
UNDERSTANDING SUSTAINABLE FINANCE THROUGH ITS KEY DIMENSIONS: A SYSTEMATIC LITERATURE REVIEW

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Abstract:

Sustainable finance has become a central mechanism for aligning financial systems with sustainable development objectives by integrating environmental, social, and governance (ESG) considerations into financial decision-making. Despite its growing importance, the literature remains fragmented, with diverse conceptualizations, frameworks, and classifications that hinder the development of a coherent understanding of the field. This study addresses this gap by conducting a systematic literature review to identify, synthesize, and analyze the key dimensions of sustainable finance and their interrelationships. Following the PRISMA 2020 guidelines, the review examines academic publications indexed in Web of Science, Scopus, and Google Scholar between 2000 and 2026. The analysis focuses on how sustainable finance has been conceptualized across different scholarly traditions and investigates the evolution of its principal dimensions. The findings reveal that sustainable finance can be understood as a multidimensional construct comprising six interconnected dimensions: environmental, social, governance, economic and financial sustainability, institutional and regulatory, and strategic and innovation dimensions. These dimensions collectively contribute to sustainable development, financial performance, risk mitigation, and long-term value creation. The study advances the literature by proposing an integrated conceptual framework that synthesizes the multidimensional nature of sustainable finance and identifies emerging themes and future research directions. The findings provide valuable insights for researchers, practitioners, and policymakers seeking to advance sustainable finance theory and practice.

Key words: *sustainable finance; ESG; environmental, social and governance dimensions; systematic literature review; PRISMA; sustainable development; conceptual framework.*

1. Introduction

Sustainability challenges such as climate change, environmental degradation, social inequalities, and corporate governance failures have increasingly influenced the functioning of global financial systems. As governments, investors, financial institutions, and international organizations seek solutions to these interconnected challenges, sustainable finance has emerged as a central mechanism for aligning financial decision-making with long-term sustainable development objectives (Bengo et al., 2022). The concept reflects a growing recognition that financial systems play a significant role in

supporting economic growth while simultaneously addressing environmental and social concerns (Marchewitz et al., 2024; Boafo et al., 2025; Xie, 2024).

Over the past two decades, sustainable finance has evolved from a niche investment approach associated primarily with ethical and socially responsible investing into a mainstream component of global financial markets (Dinaga et al., 2023; Öcal & Küçükkocaoğlu, 2025). The increasing integration of environmental, social, and governance (ESG) considerations into investment decisions, risk assessment processes (Schoenmaker, 2017; Naeem M.A et al., 2024; Șerban et al., 2025; Tagui & Regragui, 2026), corporate strategies (Wibowo et al., 2025; Stoicescu & Sima, 2025), and regulatory frameworks (Ehlers et al. 2021) demonstrate the growing importance of sustainability within financial systems (Postuła & Lipski, 2024). International initiatives such as the United Nations Sustainable Development Goals (SDGs), the Paris Climate Agreement, and the development of sustainable finance taxonomies (Achterfeldt & Traverso, 2026) have further accelerated this transformation by encouraging the redirection of capital toward sustainable economic activities.

Despite the rapid growth of sustainable finance research and practice, the field remains characterized by significant conceptual diversity. Scholars have proposed numerous definitions, frameworks (Bătușaru & Rădoiu, 2022; Jenei et al., 2024) and classification systems, often emphasizing different aspects of sustainability and finance (Chong & Ali, 2026). As a result, sustainable finance has increasingly been viewed as a multidimensional construct encompassing environmental, social, governance, economic, institutional, regulatory, and innovation-related dimensions (Ma'ruf et al., 2021; Ayaz & Zahid, 2023). While this diversity reflects the complexity of sustainability challenges, it also contributes to conceptual fragmentation and limits the development of a coherent body of knowledge.

The growing volume of academic research has generated valuable insights into specific areas such as ESG investing (Sica et al., 2023; Oprean-Stan et al. 2026), green finance (Gao et al., 2024), climate finance (Zhou & Alnafrh, 2025; Ahmad et al. 2026), sustainable banking (Aracil et al., 2021), impact investing and responsible investment (Zetzsche et al., 2022). However, existing review studies have largely focused on individual subdomains of sustainable finance rather than examining the broader dimensional architecture of the field. Consequently, there remains a limited understanding of how different dimensions of sustainable finance are conceptualized, categorized, and interconnected across the literature.

