017	3
2018	2
2019	3
2020	10
2021	11
2022	31
2023	42
2024	26

Source: Author

Expected Count for each year:

$$\boldsymbol{Expected\ Count = Total\ Articles / Number\ of\ Years}$$
$$= 135 / 12 \approx 11.25 \quad (1)$$

Applying the Chi-Square formula:

$$\boldsymbol{\chi 2 = \sum (Oi - Ei) 2 / Ei} \quad (2)$$

where:

- $\chi 2$ = Chi-Square statistic
- Oi = Observed frequency for each year
- Ei = Expected frequency for each year
- $\chi 2 \approx 179.13$

Determine the Degrees of Freedom:

$$\boldsymbol{df = k - 1} \quad (3)$$

where k is the number of years, which means: 12−1=11

A chi-square statistic of around 179.13 is extremely large, indicating that the p-value is much less than 0.001, indicating that the increase is statistically significant. The p-value is less than the standard threshold of 0.05, suggesting that the increase in publications since 2020 is statistically significant.

4.1.2 Journals

Journals with the highest number of articles published that are among the most popular journals about CRS and eco or green innovation are given in Table 4.

Table 4. The top eight journals in the research items

The most used Source of publication (Journals)	No. of Articles
Sustainability	20
Corporate Social Responsibility and Environmental Management	7
Environmental Science and Pollution Research	6
Business Strategy and the Environment	5
Journal of Cleaner Production	5
Energy Economics	4
Economic Research-Ekonomska Istrazivanja	3
Technological Forecasting and Social Change	3

Source: Author elaboration

Expected Count for each journal:

$$\boldsymbol{Expected\ Count = Total\ Articles / Number\ of\ Journals}$$

$$= 135 / 78 \approx 1.73 \quad (4)$$

Applying the Chi-Square formula:

$$\boldsymbol{\chi 2 = \sum (Oi - Ei) 2 / Ei} \quad (5)$$

where:

- $\chi 2$ = Chi-Square statistic
- Oi = Observed frequency for each journal
- Ei = Expected frequency for each journal
- $\chi 2 \approx 256.27$

Determine the Degrees of Freedom:

$$\boldsymbol{df = k - 1} \quad (6)$$

where k is the number of journals, which means: 78−1=77

After the calculations, the p-value for a Chi-Square statistic of 256.27 with 77 degrees of freedom is extremely small, typically less than 0.001, suggesting that the distribution of articles is not uniform, and some journals have published more articles than others.

4.1.3 Geographical Distribution

It is evident from the examination of the geographic distribution of the literature on CSR, Green Innovation, and performance most of the publications are concentrated in China, Pakistan, Spain, and Italy as shown in Figure 3.

4.1.4 Most Cited Authors

Key scholarly contributions have significantly influenced the fields of corporate social responsibility (CSR), performance, and eco / green innovation. Among the most cited works please refer to Table 5 (Appendix).

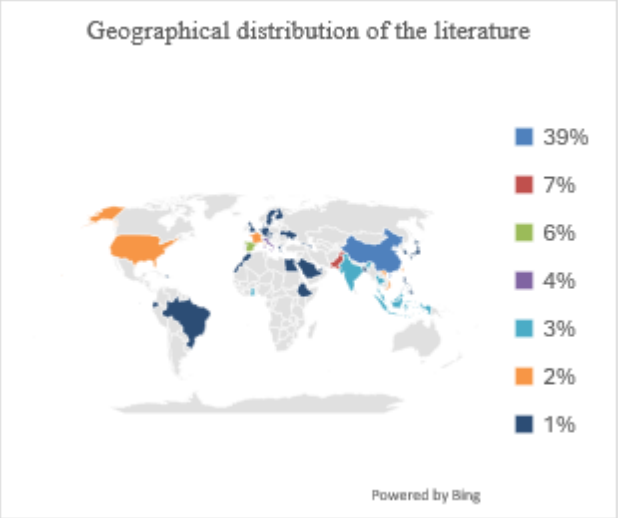

Fig. 3: Geographical distribution of the literature
Source: Author

4.2 The Bibliometric Analysis

To visualize the relationship between the main keywords in the articles that are analyzed, the author applies the Vosviewer software developed by [62], who give particular attention to how bibliometric maps are represented graphically. The links between terms provide the study's best idea, which is determined by bibliometric analysis that summarizes conclusions based on quantitative data.

In the beginning, the data of the articles that were extracted from Scopus are analyzed in a TXT file containing: bibliographical information, abstract and keywords, etc. The author chooses a minimum number of repetitions of keywords at 5 and the tool extracts 178 repeated keywords. After that, the keywords that were not related to the research question were checked manually and were excluded and finally, the keywords were subject to interpretation.

As seen in Figure 4, the analysis showed that the most common theme is green innovation performance, (marked with blue in Figure 4 which is related to the main keywords as knowledge management or knowledge, government, CSR activity, corporate governance, or stakeholders' theory.

There is a significant concern for companies in finding ways to adapt and apply new technologies effectively. Companies and researchers should increase their focus on the importance of developing capabilities related to knowledge management, reskilling, and up-skilling of human resources on approaching technological advancements.

The second center in the map is eco-innovation (marked with red in Figure 4) is related to the main keywords as knowledge management, social, CSR performance/practice/activity, resources/natural resources, governance, community, society, and corporate sustainability. Eco-innovation is strongly related to CSR practice/performance/activity, which means that companies with a strong focus on society and the environment not only on financial performance, tend to develop innovative solutions that benefit society and the environment which they operate. Eco-innovation in process and product tends to make companies competitive in the market and at the same time contribute positively to society. When we focus on knowledge management, companies who invest more in knowledge through training, sharing best practices, and enabling the culture of learning in the companies tend to be more innovative in adopting easily new technologies.

The third center is the organization (marked with green in Figure 4) that is connected to resources, green human resources management, environmental strategy, green products, green transformational leaders, climate change, environmental protection, directors, state, and government. All the connections suggest that there is an increase in focus on resources to support sustainability initiatives, also GHRM integrates green practices into human resources policy.

Environmental strategy refers to the increase of the focus of companies to strategic plans that prioritize environmental sustainability by the development of environmentally friendly products (green products) and taking actions on implementing policies that address environmental challenges. In terms of green transformational leaders, there is an increase in the need to find leaders who play a critical role in driving green initiatives, and in the end, the three keywords such as director, state, and government mean that laws and regulatory frameworks impact directly how organizations behave influenced by government policy related to sustainability.

The analysis also showed that if you focus on the middle of the map, the keyword knowledge is related to all the other parts of the map.

