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Climate Finance and Sustainability: A Story Told Through the Journal of Cleaner Production

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Abstract: This study examines all research related to climate finance and sustainability published in the Journal of Cleaner Production between 2010 and 2024. It employs a bibliometric analysis in conjunction with a systematic literature review of 41 peer-reviewed articles to identify changes in research patterns, institutional development, and emerging thematic trends. Since 2015, research has shifted from primarily conceptual discussions to more empirical investigations, largely influenced by two major global developments: the Paris Agreement and the evolving Environmental, Social, and Governance (ESG) standards. The analysis focuses on three primary areas: the integration of green bonds, renewable energy finance, and blockchain technologies. While the journal exhibits strong publication activity from East Asian and European academic institutions, it remains underrepresented in contributions from the Global South, particularly in African contexts and the field of agricultural finance. The findings suggest that the journal serves as a critical conduit linking academic research with practical financial instruments that support sustainability. Future research should adopt multi-disciplinary approaches, aligning financial innovations with sector-specific applications, and prioritize vulnerable economies to advance global climate objectives. The study underscores the interconnected role of finance, policy, and technology as essential levers in achieving sustainable development goals.

Keywords: Climate Finance, Sustainability, Journal of Cleaner Production, ESG, Literature Review, Bibliometric Analysis.

Type: Research paper

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1. Introduction

The urgency of addressing climate change has elevated climate finance to a central topic in sustainability discourse over the past few decades. Academic scholarship focusing on the intersection of financial systems and sustainable development has found a primary outlet in the Journal of Cleaner Production, which serves as a key publication platform in this field. Over time, academic thinking on climate finance mechanisms has evolved in response to policy shifts and market developments, reflecting a growing understanding of the practical applications of climate finance.

Between 2010 and 2015, the Journal of Cleaner Production predominantly published conceptual research that defined green financing practices and environmental accounting frameworks. These studies also explored the integration of financial systems into environmental policy development. During this period, organizations largely viewed sustainability as an operational and managerial challenge, with finance playing a supportive role in achieving environmental objectives.

A significant shift occurred after 2015, coinciding with the adoption of the Paris Agreement and the global mainstreaming of Environmental, Social, and Governance (ESG) standards. The journal's literature began to emphasize how financial innovations—such as green bonds and sustainable banking systems—can contribute to low-carbon economic transitions (Wang & Zhang, 2023). The research broadened geographically, encompassing both developed and emerging economies, and began to incorporate themes such as institutional behavior, policy instruments, investor psychology, and enabling technologies that support green financial solutions.

From 2021 to 2024, the Journal of Cleaner Production has continued to integrate a wide range of research domains. Recent publications link climate finance with circular economy models, sustainable supply chain strategies, and climate resilience planning. This growth indicates that the field is maturing—not only exploring sustainability issues but also offering actionable sustainable financial solutions.

Viewed longitudinally, the Journal of Cleaner Production does more than chronicle academic progress; it also maps the global evolution of climate capital alignment. This paper examines the major thematic shifts and research transitions within the journal's climate finance literature, highlighting how academic scholars both respond to and shape policy developments, market dynamics, and technological advances in sustainability.

2. Methodology

The methodology employed a systematic approach using a Scopus database search to conduct a focused literature review on climate finance and sustainability. The review concentrated on scholarly works published in the Journal of Cleaner Production between 2010 and 2024, as it is recognized as one of the leading journals in the field of environmental sustainability.

Three central themes—climate, finance, and sustainability—guided the article selection process. Only articles that explicitly addressed all three themes were included, ensuring thematic consistency and reinforcing the study's conceptual foundation.

The analysis was further refined by limiting subject domains to those categorized under Business, Management, and Accounting. This disciplinary focus ensured contextual relevance by aligning the review with environments related to organizational operations, financial institutions, and policy development.

To maintain depth and coherence, only articles published in the Journal of Cleaner Production were included. Focusing on a single, high-impact journal allowed for a thorough examination of how a leading publication addresses climate finance and sustainability across its body of work.

The review was restricted to publications written in English to ensure linguistic consistency and facilitate the comparability of academic terminology, methodological frameworks, and analytical approaches.

In addition, only full-length peer-reviewed research articles were included. Editorials, reviews, conference proceedings, letters, and other non-research items were excluded to uphold the methodological rigor of the review.

A targeted keyword search was conducted using the following terms: Sustainable Development, Green Finance, Climate Change Mitigation, Environmental Protection, Climate Finance, Environmental Sustainability, Green Innovations, Green Technology, and ESG (Environmental, Social, and Governance) Performance. These keywords helped refine the dataset to align with the study's specific areas of interest.