This gap is particularly important because the dimensions through which sustainable finance is understood directly influence the design of financial products, investment strategies, sustainability assessment frameworks, regulatory initiatives, and corporate decision-making processes. A systematic examination of these dimensions can therefore contribute to greater theoretical clarity, support the harmonization of conceptual frameworks, and facilitate more effective implementation of sustainable finance practices.

To address this gap, this study conducts a systematic literature review of sustainable finance research published between 2007 and 2026. Following the PRISMA 2020 framework, the review systematically identifies, evaluates, and synthesizes academic contributions addressing the dimensions and conceptual foundations of sustainable

finance. Unlike previous reviews that primarily focus on specific sustainable finance instruments or ESG applications, this study adopts a broader integrative perspective by examining sustainable finance as a multidimensional construct and exploring the relationships among its constituent dimensions.

The study pursues four objectives: (1) to identify and synthesize the principal dimensions and conceptual frameworks of sustainable finance; (2) to examine how different scholarly perspectives define and categorize ESG dimensions within sustainable finance; (3) to identify emerging themes and research gaps; and (4) to compare theoretical and empirical approaches to sustainable finance dimensions.

Accordingly, the review addresses the following research questions:

RQ1. What are the key dimensions and conceptual frameworks of sustainable finance identified in the academic literature?

RQ2. How do different scholarly perspectives define and categorize the environmental, social, and governance dimensions within sustainable finance?

RQ3. What are the emerging themes and research gaps in the literature regarding sustainable finance dimensions?

RQ4. How do theoretical and empirical studies differ in their treatment of sustainable finance dimensions?

By answering these questions, the study contributes to the sustainable finance literature by providing a comprehensive synthesis of its conceptual foundations, identifying the principal dimensions that characterize the field, and proposing a more integrated understanding of sustainable finance as a multidimensional research domain.

The remainder of the paper is organized as follows. Section 2 reviews the theoretical and conceptual foundations of sustainable finance. Section 3 presents the research methodology and systematic review procedures. Section 4 reports the results of the review. Section 5 discusses the findings and their implications for theory and practice. Finally, Section 6 concludes the paper and identifies directions for future research.

2. Literature review

2.1 Evolution of Sustainable Finance

The concept of sustainable finance has developed significantly over the past two decades, evolving from socially responsible investing and ethical finance toward a comprehensive framework that seeks to align financial systems with sustainable development objectives (Luo et al., 2022; Sárvári et al., 2026). Early approaches focused primarily on excluding investments in controversial industries and incorporating ethical considerations into investment decisions (Nobanee et al., 2023). Over time, sustainable finance expanded to include ESG integration, impact investing, climate finance, green finance, sustainable banking, and transition finance (Kashi & Shah, 2023; Kumar et al., 2022; Ziolo et al., 2026).

The increasing recognition of climate-related financial risks, social inequalities, and governance failures has contributed to the mainstream adoption of sustainable finance principles (Edmans & Kacperczyk, 2022; Dou et al., 2025; Malone et al., 2025). Simultaneously, international initiatives such as the Sustainable Development Goals (SDGs) and the Paris Agreement have reinforced the role of finance in supporting

sustainable development (Monasterolo & de Angelis, 2020; Raman et al., 2025; Ziolo et al., 2021). Recent studies indicate that sustainable finance is no longer viewed solely as a mechanism for risk management but increasingly as a strategic tool for generating long-term value creation (Rădoiu et al., 2025) and supporting societal transformation (Schoenmaker, D., 2017; Schoenmaker, D., & Schramade, W., 2019; Kölbel, J. F., et al., 2020, Kashi, A., & Shah, M. E., 2023).

2.2 Conceptual Foundations of Sustainable Finance

Although there is broad agreement that sustainable finance incorporates sustainability considerations into financial decision-making, no universally accepted definition exists, as the field is characterized by heterogeneous concepts, definitions, industry standards, and policy frameworks (Migliorelli, 2021; Cunha et al., 2021). Existing conceptualizations vary according to disciplinary perspectives, institutional contexts, and normative assumptions (Barnow, 2026; Partiti, 2024).