As per [63], strong absorptive capacities enable organizations to employ the newest technologies while transformative capability is equally vital, and most businesses have achieved this through applying knowledge to solve challenges in daily operations. In the research of [64] investments impact the effectiveness of green supply chain innovation, offering new perspectives on knowledge transfer. The findings in the study [65] indicate that responsible green innovation positively correlates with knowledge transfer and green transformational leadership and that responsible green innovation also positively correlates with environmental, economic, and strategic performance dimensions.

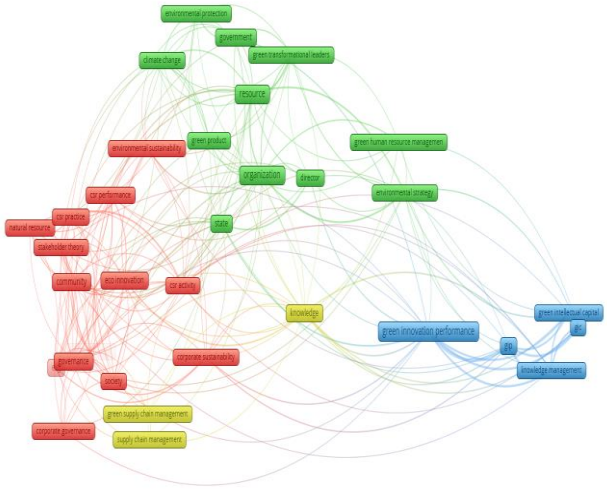

Fig. 4: Network visualization in the bibliometric analysis
Source: Processed by the author with Vosviewer software, [62]

There is a lack of a literature review from the extracted article about the concepts and definitions of knowledge of even green skills. For example, knowledge of new technologies, adopting new technologies, skills that human resources need on adopting new technologies, etc. Nobody talks about that, and this is mandatory for the succession of the companies to adopt new green infrastructure. The 2022 proposal from the European Commission, [66] recognizes that, despite increasing environmental focus in many policies of EU countries, there is a failure to implement environmental legislation. While data from UNESCO, [67] in 2023 shown in the GEM Report, 62% of countries lack laws, policies, and strategies for climate change education. There is an urgent need to raise awareness of the environmental knowledge base [66], fostering green skills and continuous training. No one talks about knowledge transfer after training, education, and gaining green skills, and how they will help employees adopt new technologies and increase eco-innovation in their company.

4.3 Instruments, Methodology and Variables

The most used data collection methods are questionnaires and surveys. The big data in many cases were retrieved based on databases, such as the Thomson Reuters Eikon database [68], SABI

database [16], Orbis Europe database [69], China Stock Market and Accounting Research Database [15], [70], [71], CSMAR and HEXUN databases [23], [72].

In the other cases, they utilize stock exchange databases such as, [73], USA, iShares MSCI KLD 400 Social Exchange, Indonesia Stock Exchange, [30] & [47], Pakistan Stock Exchange (PSX) [14], Shangai & Shenzhen Stock Exchanges [18], [74], [75]. The author can state that the major databases used are from China because most of the articles in this research are with samples from China. One of the reasons is that due to China's rapid industrial growth, the country has faced substantial environmental concerns such as air and water pollution, deforestation, and greenhouse gas emissions. As a result, environmental issues and innovation have received a lot of attention, as evidenced by the rise in the innovation environment index, [76].

Also, China's government has implemented strict environmental regulations such as policies like the 14th Five-Year Plan, [77] (2021-2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035 with a focus on sustainable development and innovation in green technologies, such as encouraging researchers to focus on eco-friendly innovations.

In general, the main methodology used in the research in a way to obtain results is using partial least squares structural equation modeling because of the complex relationship between independent variables, mediator's and moderator variables, and dependent variables.

Table 6 (Appendix) analyzes and summarizes all the key variables and how they are interconnected in this research.

Based on Table 6 (Appendix), the variables of this study can be found in several positions. But in the most common cases, CSR is in the position of an independent variable, performance is in the position of a dependent variable, and in the majority of cases, the interlink between them is possible through a mediator variable which mostly is eco-innovation. Although in general there is a positive correlation between CSR and performance, in the study of [88], in the short term, CSR has a negative impact on financial performance, due to initial investment, and an increase in operational cost but in the long term, this correlation is positive.

For example, in the study of [5], which was conducted in 297 large corporations in Malaysia, the researchers concluded that green innovation significantly improves environmental performance and mediates between CSR and environmental performance. In the study by [28], which was conducted in Pakistan, and distributed to 1341 manufacturing firms, in total collected 687 questionnaires from managers, they concluded that there is a strong relationship between CSR and financial performance mediated by green innovation. A sample of 253 companies taken from Indonesia Stoch Exchange, [30], identified that CSR has a positive correlation with firm performance, and the mediate variable is green innovation, [49], investigated in a total of 906 manufacturing and service companies in China, India, Pakistan, Bangladesh, and UAE countries, showing that green innovation as a mediator strongly impacts the relationship between CSR and organizational competitiveness.

Except for the variables mentioned in Table 6 (Appendix) in this study, key variables such as government incentives (tax incentives) or government regulation and laws, green human resources management, and dynamic capability are identified. These variables have a direct or non-direct impact on CSR, eco-innovation, and performance. In the research the government incentives are mentioned in the study of [89], in which the result is a stronger political incentive, there is a positive impact of the green innovation behavior of the enterprises in the area, and the stronger the corporate social responsibility from the company in the governance, shows an increase of political incentives for the respective company.

Not only incentives but also the strict regulations and laws of many governments around the world need to analyze the way they affect companies' performance. According to [90], under the right environmental rules and laws, economic and environmental performance can grow on the same path even the fact that to achieve environmental performance the company should invest and increase the operational cost in total this impact decreases the amount of financial performance.

These results might cause businesses and researchers to reconsider the balanced and sustainable growth of green innovation, and to reconsider the connection between environmental and economic performance. To encourage businesses to engage in innovation, the government should implement varying environmental regulation rules, [91]. However, when businesses are subject to rigorous environmental regulations from the government, they adopt more green innovation technologies, [92]. Also, the government adopts environmental tax, as per the research of [86], the

tax positively affects corporate green innovation but has a negative impact on companies' performance.

Few studies imply green human resources management (GHRM) in the research model, but to adopt new technologies the employees should gain some skills and have the willingness to learn. In the study of [93], GHRM was found to be a significant predictor of environmental performance by stimulating employee creativity in creating environmentally friendly products and discovering innovative ways to operate more sustainably to raise the environmental performance of the company. Companies should invest in training programs on improving skills and reskilling human resources for eco-innovative technologies. Researchers on the other side should increase their focus on training, green skilling, and the impact of the model.