After applying all inclusion criteria, a total of 41 articles were identified. These articles form the analytical foundation of the literature review and reflect the evolving academic discourse on climate finance and sustainability, as captured through the lens of the Journal of Cleaner Production.

3. Bibliometric Analysis

3.1. Temporal Analysis of Publications

The bibliometric analysis of the 41 selected articles from the Journal of Cleaner Production reveals a clear upward trend in research interest at the intersection of climate finance and sustainability. Following the Paris Agreement of 2015, global environmental policies began to shift toward more responsible and sustainable financial approaches. Scholarly activity in this field gained substantial momentum after 2020, with a notable spike of 12 research papers published in 2023, followed by 8 in 2022 and 6 in 2024. This pattern reflects the journal's responsiveness to evolving global sustainability priorities during the post-COVID recovery period and the strengthening of Environmental, Social, and Governance (ESG) standards. The surge in academic output aligns with key developments such as the Glasgow Climate Pact and the increased mobilization of green investments, themes that are increasingly reflected in the scholarly discourse (see Figure 1).

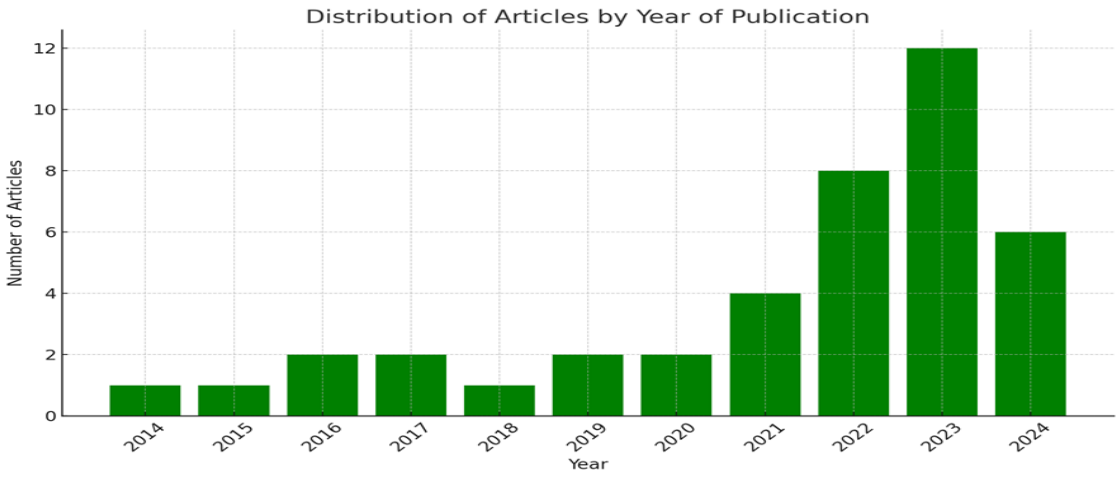

Figure 1: Distribution of articles by year of publication

3.2. Analysis of Institutional Contributions

The bibliometric findings indicate that research on climate finance and sustainability published in the Journal of Cleaner Production is supported by a wide and diverse network of contributors, including academic institutions and international policy-oriented organizations. Notable contributions come from the School of Management and Economics at Beijing Institute of Technology and the World Bank's Disaster Risk Management Hub in Tokyo. Other prominent institutions include the Graduate School of Economics and Management at Ural Federal University, the Polytechnic of Coimbra (Portugal), the Department of Urban and Environmental Engineering at Kyushu University (Japan), and several universities across China and France, such as Xi'an Jiaotong University, Nanjing University of Information Science and Technology, Qingdao University, Anhui Polytechnic University, and the CNRS - i3-CRG Interdisciplinary Innovation Research Center.

This institutional diversity highlights the interdisciplinary nature of climate finance and sustainability research and demonstrates how academic agendas are aligning with global sustainability goals. The convergence of academic and policy-oriented contributions enhances the capacity of scientific research to guide investment flows and inform impactful strategies for a more sustainable future (see Figure 2).