Several theoretical perspectives have influenced the development of sustainable finance. Stakeholder theory emphasizes the responsibility of organizations toward a broad range of stakeholders beyond shareholders (Gangi et al., 2019; Chapagain et al., 2025; Alamgir, 2026). Institutional theory highlights the role of regulatory frameworks, social norms, organizational legitimacy, and institutional pressures in shaping sustainable finance practices (Dev et al, 2025; Muñoz et al., 2026; Arslan et al., 2025; Zarrouk et al., 2026). Ecological economics focuses on the relationship between financial systems and environmental limits, particularly through green finance and sustainable bond markets (Laborda & Sánchez-Guerra, 2021; Zhai et al., 2024), while ethical finance emphasizes moral and normative considerations in capital allocation decisions (Nobanee et al., 2023; Aljandali et al., 2026). These theoretical perspectives have contributed to a diverse range of frameworks that conceptualize sustainable finance as a mechanism for balancing economic performance with environmental and social objectives.

2.3 ESG as the Dominant Framework

The ESG framework represents the most widely adopted conceptual structure within sustainable finance (Edmans & Kacperczyk, 2022). The environmental dimension focuses on climate change, resource efficiency, pollution prevention, biodiversity protection, and environmental stewardship, while the social dimension encompasses labor practices, human rights, diversity and inclusion, community relations, and social equity. The governance dimension addresses board structures, transparency, accountability, ethics, and stakeholder engagement.

The popularity of ESG has been driven by its ability to provide a standardized framework for evaluating sustainability-related risks and opportunities (Alam et al., 2026). Consequently, ESG has become central to investment analysis, sustainability reporting, regulatory initiatives, and corporate governance practices (Edmans & Kacperczyk, 2022, Ogreaan et al., 2026).

However, researchers have also highlighted several limitations of ESG-based approaches, including inconsistencies in ESG ratings, measurement challenges, and difficulties in capturing

complex sustainability interactions (Arslan et al., 2025). These limitations have encouraged the development of alternative and expanded conceptual frameworks (Hughes et al., 2025).

2.4 Sustainable Finance as a Multidimensional Construct

Recent literature increasingly conceptualizes sustainable finance as a multidimensional construct rather than solely an ESG-based framework, emphasizing the interaction between financial mechanisms, policy frameworks, governance structures, technological innovation, and sustainability transitions (Joo et al., 2026; Zaporozhets et al., 2026; Hassan et al., 2025). Beyond environmental, social, and governance dimensions, scholars have proposed additional dimensions including economic, institutional, regulatory, technological, and innovation-related components (Fan et al., 2025; Khan et al., 2026; Braga & Ernst, 2023). The economic dimension focuses on long-term value creation, financial resilience, and sustainable economic growth (Braga & Ernst, 2023, Stan et al., 2024). The institutional dimension addresses the role of regulatory systems, public policies, and governance structures in facilitating sustainable finance (Ülgen, 2024). The innovation dimension emphasizes technological transformation, fintech solutions, and new financial instruments supporting sustainability transitions (Khan et al., 2026; Strielkowski, 2024; Yang et al., 2026).

This multidimensional perspective reflects the growing complexity of sustainable finance and recognizes that sustainability challenges cannot be adequately addressed through isolated ESG considerations alone, but requires integrated financial ecosystems, policy coordination, governance mechanisms, and innovation pathways (Zaporozhets et al., 2026).

2.5 Emerging Dimensions in Sustainable Finance Research

The literature reveals several emerging dimensions that extend beyond traditional ESG frameworks, including biodiversity finance, justice-oriented transition frameworks, digital finance, sustainable innovation, systemic financial stability, and resilience (Flammer, 2026; George et al., 2025).

One important development is the growing emphasis on biodiversity and nature-related finance. Researchers increasingly argue that climate-focused approaches are insufficient for addressing broader environmental challenges and advocate for integrating biodiversity considerations into sustainable finance frameworks (Flammer et al., 2025; Suárez-Giri et al., 2026; Thompson, 2023).

Another emerging theme is the concept of a just transition, which links environmental objectives with social equity considerations. This perspective recognizes that sustainability transitions generate both opportunities and risks for workers, communities, and vulnerable populations (Minocha et al., 2025; Braga & Ernst, 2023).