5 Conclusions & Recommendations

After conducting all the research one of the main conclusions is that there is an urgent need for more papers and studies about the critical point in which a company should invest in CSR, in a way that the investment should not decrease financial performance.

- Researchers should focus more on how much a company should invest in CSR and green innovation in that point that this cost does not affect financial performance. Also, they should study if a certain financial subsidy or government incentive would positively impact the performance.
- Businesses should invest in systems for internal assessment for the optimal level of investment in CSR.

Not only incentives but also environmental regulation and tax impacts in the level on how much green are the companies. In many countries, they are still adopting new regulations and ways of reporting regarding CSR.

- Companies should anticipate and adapt to evolving regulations related to environmental and social responsibility. Complying with regulations not only mitigates risks but also gives the companies one hint of being more competitive in a global market by adopting new green technologies.
- Researchers should conduct more studies on environmental regulations and laws that impact the companies' performance.
- Governments should implement incentive programs and take institutional and administrative measures to create institutions for continuous monitoring of the environmental performance of the companies.

Nobody talks about incentive salaries or bonuses to the managers or employees for adopting new green technologies or adopting green processes and products. Few of them talk about employees' green training, like in the study of [94], the research indicates that corporate sustainability performance is strongly connected with green training due to the indirect impact of green innovation behavior.

- Companies should increase the level of training initiatives on green approach, and they need to increase the culture of sustainability, operating through the three fundamental pillars such as economic, environmental, and social.
- Managers and employees by training are more involved in CSR and green innovation initiatives by creating a culture that supports sustainability. If they understand the value and importance of these practices, they would be more likely to be engaged and contribute to the company's sustainability goals.

Over the years managers (based on the agency theory) have been the first employees to abuse the company resources, because they are focused on the short-term rewards.

- Researchers should test how much managers will increase the adoption of new eco-innovative technology after the companies include in their rewards and benefits package a "green bonus" or "green stock option", a definition suggested by the author, as a reward for the manager for adopting green technologies, but the bonus can be executed only in the long term not the short because being green is not only for today is for the future, and test if there will be an increase in environmental performance, while not harming the financial performance.

In future studies, there is a need for more studies in integrating CSR and Green Innovation into company strategy. The research of [5] demonstrates how green innovation and environmental strategy can significantly boost environmental performance.
In the study [95] conducted with 469 companies in Italy, France, and Germany, they interlinked the corporate green strategies with firm performance.

They play a major mediating role between environmental performance and CSR.

- Companies should implement strategies with green main goals and objectives. Implementing green innovation strategies has a positive effect on business performance, [96].

Only one of the articles [91] is identified to analyze R&D investment impact on financial performance, corporate social responsibility, and green innovation performance.

- Researchers should prioritize their focus on research and development (R&D). They should study how CSR, eco-innovation initiatives, and environmental performance impact financial performance.
- The government should increase funds, and grants to academics for research in CSR, eco-innovation, and their impact on companies' performance.
- Governments should set up research centers near universities for testing green products and new ideas for creating eco-friendly technologies. The best examples are the creation of the National Center for Technological Transfer and the diffusion of competencies related to green practices, technologies, and testing on new eco-products or green processes.

In the end, more studies should be done on stakeholders' pressure and their impact on CSR, green innovation, and performance.

In the research of [97] many CSR demands from stakeholders lead to a constant improvement in overall social CSR awareness of social and environmental issues.

6 Limitations & Suggestions of Future Research

The literature review in this study is not without limits. Despite the use of huge academic Scopus databases, due to the breadth of the root research string, it is conceivable that not all relevant papers were reviewed, including most recent studies that were published but not included in this study or other studies that are not included in the Scopus database. As a result, while this assessment is detailed, it cannot be considered exhaustive.

References:

[1] United Nations Conference on Trade and Development - *Investment Policy Framework for Sustainable Development*, 2015, [Online]. https://unctad.org/system/files/official-document/diaepcb2015d5_en.pdf (Accessed Date: December 22, 2024).

[2] Ali, H., Danish, R., & Asrar-ul-Haq, M. (2019). How corporate social responsibility boosts firm financial performance: The mediating role of corporate image and customer satisfaction. *Corporate Social Responsibility and Environmental Management*, Vol. 27, Issue 1, pp.166-177. https://doi.org/10.1002/csr.1781.

[3] Flammer, C., Hong, B., & Minor, D. (2019). Corporate governance and the rise of integrating corporate social responsibility criteria in executive compensation: Effectiveness and implications for firm outcomes. *Strategic Management Journal*, Vol. 40, Issue 7, pp.1097–1122. https://doi.org/10.1002/smj.3018.

[4] Collazzo, P., & Lozano, C. (2021). Corporate social responsibility, green innovation, and competitiveness: Causality in manufacturing. Competitiveness Review: *An International Business Journal*, ahead-of-print, Vol. 32, Issue 7, pp.21-39. https://doi.org/10.1108/CR-12-2020-0160.

[5] Sascha Kraus, Shafique Ur Rehman, F. Javier Sendra García, (2020), Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation, *Technological Forecasting and Social Change,* Vol. 160, 2020, 120262, ISSN: 0040-1625, https://doi.org/10.1016/j.techfore.2020.120262.

[6] United Nations, Transforming our world: the 2030, *Agenda for Sustainable Development*, [Online]. https://digitallibrary.un.org/record/3923923?v=pdf (Accessed Date: December 26, 2024).

[7] Moyer, J.D. and Hedden, S. (2020), "Are we on the right path to achieve the sustainable development goals?", *World Development*, Vol. 127, 104749, pp.104-111. https://doi.org/10.1016/j.worlddev.2019.104749.

[8] Amankwah-Amoah, J. (2020). Stepping up and stepping out of COVID-19: New challenges for environmental sustainability policies in the global airline industry. *Journal*

of Cleaner Production, Vol. 271, 123000, ISSN: 0959-6526, pp.1–12. https://doi.org/10.1016/j.jclepro.2020.123000.

[9] Long, W., Li, S., Wu, H., & Song, X. (2020). Corporate social responsibility and financial performance: The roles of government intervention and market competition. *Corporate Social Responsibility and Environmental Management,* Vol. 27, Issue 2, pp.525-541. https://doi.org/10.1002/csr.1817.

[10] Anser, M. K., Zhang, Z., & Kanwal, L. (2018). Moderating effect of innovation on corporate social responsibility and firm performance in the realm of sustainable development. *Corporate Social Responsibility and Environmental Management*, Vol. 25, Issue 5, pp.799–806. https://doi.org/10.1002/csr.1495.