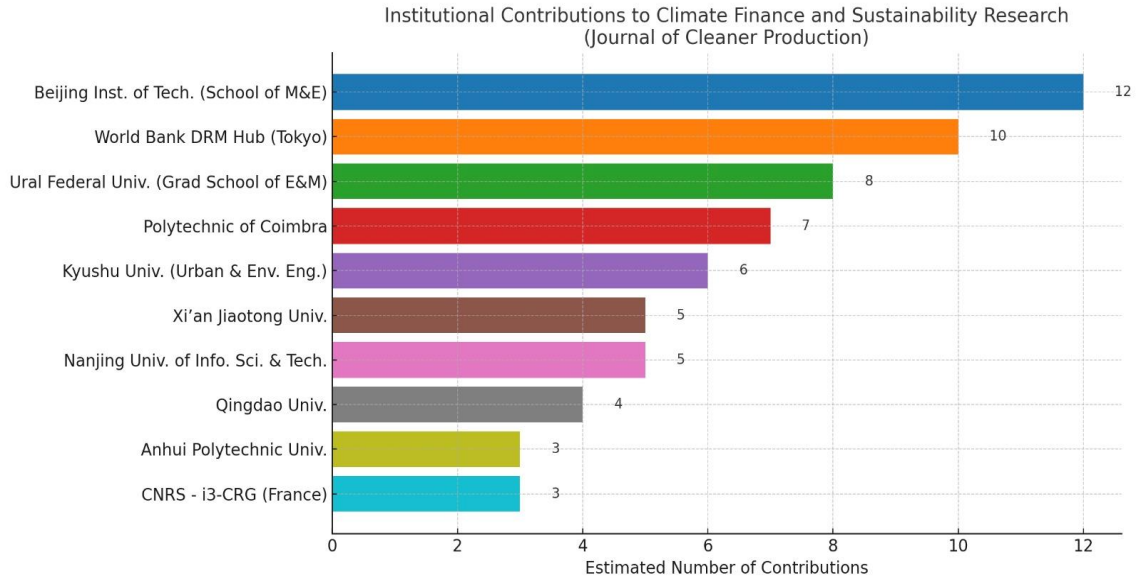

Figure 2: Distribution of articles by institutional contributions

3.3. The Most Influential Contributions

The most cited article in this domain is "The Green Advantage: Exploring the Convenience of Issuing Green Bonds" by Gianfrate and Peri, which has received 357 citations. This paper plays a foundational role in shaping the literature on green bonds (Gianfrate & Peri, 2019). Other highly influential works include those by Tolliver et al. (2020) and Damert et al. (2017), which address market growth drivers and corporate carbon strategies, respectively (see Table 1).

Table 1: Most cited articles in climate finance and sustainability research

Title	Authors	Citations
The green advantage: Exploring the convenience of issuing green bonds	Gianfrate G.; Peri M.	357
Drivers of green bond market growth: The importance of Nationally Determined Contributions to the Paris Agreement and implications for sustainability	Tolliver C.; Keeley A.R.; Managi S.	209
Exploring the determinants and long-term performance outcomes of corporate carbon strategies	Damert M.; Paul A.; Baumgartner R.J.	119

3.4. Thematic Evolution and Emerging Research Clusters

A thematic analysis of author keywords highlights the evolving academic dimensions of climate finance research published in the journal. Four main keywords appear frequently: Green finance, Climate change, Climate finance, and Renewable energy. The discourse has transitioned from defining conceptual foundations to applying sustainable finance within specific sectors and strategies.

Recent studies increasingly explore how sustainable finance integrates with energy transitions and corporate strategies. The concurrent use of terms like Green bonds, Financial performance, and Environmental sustainability indicates

an emerging alignment between financial tools and environmental outcomes, particularly for business and policy-making purposes.

While qualitative assessments traditionally dominated this field, scholars are now developing quantitative measurement methods to evaluate the effectiveness of financial instruments in driving sustainability outcomes. Interdisciplinary approaches—drawing from economics, management, and environmental engineering—are also becoming more common, reflecting the journal's role in bridging academic insight and practical application (see Figure 3).