Additional emerging dimensions include transition finance, digital sustainability, sustainable innovation, systemic financial stability, and resilience. These developments indicate that sustainable finance continues to evolve in response to emerging sustainability challenges and changing stakeholder expectations (Hassan et al., 2026; Chien et al., 2025; Alkatheeri et al., 2026; Zhou et al., 2026).

2.6 Existing Reviews and Research Gap

Several literature reviews and bibliometric studies have examined specific aspects of sustainable finance, including green finance, ESG investing, responsible investment, sustainable banking, climate finance, and sustainability reporting (Jayaram & Singh, 2020; Carè & Weber, 2023; Debrah et al., 2023). These studies have contributed significantly to understanding the growth, intellectual structure, and thematic evolution of the field (Singhania et al., 2024; Tung et al., 2025; Hu & Gan, 2025).

Nevertheless, most existing reviews focus on particular instruments, sectors, or thematic areas, such as green finance, climate finance, sustainable banking, socially responsible investment, and sustainability measurement methods (Akomea-Frimpong et al., 2022; Koenigsmarck & Geissdoerfer, 2023; Popescu et al., 2021). Relatively limited attention has been devoted to understanding sustainable finance as a multidimensional construct and systematically examining how different dimensions are conceptualized, categorized, and interconnected across the literature (Nedopil et al., 2020, Zairis et al., 2024).

Consequently, there remains a need for a comprehensive synthesis capable of identifying the principal dimensions of sustainable finance, evaluating their theoretical foundations, and examining their relationships within a broader conceptual framework. Addressing this gap constitutes the primary motivation for the present systematic literature review.

2.7 Proposed Conceptual Framework

The literature reviewed in the preceding sections demonstrates that sustainable finance has evolved into a complex and multidimensional field characterized by diverse theoretical foundations, conceptual interpretations, and practical applications (Lvova et al., 2019; Bagarti & Pahwa, 2026). While existing studies have contributed significantly to understanding specific aspects of sustainable finance, there remains limited consensus regarding the principal dimensions that collectively define the field and explain its contribution to sustainable development objectives (Zhang et al., 2019; Chan et al., 2026). This conceptual fragmentation underscores the need for an integrative framework capable of synthesizing the various dimensions identified across the literature into a coherent structure (Jamali & Voghouei, 2026; Ozili, 2021).

Such a framework can facilitate a more systematic understanding of sustainable finance by highlighting the relationships among its environmental, social, governance, economic, institutional, and innovation-related components (Zheng et al., 2021). Moreover, it provides a foundation for future empirical investigations, supports the development of more consistent classification systems, and assists policymakers, practitioners, and researchers in navigating the increasingly complex sustainable finance domain (Sachdeva et al., 2026; Prakash & Sethi, 2022). Based on the synthesis of the literature, the present study proposes a conceptual framework that organizes the key dimensions of sustainable finance and illustrates their collective contribution to sustainability and financial outcomes. The framework, presented in Figure 1, serves as the theoretical foundation for the subsequent analysis and interpretation of the systematic literature review findings.