[11] Ikram, M., Zhou, P., & Shah, S. A. A. (2019). Do environmental management systems help improve corporate sustainable development? Evidence from manufacturing companies in Pakistan. *Journal of Cleaner Production*, Vol. 226, pp.628–641. https://doi.org/10.1016/j.jclepro.2019.03.265.

[12] Maas S, Schuster T, Hartmann E, (2018), Stakeholder pressures, environmental practice adoption and economic performance in the German third-party logistics industry—a contingency perspective. *Journal of Business Economics,* Vol. 88, Issue 2, pp.167–201. https://doi.org/10.1007/s11573-017-0872-6.

[13] Schinzel, U. (2020). "I am a Responsible Leader" Responsible Corporate Social Responsibility: The Example of Luxembourg. *Business Perspectives and Research*, Vol. 8, Issue 1, pp.21-35. https://doi.org/10.1177/2278533719860019.

[14] Ma, C., Farid, M., Durrani, M., Bashir, R., Safdar, S., & Hussain, R. (2023). The corporate social responsibility and its impact on financial performance: A case of developing countries. *Sustainability*, Vol. 15, Issue 4, 3724, pp.18 https://doi.org/10.3390/su15043724.

[15] Wu L, Shao Z, Yang C, Ding T, Zhang W. The Impact of CSR and Financial Distress on Financial Performance—Evidence from Chinese Listed Companies of the Manufacturing Industry. *Sustainability*. 2020; Vol. 12, Issue 17, 6799, pp.19. https://doi.org/10.3390/su12176799.

[16] Scarpellini, S., Marín-Vinuesa, L.M., Aranda-Usón, A. and Portillo-Tarragona, P. (2020), "Dynamic capabilities and environmental accounting for the circular economy in businesses", *Sustainability Accounting, Management and Policy Journal*, Vol. 11, Issue 7, pp.1129-1158. https://doi.org/10.1108/SAMPJ-04-2019-0150.

[17] Ren, Shenggang & Huang, Min & Liu, Donghua & Yan, Karena. (2022). Understanding the Impact of Mandatory CSR Disclosure on Green Innovation: Evidence from Chinese Listed Firms. *British Journal of Management.* Vol. 34, Issue 2, pp. 874–897. https://doi.org/10.1111/1467-8551.12609.

[18] Xu X, Imran M, Ayaz M, Lohana S. The Mediating Role of Green Technology Innovation with Corporate Social Responsibility, Firm Financial, and Environmental Performance: The Case of Chinese Manufacturing Industries. *Sustainability*. 2022; Vol. 14, Issue 24, 16951, pp.20. https://doi.org/10.3390/su142416951.

[19] Feng, Y., Akram, R., Hieu, V. M., & Hoang Tien, N. (2022). The impact of corporate social responsibility on the sustainable financial performance of Italian firms: Mediating role of firm reputation. *Economic Research-Ekonomska Istraživanja,* Vol. 35, Issue 1, pp.4740–4758. DOI: 10.1080/1331677X.2021.2017318. Corpus ID: 245532699.

[20] Sarwar Huma, Aftab Junaid, Ishtiaq Ishaq Muhammad, Atif Muhammad, Achieving business competitiveness through corporate social responsibility and dynamic capabilities: An empirical evidence from emerging economy, *Journal of Cleaner Production*, Vol. 386, 2023, 135820, ISSN: 0959-6526, https://doi.org/10.1016/j.jclepro.2022.135820.

[21] Liu, Rong & Zhao, Min & Ren, Jianyu. (2022). The Influence Mechanism of Corporate Environmental Responsibility on Corporate Performance: The Mediation Effect of Green Innovation. *Sustainability*. Vol. 14, Issue 17, 10975, pp.27. doi: 10.3390/su141710975.

[22] Fosu, E., Fosu, F., & Akyina, N. (2024). Do environmental CSR practices promote corporate social performance? The mediating role of green innovation and corporate image. *Cleaner and Responsible Consumption*, Vol. 12, 100155. https://doi.org/10.1016/j.clrc.2023.100155.

[23] Ao, X., & Ong, T. (2021). The impact of environmental corporate social responsibility on enterprise performance: Implications for

sustainable development strategy. E3S *Web of Conferences,* Vol. 251, 02072, p.6. *2021 International Conference on Tourism, Economy and Environmental Sustainability* (TEES 2021), China, DOI: 10.1051/e3sconf/202125102072.

[24] Dai, X., Siddik, A. B., & Tian, H. (2022). Corporate social responsibility, green finance, and environmental performance: Does green innovation matter? *Sustainability*, Vol. 14, Issue 20, 13607, p.17. https://doi.org/10.3390/su142013607.

[25] Mo, Xiaoping & Boadu, Francis & Liu, Yunqing & Chen, Zhen & Ofori, Adwoa. (2022). Corporate Social Responsibility Activities and Green Innovation Performance in Organizations: Do Managerial Environmental Concerns and Green Absorptive Capacity Matter?. *Frontiers in Psychology,* Vol. 13, Article 938682, p.16. https://doi.org/10.3389/fpsyg.2022.938682.

[26] Aftab, J., & Veneziani, M. (2023). How does green human resource management contribute to saving the environment? Evidence of emerging market manufacturing firms. *Business Strategy and the Environment*, 1–17, Volume 33, Issue 2, pp.529–545. https://doi.org/10.1002/bse.3508.

[27] Edeh, J. N., Obodoechi, D. N., & Ramos-Hidalgo, E. (2020). Effects of innovation strategies on export performance: New empirical evidence from developing market firms. *Technological Forecasting and Social Change*, Vol. 158, 120167. https://doi.org/10.1016/j.techfore.2020.120167.

[28] Aftab, J., Abid, N., Sarwar, H., Amin, A., Abedini, M., & Veneziani, M. (2024). Does corporate social responsibility drive financial performance? Exploring the significance of green innovation, green dynamic capabilities, and perceived environmental volatility. *Corporate Social Responsibility and Environmental Management*, Vol. 31, Issue 3, pp.1634–1653. https://doi.org/10.1002/csr.2654.

[29] Dubey, R., Gunasekaran, A., & Ali, S. S. (2015). Exploring the relationship between leadership, operational practices, institutional pressures, and environmental performance: A framework for green supply chain. *International Journal of Production Economics*, 160, pp.120–132. DOI: 10.1016/J.IJPE.2014.10.001. Corpus ID: 153939492.

[30] Novitasari, Maya & Jiwa, Zeplin. (2022). The Role of Green Innovation in the Effect of Corporate Social Responsibility on Firm Performance. *Economies*. Vol. 10, Issue 15, 117, p.19. https://doi.org/10.3390/economies10050117.