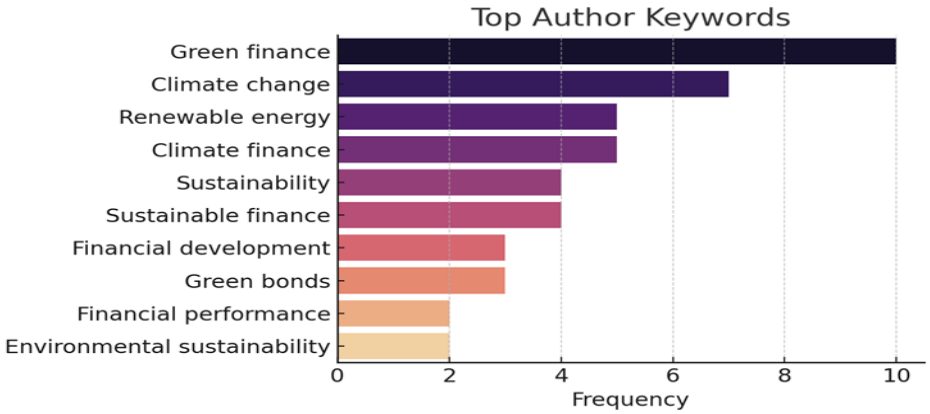

Figure 3: Distribution of articles by top author keywords

3.5. Collaborative Networks and Author Contributions

The co-authorship patterns of the selected articles reveal a high level of interdisciplinary and cross-institutional collaboration. Researchers frequently co-publish with colleagues from a range of academic and policy institutions. Noteworthy contributors such as Gianfrate and Managi appear in multiple high-impact studies, often within international research consortia. These patterns exemplify the trend toward networked science, where collective expertise is mobilized to address complex environmental and financial challenges (see Figure 4).

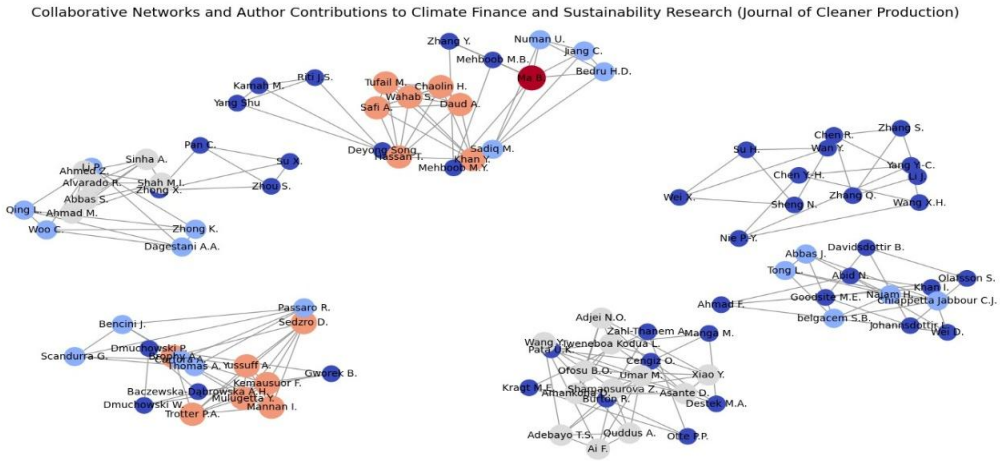

Figure 4: Distribution of articles by collaborative networks and author contributions

3.6. Geographic Distribution and Institutional Representation

Institutional affiliations indicate a strong geographic clustering in East Asia and Europe. Institutions such as Beijing Institute of Technology and Kyushu University feature prominently among the most productive contributors. This reflects broader trends in sustainability funding and academic output, where innovation-oriented economies are making significant investments in green finance scholarship.

However, representation from the Global South, while present, remains limited. This suggests a need for capacity building and the establishment of research partnerships to support climate finance research in regions that are particularly vulnerable to climate change but underrepresented in academic literature (see Figure 5).

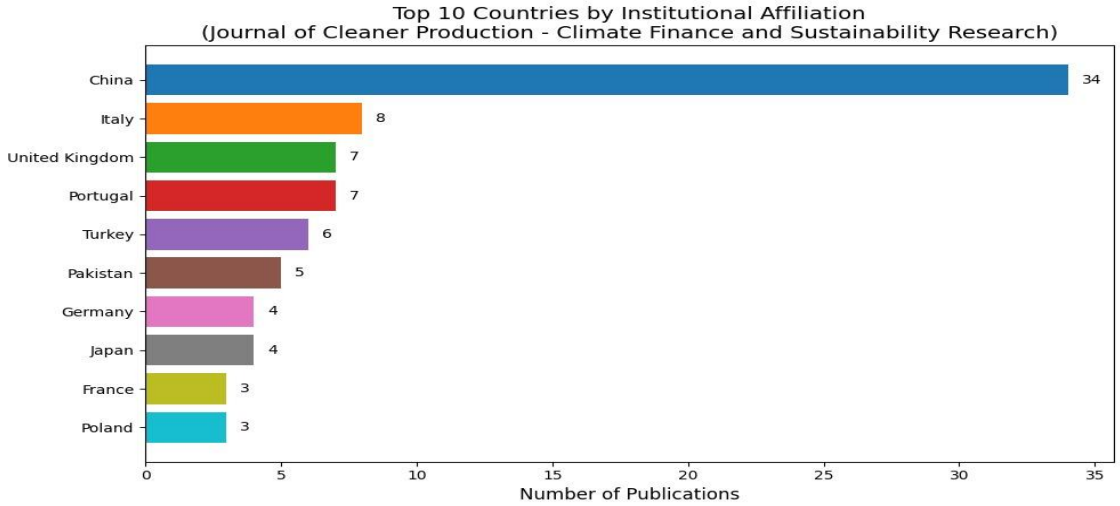

Figure 5: Distribution of articles by geographic and institutional representation

3.7. Sectoral Representation

The analysis reveals broad sectoral engagement, though certain industries—most notably energy—receive greater attention. The renewable energy sector is

frequently examined, with scholars exploring the role of green finance in accelerating the transition to low-carbon energy systems. For example, studies such as Nie et al. (2016) analyze subsidies in carbon finance as mechanisms to promote clean energy adoption.