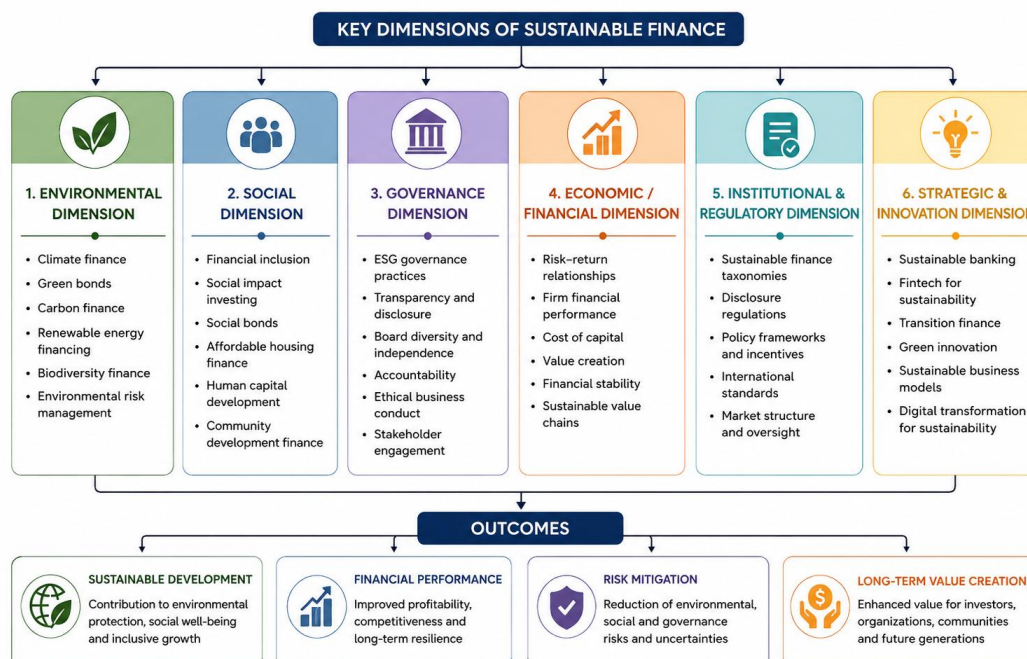


Figure 1. Conceptual framework of sustainable finance dimensions
Source: Authors' synthesis based on the systematic literature review

As illustrated in **Figure 1**, sustainable finance can be understood as a multidimensional construct comprising six interrelated dimensions: environmental, social, governance, economic and financial sustainability, institutional and regulatory, and strategic and innovation dimensions. Together, these dimensions influence a range of outcomes, including sustainable development, financial performance, risk mitigation, and long-term value creation. The framework highlights both the breadth of sustainable finance research and the interconnected nature of the mechanisms through which finance contributes to sustainability objectives.

3. Methodology

3.1. Research Design and Protocol

This study employs a systematic literature review to synthesize the academic literature on the dimensions of sustainable finance. The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines, which constitute the current standard for the planning, execution, and reporting of systematic reviews. This methodological choice is justified by the interdisciplinary and conceptually dispersed nature of sustainable finance, a field that intersects finance, economics, sustainability science, environmental studies, public policy, and corporate governance.

3.2. Search strategy and data collection

A multi-database search strategy was employed to ensure comprehensive coverage of the sustainable finance literature. Three complementary databases were consulted: Web of Science, Scopus, and Google Scholar. The search covered January 2007 to June 2026, a timeframe selected to capture the consolidation and rapid expansion of sustainable finance as a distinct field of academic inquiry, coinciding with the growing adoption of ESG principles, responsible investment frameworks, and sustainability-oriented financial regulations.

The search strategy was built around the core concepts of sustainable finance, ESG, sustainable investment, and conceptual frameworks. Search queries focused on sustainable finance dimensions, conceptual frameworks, ESG categorizations, and taxonomies.

3.3. Screening and Eligibility Procedures

The study selection process followed the PRISMA 2020 framework and consisted of four sequential stages: identification, screening, eligibility assessment, and final inclusion. As illustrated in **Figure 2**, the review process began with 953 records retrieved from Web of Science, Scopus, and Google Scholar. Following the removal of duplicate records, non-English publications, and studies published outside the selected period, 774 records were retained for screening. Subsequent title and abstract screening resulted in the exclusion of 305 records, while full-text eligibility assessment led to the exclusion of an additional 228 studies.

Studies were included if they explicitly examined the conceptualization, dimensions, frameworks, taxonomies, or classifications of sustainable finance; provided definitions, categorizations, or interpretations of environmental, social, and governance (ESG) dimensions within a financial context; employed a clearly defined theoretical, conceptual, empirical, or mixed-method approach; contributed to the understanding of thematic developments, emerging trends, conceptual debates, or research gaps in sustainable finance; and were published between 2007 and 2026 with clearly reported objectives, methodology and findings.

The final sample consisted of 241 articles, providing a systematic and representative basis for the bibliometric and content analyses undertaken in this study.