[31] Castellacci, F., & Lie, C. (2016). A taxonomy of green innovators: Empirical evidence from South Korea. *Journal of Cleaner Production*, Vol. 143, pp.1036–1047. https://doi.org/10.1016/j.jclepro.2016.12.016.

[32] Kemp, R., (2008). Measuring Eco-Innovation *(MEI) Project*. UNU-MERIT Maastricht, [Online]. https://collections.unu.edu/eserv/UNU:869/rb01_08_measuring_eco_innovation.pdf (Accessed Date: December 26, 2024).

[33] European Commission. (2011). Communication from the Commission to the European Parliament, the Council, the *European Economic and Social Committee and the Committee of the Regions.* COM (2011) 899 final, [Online]. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0899:FIN:EN:PDF (Accessed Date: December 26, 2024).

[34] European Union. (2013). Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a general *Union environment action programme to 2020* 'Living well, within the limits of our planet', [Online]. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D1386 (Accessed Date: December 26, 2024).

[35] European Union. (2007). *Competitiveness and Innovation Framework Programme* (CIP) (2007-2013), [Online]. https://eur-lex.europa.eu/EN/legal-content/summary/competitiveness-and-innovation-framework-programme-cip-2007-2013.html (Accessed Date: December 26, 2024).

[36] Liao, Yu & Qiu, Xiaodong & Wu, Anni & Sun, Qian & Shen, Haomin & Li, Peiyang. (2022). Assessing the Impact of Green Innovation on Corporate Sustainable Development. *Frontiers in Energy Research*, Vol. 9, Article 800848, p.18. doi: 10.3389/fenrg.2021.800848.

[37] Handayani, R., Wahyudi, S., & Suharnomo, S. (2017). The effects of corporate social responsibility on manufacturing industry performance: The mediating role of social collaboration and green innovation. *Business:*

Theory and Practice, Vol. 18, pp.152–159. https://doi.org/10.3846/btp.2017.016.

[38] Hussain, Y., Abbass, K., Usman, M., Rehan, M., & Asif, M. (2022). Exploring the mediating role of environmental strategy, green innovations, and transformational leadership: The impact of corporate social responsibility on environmental performance. *Environmental Science and Pollution Research*, Vol. 29, pp.76864–76880. https://doi.org/10.1007/s11356-022-20922-7

[39] Muhammad Khalil, & Nimmanunta, K. (2021). Conventional versus green investments: Advancing innovation for better financial and environmental prospects. *Journal of Sustainable Finance & Investment*, 13, Issue 3, pp.1153-1180. DOI: 10.1080/20430795.2021.1952822.

[40] Simmou, Walid & Govindan, Kannan & Sameer, Ibrahim & Hussainey, Khaled & Simmou, Samira. (2022). Doing good to be green and live Clean! - Linking Corporate Social Responsibility strategy, Green Innovation, and Environmental Performance: Evidence from Maldivian and Moroccan Small and Medium-sized Enterprises. *Journal of Cleaner Production*, Vol. 384, Article 135265. doi: 10.1016/j.jclepro.2022.135265.

[41] Ong, T. S., A. S. Lee, B. H. Teh, and H. B. Magsi. 2019. "Environmental Innovation, Environmental Performance and Financial Performance: Evidence from Malaysian Environmental Proactive Firms." *Sustainability* Vol. 11 (3494), pp.1–18, doi: 10.3390/su11123494.

[42] Darnall, N., Ponting, C., & Vazquez-Brust, D. A. (2012). Why consumers buy green. In D. A. Vazquez-Brust & J. Sarkis (Eds.), *Green growth: Managing the transition to a sustainable economy*, First Chapter: 15, pp.287–308. Dordrecht: Springer. DOI: 10.13140/2.1.2610.2727.

[43] Zhang, D., Z. Rong, and Q. Ji. 2019. "Green Innovation and Firm Performance: Evidence from Listed Companies in China." Resources, *Conservation and Recycling*, Vol.144, pp. 48–55. https://doi.org/10.1016/j.resconrec.2019.01.023.

[44] Xie, Xuemei & Huo, Jiage & Zou, Hailiang. (2019). Green process innovation, green product innovation, and corporate financial performance: A content analysis method. *Journal of Business* Research, Vol. 101, pp. 697-706, https://doi.org/10.1016/j.jbusres.2019.01.010.

[45] Li W, Liu Z. Social, Environmental, and Governance Factors on Supply-Chain Performance with Mediating Technology Adoption. *Sustainability*. 2023; Vol. 15, Issue 14:10865, p.15. https://doi.org/10.3390/su151410865.

[46] OECD. The Measurement of Scientific and Technical Activities, 3rd ed.; *OECD Publishing*: Paris, France, 2005, [Online]. https://www.oecd.org/en/publications/the-measurement-of-scientific-and-technological-activities_19900414.html (Accessed Date: December 27, 2024).

[47] Murshudli, F, Green Banking for Sustainable Development (June 15, 2023). *Foresight and STI Governance*, Vol. 17, Issue 2, pp.82–94. DOI: 10.17323/2500-2597.2023.2.82.94.

[48] Produção, Gestão & Novitasari, Maya & Agustia, Dian. (2022). The role of green supply chain management and green innovation in the effect of corporate social responsibility on firm performance. *Gestão & Produção*, Vol. 29, Issue 117, p.17. 10.1590/1806-9649-2022v29e117.

[49] Ahmed, R., & Streimikiene, D. (2021). Environmental issues and strategic corporate social responsibility for organizational competitiveness. *Journal of Competitiveness*, Vol. 13, Issue 2, pp.5–22. https://doi.org/10.7441/joc.2021.02.01.

[50] Niazi, Umair & Nisar, Qasim & Nasir, Nadia & Naz, Shumaila & Haider, Shahbaz & Khan, Waqas. (2023). Green HRM, green innovation and environmental performance: the role of green transformational leadership and green corporate social responsibility. *Environmental Science and Pollution Research*, Vol. 30, Issue 15, pp.45353–45368. https://doi.org/10.1007/s11356-023-25442-6.

[51] Le, Thanh Tiep (2022), How do corporate social responsibility and green innovation transform corporate green strategy into sustainable firm performance? *Journal of Cleaner Production*, Vol. 362, 132228, ISSN: 0959-6526, https://doi.org/10.1016/j.jclepro.2022.132228.