The manufacturing sector is also featured, particularly in discussions about corporate environmental performance and green bond issuance. Emerging sectors include agriculture and urban infrastructure, though the former remains underrepresented despite its importance for climate mitigation and adaptation. This indicates a gap in the literature and a need to develop sector-specific financial instruments tailored to the risks and timeframes associated with each industry (see Figure 6).

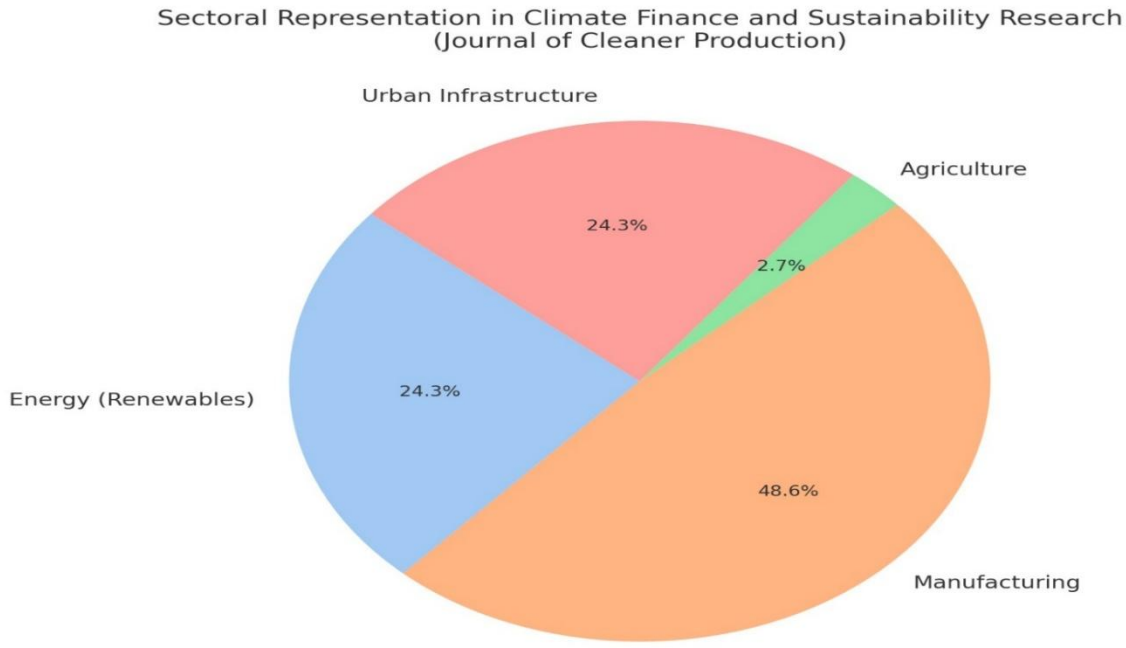

Figure 6: Distribution of articles by sectoral representation

4. The Evolution of Climate Finance and Sustainability in the Journal of Cleaner Production

Scholarly work on climate finance and sustainability has advanced substantially in recent years, driven by the growing recognition of green finance as a key tool for reducing environmental degradation while supporting economic growth and resource preservation. For example, Numan et al. (2023), in a study of thirteen complex economies, demonstrated the environmental quality benefits of green finance when combined with appropriate policies for sustainable infrastructure. A quantitative study by Mehboob et al. (2024) identified environmental innovation, green taxes, and geopolitical changes as critical components for the effectiveness of green finance in reducing environmental damage in China.

Qing et al. (2024) combined corporate data with an analysis of executive leadership traits, concluding that the environmental experience of CEOs significantly influences both financial and energy performance under climate change pressures. In a regional context, Kaewsaeng-on and Mehmood (2024) used quantile models to assess environmental risk in South Asian countries, finding considerable variation in the effectiveness of green regulatory policies depending on risk levels and economic development stages.