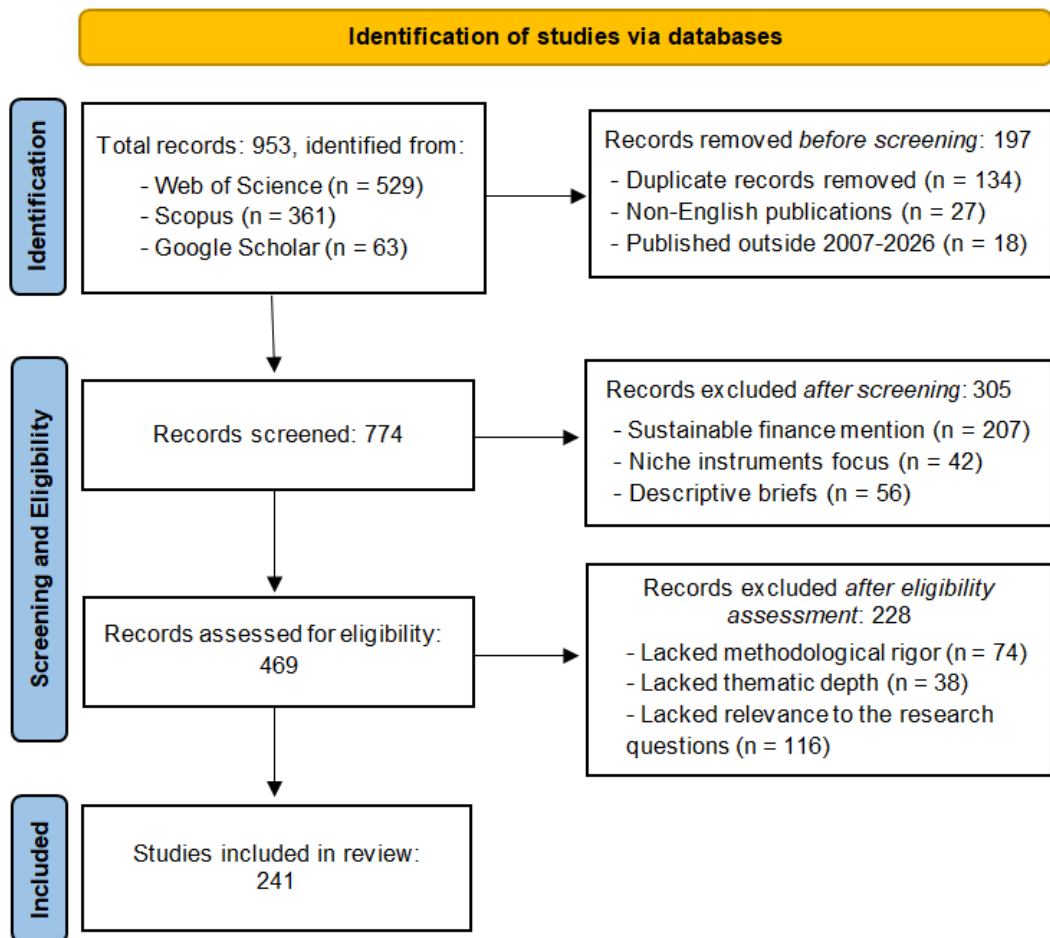


Figure 2. PRISMA flow diagram of the study selection process

3.4. Analytical Framework

To provide a comprehensive answer to the research questions, the study adopted a mixed analytical approach that integrates bibliometric techniques with qualitative content analysis. Bibliometric analyses were conducted using the Bibliometrix package and its Biblioshiny interface within the R statistical environment (version 4.6.0). The analytical procedure was structured around several complementary stages designed to capture both the quantitative evolution and the intellectual development of the sustainable finance literature.

The first stage focused on scientific performance, examining publication dynamics, leading authors, country contributions, and collaboration patterns in order to identify the main actors and the evolution of scholarly interest in sustainable finance. The second stage explored the intellectual and conceptual structure of the field through keyword co-occurrence networks, abstract bigram analyses, conceptual structure mapping, and thematic relationship analyses. Subsequently, thematic analyses were employed to examine the evolution, maturity, and relevance of research themes over time.

4. Results/findings

The results presented in this section focus on bibliometric data extracted and processed through the R-based Biblioshiny interface, which enabled a structured, multi-layered examination of the sustainable finance literature according to the analytical framework presented previously. Rather than offering isolated metrics, the findings are interpreted in an integrated manner, with the aim of building a coherent presentation of where the field stands and where it is heading.

4.1. Performance Analysis

4.1.1 Publication and Growth Trends

Figure 3 illustrates the evolution of scientific production on sustainable finance dimensions between 2007 and 2026. The results reveal a relatively limited level of scholarly activity during the emergence phase (2007–2016), characterized by sporadic publications and low annual output. A gradual increase is observed from 2017 onward, reflecting growing academic interest in sustainable finance, ESG integration, and sustainability-related financial policies. The most significant expansion occurs after 2020, indicating the consolidation of sustainable finance as a distinct research field. Publication output reaches its highest level in 2025, suggesting intensified scholarly attention driven by increasing regulatory developments, climate-related financial risks, and the mainstream adoption of ESG frameworks. The lower value observed in 2026 should be interpreted cautiously, as the dataset covers only part of the year.