[52] Bhat, A., Mir, A., Allie, A., Lone, D., Al-Adwan, A., Jamali, D., & Riyaz, I. (2023). Unlocking corporate social responsibility and environmental performance: Mediating role of green strategy, innovation, and leadership. *Innovation and Green Development*, Vol. 3,

Issue 2, Article 100112. https://doi.org/10.1016/j.igd.2023.100112.

[53] Nureen N, Liu D, Irfan M, Işik C. Nexus between corporate social responsibility and firm performance: a green innovation and environmental sustainability paradigm. *Environ Sci Pollut Res Int.* 2023 May; 30(21):59349-59365. DOI: 10.1007/s11356-023-26675-1. Epub 2023 Apr 1. PMID: 37004616.

[54] Sarfraz, Muddassar & Ozturk, Ilhan & Yoo, Sunghoon & Raza, Muhammad. (2023). Toward a new understanding of environmental and financial performance through corporate social responsibility, green innovation, and sustainable development. *Humanities and Social Sciences Communications*. Vol. 10, Article 297, p.17. DOI: 10.1057/s41599-023-01799-4.

[55] Kuzey, Cemil & Uyar, Ali & Ellili, Nejla & Karaman, Abdullah. (2023). Corporate social responsibility performance and social reputation via corporate social responsibility awarding: is there a threshold effect? *Corporate Governance.* Vol. 24, Issue 5, pp.993-1020. https://doi.org/10.1108/CG-03-2023-0128.

[56] Massaro, M., Dumay, J., & Guthrie, J. (2016). On the shoulders of giants: undertaking a structured literature review in accounting. Accounting, *Auditing, and Accountability Journal*, Vol. 29, Issue 5, pp.767–801. https://doi.org/ 10.1108/AAAJ-01-2015-1939.

[57] Secundo, G., Rippa, P., & Cerchione, R. (2020). Digital academic entrepreneurship: A structured literature review and avenue for a research agenda. *Technological Forecasting and Social Change*, 157, 120118. https://doi.org/10.1016/j.techfore.2020.120118.

[58] United Nations, 2015, Paris Agreement, [Online] https://unfccc.int/sites/default/files/english_paris_agreement.pdf (Accessed Date: December 28, 2024).

[59] Nationally determined contributions under the Paris Agreement (NDCs), *Conference of the Parties serving as the meeting of the Parties to the Paris Agreement Fifth session*, 14 November 2023, [Online]. https://unfccc.int/documents/632334, (Accessed Date: December 28, 2024).

[60] Shafique Ur Rehman, Sascha Kraus, Syed Asim Shah, Dmitry Khanin, Raj V. Mahto, Analyzing the relationship between green innovation and environmental performance in large manufacturing firms, *Technological Forecasting and Social Change*, Vol. 163, 2021, 120481, ISSN: 0040-1625, https://doi.org/10.1016/j.techfore.2020.120481.

[61] Hsu, C.-W., Hu, A., Chiou, C.-Y., & Chen, T.-C. (2011). Using the FDM and ANP to construct a sustainability balanced scorecard for the semiconductor industry. *Expert Systems with Applications*, Vol. 38, Issue 10, pp.12891–12899. https://doi.org/10.1016/j.eswa.2011.04.082.

[62] Jan van Eck. N and Waltman. L 31 October 2023. VOSviewer Manual: Manual for Manual for VOSviewer version 1.6.20, *Leiden: Universiteit Leiden Publications using VOSviewer,* [Online]. https://www.vosviewer.com/documentation/Manual_VOSviewer_1.6.20.pdf (Accessed Date: December 28, 2024).

[63] Zhang Y, Sun J, Yang Z, Li S. Organizational Learning and Green Innovation: Does Environmental Proactivity Matter? *Sustainability*. 2018, Vol. 10, Issue 10, 3737, p.14. https://doi.org/10.3390/su10103737.

[64] Wu, Aihua & Li, Tianfu. (2019). Gaining sustainable development by green supply chain innovation: Perspectives of specific investments and stakeholder engagement. *Business Strategy and the Environment*, Vol. 29, Issue 3, pp.962-975. https://doi.org/10.1002/bse.2410.

[65] Espaillat, H., Peñalver, A., & Conesa, J. A. (2022). Influencing responsible green innovation in Dominican agribusiness performance. *Corporate Social Responsibility and Environmental Management*, Vol. 29, Issue 3, pp.675-685. https://doi.org/10.1002/csr.2228.

[66] Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 on a General Union Environment Action Programme to 2030, *Official Journal of the European Union*, [Online]. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022D0591 (Accessed Date: December 28, 2024).

[67] Climate change communication and education country profiles: approaches to greening education around the world, *Global Education Monitoring Report Team*, https://doi.org/10.54676/XBVG6945, 2023, Source UNESCO, [Online]. https://www.unesco.org/en/articles/unesco-

cop28-making-education-long-term-solution-climate-crisis (Accessed Date: December 28, 2024).

[68] Uyar, Ali & Abdelqader, Muath & Kuzey, Cemil. (2022). Liquidity and CSR: a chicken and egg story. *Society and Business Review*. Vol. 18, Issue 1, 2022, pp.124-151(28). https://doi.org/10.1108/SBR-01-2022-0032.

[69] Aiello, F., Cardamone, P., Mannarino, L., & Pupo, V. (2021). Green patenting and corporate social responsibility: Does family involvement in business matter? *Corporate Social Responsibility and Environmental Management*, Vol. 28, Issue 4, pp.1386-1396. https://doi.org/10.1002/csr.2146.

[70] Ding, X., Ye, L., Yang, Y., Efimova, O., Steblyanskaya, A., & Zhang, J. (2022). The impact mechanism of environmental information disclosure on corporate sustainability performance: Micro-evidence from China. *Sustainability*, Vol. 14, Issue 19, 12366, p.22. https://doi.org/10.3390/su141912366.

[71] Rauf, Fawad & Baolei, Qi & Naveed, Khwaja & Na, Cao & Wanqiu, Wang. (2023). R&D investment, Corporate Social Responsibility Disclosure and Firms Green Innovation Performance: Evidence from China. *International Journal of Trade and Global Markets*, Vol. 18, Issue 1, pp.82-109, https://doi.org/10.1504/IJTGM.2023.134918.

[72] Rauf, Fawad & Wang, Wanqiu & Voinea, Cosmina. (2024). Interaction of Corporate Social Responsibility Reporting at the Crossroads of Green Innovation Performance and Firm Performance: The Moderating Role of the Enterprise Life Stage. *Sustainability*. Vol. 16, Issue 5, 1821, p.18. https://doi.org/10.3390/su16051821.