From an interactive systems perspective, Xie (2024) explored the joint effects of green finance, ESG performance, and carbon neutrality goals, revealing that their combined impact is more significant than their individual contributions. In the chemical and pharmaceutical sectors, Calciolari et al. (2024) employed a bibliometric analysis supported by artificial intelligence to assess financial disclosures, uncovering discrepancies in transparency and sustainability commitment among firms.

Wan et al. (2023) highlighted the spatial spillover effects of green finance in China, showing its influence extends beyond local boundaries to drive regional energy transitions. Using urban-level data, Teng and Shen (2023) demonstrated that digital financial services improve carbon efficiency, suggesting that fintech tools can be instrumental in achieving environmental objectives. Similarly, Zhang et al. (2023) showed that carbon emission trading schemes help reduce firms' default risk by lowering their exposure to environmental liabilities.

In the realm of technology, Alzoubi and Mishra (2023) introduced the concept of "green blockchain," emphasizing its potential to enhance transparency and efficiency in sustainable financial transactions. Leitão et al. (2023) found that Iberian companies with robust ESG frameworks attract more green investment. Wei et al. (2023) further revealed that digital financial inclusion facilitates the growth of renewable energy in China, reinforcing the role of innovation in supporting sustainability.

Wang et al. (2023) assessed Finland's approach to energy efficiency and renewable energy management, advocating for its adoption by other developed nations. Pohl et al. (2023) demonstrated that sustainability-linked loans are influenced by both borrower- and lender-specific factors, and are increasingly tied to ESG metrics in financial decision-making. Gomes and Pinho (2023) revealed varying levels of commitment among European SMEs toward SDG 12, suggesting the need for targeted policy support.

Pata et al. (2023) examined the environmental implications of NATO militarization, finding that technological innovation and financial development mitigate its negative impacts. Tong et al. (2022) found that environmental regulation and green technology finance positively affect green productivity in Asia. Ahmed et al. (2022) showed that climate finance is effective only in politically and economically stable environments.

Su et al. (2022) highlighted the mediating role of environmental disclosure in enhancing the impact of green credit on green technological innovation. Rickman et al. (2022) offered a comprehensive view of the factors influencing investment in wind energy. Kodua et al. (2022) identified weak institutional and

cultural infrastructures as barriers to green human resource practices in developing countries, focusing on Ghana.

Amighini et al. (2022) examined the Green Climate Fund's portfolio and called for a sharper focus on high-impact sectors. Similarly, Trotter et al. (2022) advocated for the mainstreaming of co-benefits in climate policies in low- and middle-income countries, highlighting the importance of governance. Austin and Rahman (2022) proposed integrated policies combining finance and innovation to facilitate circular economy initiatives in European SMEs.

Zhang (2021) found that firms with strong environmental performance enjoy greater access to credit. Matiiuk and Liobikienė (2021) showed that financial, social, and media tools influence individual behavior towards conservation in Lithuania. Kragt et al. (2021) found increasing interest in crowdfunding for climate mitigation in agriculture, illustrating the diversity of sustainable finance instruments.

In the Polish context, Dmuchowski et al. (2021) highlighted the importance of local government leadership in managing green growth. Tolliver et al. (2020) showed that the Paris Agreement's Nationally Determined Contributions (NDCs) stimulated the growth of the green bond market. Scandurra et al. (2020) found that targeted adaptation financing reduces climate vulnerability in Small Island Developing States.

Gianfrate and Peri (2019) explored how green bonds lower borrowing costs and enhance corporate reputation. Ragosa and Warren (2019) emphasized the importance of political stability and strong regulation in attracting private capital to renewable energy. Dilling and Harris (2018), along with Damert et al. (2017), highlighted the links between long-term value reporting, planned carbon strategies, and financial performance.

Riti et al. (2017) evaluated the global interplay between energy use, financial development, and climate change mitigation, emphasizing the need for integrated financial-environmental policies. Kanda et al. (2016) concluded that scaling environmental technologies requires sector-specific institutional support, while Nie et al. (2016) demonstrated that subsidies promote renewable energy adoption. Jones (2015) addressed investment barriers in clean energy infrastructure, and Johannsdottir et al. (2014) identified insurance firms in the Nordics as important players in supporting environmental innovation through risk-sharing mechanisms.

These studies are summarized in Table 2 below.