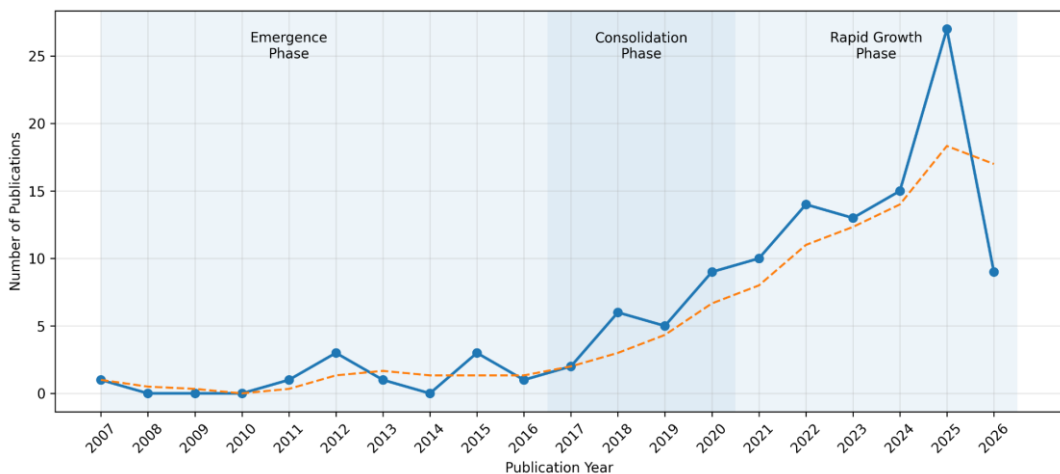


Figure 3. Annual scientific production on sustainable finance dimensions (2007–2026)

The growth trajectory illustrated in **Figure 3** is further reflected in the geographical distribution of scientific production presented in **Figure 4**. While publication activity remained relatively limited during the early years of the study period, the sharp increase observed after 2020 coincided with a significant expansion of research contributions across different regions of the world.

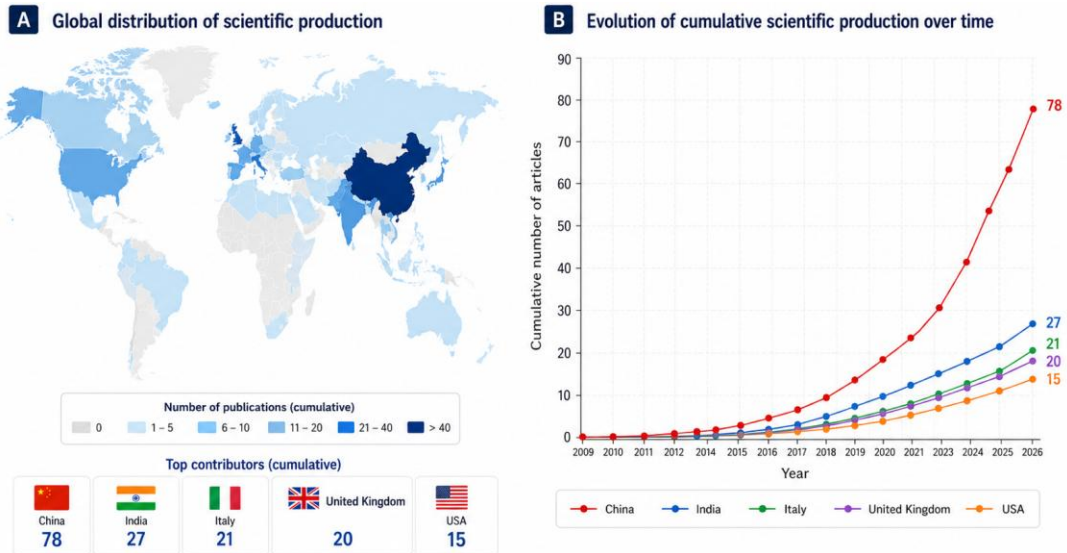


Figure 4. Geographical distribution and evolution of scientific production by country

As shown in **Figure 4**, the geographical and temporal distribution of scientific production reveals a highly uneven contribution across countries, with China emerging as the dominant source of publications, followed by India, Italy, the United Kingdom, and the United States. The acceleration observed after 2020 is particularly pronounced among the leading contributors, reflecting the growing international interest in sustainable finance and related topics.