[73] Weston, P., & Nnadi, M. (2021). Evaluation of strategic and financial variables of corporate sustainability and ESG policies on corporate finance performance. *Journal of Sustainable Finance & Investment*, Vol. 13, Issue 2, pp.1058–1074. https://doi.org/10.1080/20430795.2021.1883984.

[74] Li, Liang & Wang, Yanghong & Sun, Huaping & Shen, Huihui & Lin, Yuen. (2023). Corporate Social Responsibility Information Disclosure and Financial Performance: Is Green Technology Innovation a Missing Link? *Sustainability*, Vol. 15, Issue 15, Article number 11926, p.18. https://doi.org/10.3390/su151511926.

[75] Yang, Ya-ru & Wang, Jianqiong & Lou, Wentao. (2023). Effect of equity checks and balances on corporate social responsibility: A moderated mediating effect. *Cross Cultural & Strategic Management.* Vol. 30 Issue. 3, pp.527-553. https://doi.org/10.1108/CCSM-12-2022-0214.

[76] China's Innovation Index in 2023, *National Bureau of Statistics of China*, 2024-10-26, [Online]. https://www.stats.gov.cn/english/PressRelease/202411/t20241107_1957293.html#:~:text=According%20to%20the%20calculation%20of%20the%20research%20group,an%20increase%20of%206.0%20percent%20over%20the%20pre (Accessed Date: December 28, 2024).

[77] Asian Development Bank. (2021). *The 14th Five-Year Plan of the People's Republic of China — Fostering high-quality development*, [Online]. https://www.adb.org/sites/default/files/publication/705886/14th-five-year-plan-high-quality-development-prc.pdf (Accessed Date: December 28, 2024).

[78] Martínez-Falcó, Javier & Marco-Lajara, Bartolome & Sánchez García, Eduardo & Millán-Tudela, Luis & Popescu, Cristina Raluca Gh. (2024). Bridging Corporate Social Responsibility and Green Innovation: A Structural Equation Study of Spain's Wine Industry, in book: *Intersecting Environmental Social Governance and AI for Business Sustainability*, Chapter: 3, p.28, Publisher: IGI GLOBAL, DOI: 10.4018/979-8-3693-1151-6.ch003.

[79] Le, Thanh & Vo, Xuan & Venkatesh, V.G. (2022). Role of green innovation and supply chain management in driving sustainable corporate performance. *Journal of Cleaner Production.* Vol. 374. 133875. https://doi.org/10.1016/j.jclepro.2022.133875.

[80] Ruan R, Chen W, Zhu Z. Linking Environmental Corporate Social Responsibility with Green Innovation Performance: The Mediating Role of Shared Vision Capability and the Moderating Role of Resource Slack. *Sustainability.* 2022; Vol. 14, Issue 24, Article number 16943, p.20. https://doi.org/10.3390/su142416943.

[81] Li, Cai & Aziz, Fazeelat & Asim, Shoaib & Shahzad, Muhammad & Khan, Asad Ullah. (2023). Employee green behavior: a study on the impact of corporate social responsibility (CSR) on employee green behavior, green culture: the moderating role of green

innovation. *Environmental Science and Pollution Research.* Vol. 30, pp.105489–105503. doi: 10.1007/s11356-023-29798-7.

[82] Hou, Y., Bello-Pintado, A., & García-Marco, T. (2023). Pay to be green? The effect of corporate social responsibility contracting on green innovation performance. *BRQ Business Research Quarterly,* 0(0), p.17. https://doi.org/10.1177/23409444231189825.

[83] Meng, X., & Imran, M. (2024). The impact of corporate social responsibility on organizational performance with the mediating role of employee engagement and green innovation: evidence from the Malaysian banking sector. *Economic Research-Ekonomska Istraživanja,* Vol. 37, Issue 1, p.27. https://doi.org/10.1080/1331677X.2023.2264945.

[84] Gul, R., Jamil, K., Mustafa, S., Jaffri, N., Anwar, A., & Awan, F. (2024). Studying the green performance under the lens of total quality management in Chinese SMEs. *Environment, Development and Sustainability.* Vol. 26, pp.22975–22996, (2024), https://doi.org/10.1007/s10668-023-03586-2.

[85] Khan, A., Li, C., Shahzad, M, Kwasi Sampene, A. Green effectual orientations to shape environmental performance through green innovation and environmental management initiatives under the influence of CSR commitment. *Environmental Science and Pollution Research*, Vol. 30, pp.2205–2217, (2023). https://doi.org/10.1007/s11356-022-22263-x.

[86] Zhao, Xiaomin & Li, Jiahui & Li, Yang. (2023). Impact of Environmental Tax on Corporate Sustainable Performance: Insights from High-Tech Firms in China. *International Journal of Environmental Research and Public Health.* Vol. 20, Issue 1, pp.461. https://doi.org/10.3390/ijerph20010461.

[87] Aftab, J., Veneziani, M., Sarwar, H., & Abid, N. (2024). Do green practices drive business excellence in SMEs? Investigating how green entrepreneurial orientation improves firm performance. *Total Quality Management & Business Excellence*, Vol. 35, Issue 5-6, pp. 529–558. https://doi.org/10.1080/14783363.2024.2315442.

[88] Zhou, Guangyou & Sun, Yongkun & Luo, Sumei & Liao, Jiayi. (2021). Corporate social responsibility and bank financial performance in China: The moderating role of green credit. *Energy Economics.* Vol. 97, Issue 4. 105190. https://doi.org/10.1016/j.eneco.2021.105190.

[89] Wang, Yi & Feng, Junke & Yasir, Nosheena & Bai, Yu. (2022). The Impact of Political Incentives Received by Key Local Officials on Enterprises' Green Innovations for the Development and Construction of Ecological Civilization in China. *Sustainability*. Vol. 14, Issue 18. 11347, p.24. https://doi.org/10.3390/su141811347.

[90] Chen, X., Ou, J., Tang, X., & Yang, Q. (2023). The impact of officials' off-office accountability audit of natural resource assets on firms' green innovation strategies: A quasi-natural experiment in China. *Sustainability*, Vol. 15, Issue 3, 2640, p.36. https://doi.org/10.3390/su15032640.

[91] Ding, X., Zhang, Y., Fu, Y., & Xu, Z. (2024). R&D investment and corporate total factor productivity under heterogeneous environmental regulations: Evidence from Chinese micro firms. *International Journal of Environmental Science and Technology*. Vol. 22, Issue 1, pp.753–772. https://doi.org/10.1007/s13762-024-05710-9.

[92] Sun, Ziyuan & Sun, Xiao & Wang, Lihong & Wang, Wei. (2023). Substantive transformation or strategic response? The impact of a negative social responsibility performance gap on green merger and acquisition of heavily polluting firms. *Journal of Environmental Planning and Management.* pp.1-25. https://doi.org/10.1080/09640568.2023.2285727.