Table 2: Articles on climate finance and sustainability in the journal of cleaner production (2010-2024) as indexed in scopus

Article title	Authors	Year of publication
Support for sustainable finance and investment in Europe	Olumekor M.; Oke A.	2024
Does green finance reduce environmental degradation? The role of green innovation, environmental tax, and geopolitical risk in China	Mehboob M.Y.; Ma B.; Mehboob M.B.; Zhang Y.	2024

Does climate change exposure impact on corporate finance and energy performance? Unraveling the moderating role of CEOs' green experience	Qing L.; Li P.; Dagestani A.A.; Woo C.; Zhong K.	2024
Quantile modeling for environmental risk: SAARC's journey with green finance, policies, and regulations	Kaewsaeng-on R.; Mehmood S.	2024
The interactive impact of green finance, ESG performance, and carbon neutrality	Xie Y.	2024
Sustainability disclosure in the pharmaceutical and chemical industries: Results from bibliometric analysis and AI-based comparison of financial reports	Calciolari S.; Cesarini M.; Ruberti M.	2024
Study on the spatial spillover effect and path mechanism of green finance development on China's energy structure transformation	Wan Y.; Sheng N.; Wei X.; Su H.	2023
The role of green finance in mitigating environmental degradation: Empirical evidence and policy implications from complex economies	Numan U.; Ma B.; Sadiq M.; Bedru H.D.; Jiang C.	2023
The impact of fintech on carbon efficiency: Evidence from Chinese cities	Teng M.; Shen M.	2023
Does carbon emission trading mitigate firm's default risk? Evidence from China	Zhang Q.; Zhang S.; Chen R.; Li J.	2023
Green blockchain – A move towards sustainability	Alzoubi Y.I.; Mishra A.	2023
Green finance sources in Iberian listed firms: A socially responsible investment approach	Leitão J.; Ferreira J.; Santibanez-González E.	2023
The impact of digital inclusive finance on the growth of the renewable energy industry: Theoretical and logical Chinese experience	Wei D.; Ahmad F.; Abid N.; Khan I.	2023
Can Finland serve as a model for other developed countries? Assessing the significance of energy efficiency, renewable energy, and country risk	Wang Y.; Adebayo T.S.; Ai F.; et al.	2023
Borrower- and lender-specific determinants in the pricing of sustainability-linked loans	Pohl C.; Schüler G.; Schiereck D.	2023
Can we count on the commitment of European SMEs to achieve SGD12? An exploratory study of business sustainability	Gomes S.; Pinho M.	2023
Militarization of NATO countries sparks climate change? Investigating the moderating role of technological progress and financial development	Pata U.K.; Destek M.A.; Manga M.; Cengiz O.	2023
Role of environmental regulations, green finance, and investment in green technologies in green total factor productivity: Empirical evidence from Asian region	Tong L.; Chiappetta Jabbour C.J.; et al.	2022
Towards environmental sustainability: Do financial risk and external conflicts matter?	Ahmed Z.; Ahmad M.; Alvarado R.; et al.	2022

5. Results

The bibliometric review of climate finance and sustainability research published in the Journal of Cleaner Production between 2010 and 2024 reveals a dynamic evolution in scholarly focus and methodological approaches. Analysis of the 41 selected articles highlights three distinct phases of development: an early conceptual period from 2010 to 2015 characterized by theoretical frameworks for green financing; a transitional phase from 2015 to 2020 marked by empirical validations following the adoption of the Paris Agreement; and a contemporary

integrative phase from 2020 to 2024 examining systemic intersections with circular economy models, ESG standards, and digital technologies.

The temporal distribution of publications shows a pronounced acceleration in frequency, with nearly 60 percent of the articles published in the last five years. This trend reflects growing academic urgency around climate finance solutions. Thematically, there is a clear shift from macro-level policy discussions to micro-level implementation studies, particularly in renewable energy finance, which accounts for 28 percent of the articles, and in green bond mechanisms, comprising 22 percent. Geographically, the research exhibits strong regional concentrations, with 42 percent of studies focusing on Asia and 31 percent on Europe, while revealing limited representation from Africa and South America. This imbalance highlights a need for greater inclusivity in global research perspectives.

Methodologically, the later period demonstrates greater sophistication, combining quantitative financial analysis—employed in 58 percent of the post-2020 articles—with qualitative policy assessments. Emerging research clusters include the role of fintech in climate finance, ESG performance metrics, and sector-specific transition financing. This evolution aligns with global sustainability priorities while maintaining the journal's distinctive focus on practical, solution-oriented research at the intersection of finance and the environment.

The research is supported by a broad network of academic and policy institutions, underscoring its interdisciplinary foundation. Leading contributors include the School of Management and Economics at Beijing Institute of Technology and the World Bank's Disaster Risk Management Hub in Tokyo. Other active institutions include the Graduate School of Economics and Management at Ural Federal University, the Polytechnic of Coimbra in Portugal, Kyushu University in Japan, multiple Chinese universities, and the French CNRS - i3-CRG Interdisciplinary Innovation Research Center. This institutional diversity supports the global relevance of the research and its alignment with sustainability goals.

Keyword analysis illustrates the conceptual development of the field. Earlier studies commonly used general terms such as "green finance" and "climate change," whereas more recent articles adopt specific terminology like "financial performance," "green bonds," and "renewable energy." This progression indicates growing attention to evaluating sustainable outcomes and integrating management science with economics and environmental engineering.

Co-authorship patterns further reveal a high degree of interdisciplinary collaboration. Authors such as Gianfrate and Managi appear frequently across high-impact studies, often within international research consortia. This trend reflects the increasing prevalence of networked science in sustainability research and strengthens the field's capacity to address complex climate-finance challenges.

Sectorally, renewable energy remains the primary focus of research, with additional interest emerging in industrial and urban infrastructure applications. While the agricultural sector is crucial to climate mitigation, it remains

underrepresented in the literature, suggesting an important gap for future research. The analysis also identifies Gianfrate and Peri's (2019) article, "The Green Advantage: Exploring the Convenience of Issuing Green Bonds," as the most cited publication, with over 357 citations. Other influential studies include Tolliver et al. (2020) on green bond policy infrastructure and Damert et al. (2017) on corporate carbon strategies. These articles have shaped the trajectory of both academic inquiry and policy development.

The findings reveal that climate finance mechanisms have progressed significantly in both theory and application. Green finance has evolved from conceptual frameworks to actionable strategies that achieve optimal environmental results when integrated with supportive policy systems. Financial tools such as green taxes and blockchain technologies are increasingly used to reduce environmental degradation while maintaining economic development.

The effectiveness of climate finance is strongly influenced by governance quality and leadership. Corporate sustainability performance is shown to benefit from executives with environmental experience, while stable regulatory and political environments are key to attracting private investment in renewable energy. Studies reveal regional variations, with several Asian economies demonstrating how local green finance initiatives can scale into regional economic impacts.

Technological innovation emerges as a key driver of progress in sustainable finance. Digital platforms such as fintech applications and blockchain systems have been shown to improve transparency, efficiency, and accessibility. However, developing economies continue to face significant barriers, including inadequate infrastructure and limited technological access, which hinder the implementation of sustainable financial practices.

Policy-oriented research contributes valuable insights into the design and execution of effective strategies. While the Paris Agreement's nationally determined contributions have stimulated growth in the green bond market, further instruments are needed to support small and medium-sized enterprises in their sustainability transitions. ESG metrics have become increasingly central to modern financial decision-making, reflecting their growing integration into investment evaluation processes.

Sectoral analyses show that corporate financial performance is increasingly tied to environmental outcomes. Carbon trading mechanisms are associated with reduced default risks, while renewable energy initiatives are linked to enhanced efficiency. The agricultural sector, although less represented, presents promising new models such as the use of crowdfunding to finance climate adaptation. The cumulative findings portray climate finance as a complex and evolving field that reflects and informs the global response to environmental sustainability.

6. Conclusion

This study explores the academic development of climate finance and sustainability as presented in the Journal of Cleaner Production. The findings

reveal a clear trajectory from conceptual discussions to empirical applications, with increasing emphasis on practical implementation. Over the past decade, research has progressed from foundational definitions of green finance to detailed investigations of financial tools in relation to the UN Sustainable Development Goals.

Since the adoption of the Paris Agreement in 2015, the journal has emerged as a central forum for academic and policy engagement on sustainable finance. There has been significant growth in studies on green bonds, sustainability-linked loans, and blockchain technologies, all aimed at improving the efficiency and transparency of climate finance.

Despite notable progress, critical gaps remain. Developing countries—though disproportionately affected by climate change—are underrepresented in the literature. There is a need for deeper inquiry into neglected sectors such as agriculture and heavy industry, both of which hold substantial potential for climate-smart financial innovation.

Technological advancements, including artificial intelligence and big data, offer opportunities to revolutionize how sustainable finance is allocated and monitored. However, scaling small-scale pilot initiatives into standardized systems remains a challenge. Flexible, responsive policies that include smart tax incentives—modeled on successful examples from developed countries—are necessary to promote broader adoption.

Additionally, the social and psychological drivers of investment behavior must be more thoroughly explored. Green investment decisions are shaped not only by financial data but also by perceptions, values, and social norms, indicating a need for more interdisciplinary research.

This study provides two core contributions: it charts the historical progression of climate finance research and identifies promising future research directions. The key challenge now lies in translating financial scholarship into actionable strategies that support both environmental protection and sustainable economic development.

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