[93] Rana, Geeta & arya, vikas. (2023). Green human resource management and environmental performance: mediating role of green innovation – a study from an emerging country. *Foresight*. Vol. 26, Issue 1, pp.35-58. https://doi.org/10.1108/FS-04-2021-0094.

[94] Xie, Xuemei & Zhu, Qiwei. (2020). Exploring an innovative pivot: How green training can spur corporate sustainability performance. *Business Strategy and the Environment*, Vol. 29, Issue 6, pp.2432-2449, https://doi.org/10.1002/bse.2512.

[95] Le, Thanh Tiep & Ferasso, Marcos. (2022). How green investment drives sustainable business performance for food manufacturing SMEs? Evidence from an emerging economy. *Corporate Social Responsibility and Environmental Management*. Vol. 29, Issue 4, pp.872–885. https://doi.org/10.1002/csr.2252.

[96] Luangpaiboon, Phatchanok & Charoenwiriyakul, Chandej & Koolrojanaput, Siravit. (2020). Hybrid Computing and Decision Technologies in Improving Accuracy of Structural Equation Model for Sustainable Environmentally Friendly Product Management. *International Journal of Environmental Science and Development.* Vol. 11, Issue 9, pp.432-437. https://doi.org/10.18178/ijesd.2020.11.9.1286

[97] Peng, Xue-rong & Wei, Jiang & Zhang, Yang. (2012). CSR demands of stakeholders and corporate green innovation supply: A case study of Narada. *International Symposium on Management of Technology (ISMOT), Hangzhou, China,* 2012, pp.211-215, DOI: 10.1109/ISMOT.2012.6679461.

Abbreviations

The following abbreviations are used in this manuscript:

CSR – Corporate Social Responsibility
EP – Environmental Performance
FP – Financial Performance
FIP – Firm Performance
GI – Green Innovation
GIA – Green Innovation Actions
GIS – Green Innovation Strategies
GHRM – Green Human Resources Management
GIP – Green Innovation Performance
GPI – Green Process Innovation
GPRI – Green Product Innovation
GTI – Green Technology Innovation.
OP – Organizational performance.
SCP – Sustainable corporate performance

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The author contributed in the present research, at all stages from the formulation of the problem to the final findings and solution.

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Conflict of Interest

The author has no conflict of interest to declare.

APPENDIX

Table 5. The top 5 most cited authors

Authors	Title	Year	Source Title	Cited by
[5]	Corporate social responsibility and environmental performance: The mediating role of environmental strategy and green innovation, [5]	2020	Technological Forecasting and Social Change	519
[60]	Analyzing the relationship between green innovation and environmental performance in large manufacturing firms, [60]	2021	Technological Forecasting and Social Change	340
[3]	Corporate governance and the rise of integrating corporate social responsibility criteria in executive compensation: Effectiveness and implications for firm outcomes, [3]	2019	Strategic Management Journal	229
[16]	Dynamic capabilities and environmental accounting for the circular economy in businesses, [16]	2020	Sustainability Accounting, Management and Policy Journal	139
[61]	Using the FDM and ANP to construct a sustainability-balanced scorecard for the semiconductor industry, [61]	2011	Expert Systems with Applications	123

Source: Author

Table 5. The interconnected between Corporate Social Responsibility, Green/ Eco-innovation, and Performance and their position in different research models

Variables	In a position of	Authors	Key Findings / Conclusion
Corporate Social Responsibility (CSR)	*Independent Variable*	[5], [78], [28], [79], [40], [30], [18], [25], [54], [80], [81], [47], [82], [83], [49]	1. As per [5], there is no direct impact of CSR on environmental performance, but green innovation and environmental strategy mediate the role of environmental performance and CSR. 2. CSR significantly improves EP and GI and partially mediates their interconnection, [40]. 3. In general, as other authors mention in the row CSR is positively correlated to performance and Green Innovation mediates their link.
	Dependent Variable	[22], [75]	CSR is promoted through green innovation, [22], and Environmental uncertainty moderates the relationship between Green Innovation Performance and CSR, [75]
	Mediators	[84]	Here we find the CSR mediator variable between Total quality management and Corporate green performance.
	Moderators	[85]	CSR moderates the relationship between green effectuation orientations and Environmental performance.
Performance	*Independent Variable*	N/A	
	Dependent Variable	[18], [54], [85], [81], [5], [40]- as **EP**, [84], [25], [78], [80], [82]– as **GIP,** [47], [86], [44], [18], [28], [54]– as **FP** [28], [30]- as **FIP** [79] -as, **SCP** [83], [49]– as **OP**	Performance is seen in six terms Environmental, Green Innovation, Financial, Firm, Sustainable, and Organizational Performance. 1. Generally, when CSR is an independent variable there is a positive correlation between CSR and Performance, mediated by green innovation. Still, as is mentioned in the CSR summary and the Green Innovation summary both in

			Table 5. The interconnected between Corporate Social Responsibility, Green/ Eco-innovation, and Performance and their position in different research models there are some exceptional cases where the correlation is not positive. 2. In some cases, CSR is found as an independent variable, but is found in Green entrepreneurial orientation, [87], Green effectuation orientations, [85], Environmental tax, [86], and Total quality management, [84] but in all the cases these concepts are strongly related to environmental issues.
	Mediators	[75], [85]- as **GIP**	Green innovation performance as the mediator has a positive impact on CSR, [75], [85], green innovation performance mediates the relationship to environmental performance.
	Moderators	N/A	
Green/ Eco Innovation	*Independent Variable*	[44], as **GPI**	Green process innovation has a direct positive effect on green product innovation and a firm's financial performance.
	Dependent Variable	N/A	
	Mediators	[54], [30], [40], [79], [5], [87], [49], [83], [47], [86], [44]- as, GPRI [18] - as **GTI**	As a concept green innovation is seen mainly as a mediator, but a similar concept is seen also as a mediator such as green innovation influence, [22], Environmental management initiatives, [85], Green practices (resource use and emissions practices), [82], Employees' green behavior / green culture, [81] Conclusion: 1. Green innovation did not mediate the effect of CSR on firm performance, [47], and in the research, [83] green innovation does not mediate the relationship between CSR and Organizational performance.
	Moderators	[81], [54], as **GIS**/ **GIA**	Green innovation moderates the effect of CSR in relation to other variables, [81]. Green innovation strategies and green innovation actions moderate the link between the environmental and financial aspects of a company, [54].

Source: Elaborated by the author