While the country-level analysis identifies where this research is being produced and how national contributions have evolved over time, it does not fully capture the overall developmental trajectory of the field. To address this dimension, the life-cycle analysis presented in **Figure 5** examines the temporal evolution of the literature as a whole, providing insight into the maturity, growth dynamics, and future prospects of sustainable finance research.

The life-cycle model indicates that sustainable finance research has experienced a rapid expansion phase during the last decade. Publication activity remained limited until the late 2010s, followed by a sharp increase after 2020, consistent with the trends observed in the country-level analysis. Publication activity increased substantially during the last five years of the observation period, culminating in a peak estimated at 2025. The high coefficient of determination ($R^2 = 0.967$) indicates an excellent fit between the observed data and the life-cycle model, suggesting a highly consistent growth pattern within the field. Rather than indicating a decline, the projected stabilization beyond the peak should be interpreted as a sign of maturation, suggesting that sustainable finance has moved beyond its formative stage and is becoming an established and increasingly specialized field within the broader finance and sustainability literature.

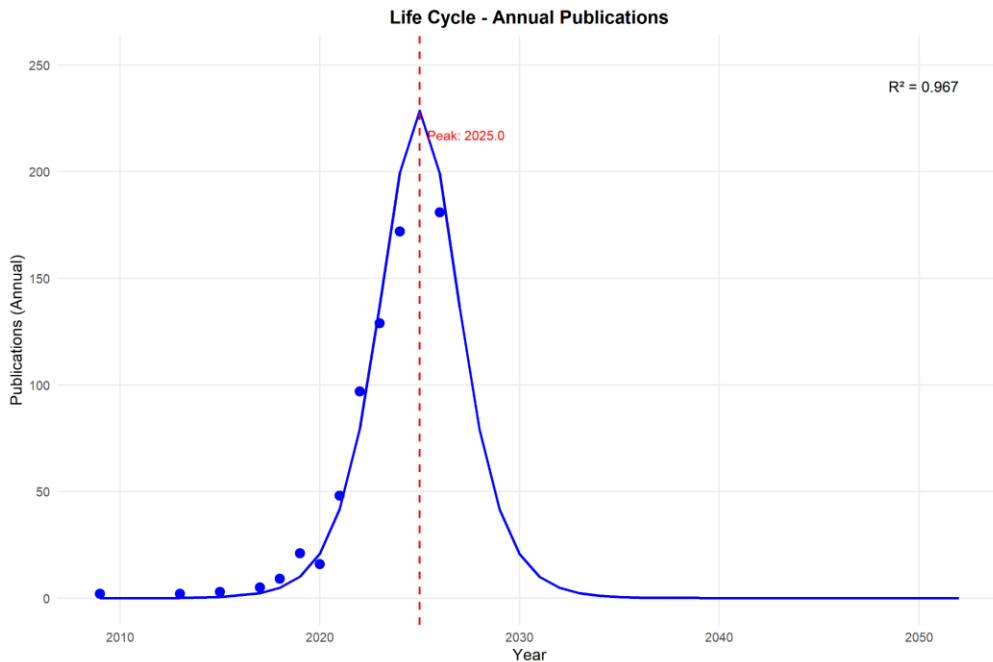


Figure 5. Life-cycle trajectory of sustainable finance research based on annual publication output

Together, the country's production and life-cycle analyses demonstrate that the recent surge in scientific output is driven both by the expansion of global participation and by the consolidation of sustainable finance as a major research area.

4.1.2 Social Structure Analysis - Authors performance and Collaboration networks

The intellectual and collaborative structure of the sustainable finance literature can be further understood through an examination of author productivity, country-level research output, and international collaboration patterns. These indicators provide insights into the actors driving the field's development and the extent to which knowledge production is embedded in global research networks.

Figure 6 presents the most productive authors in the dataset. The distribution is relatively concentrated, with Wang Y emerging as the leading contributor, accounting for 18 publications. A second group of highly productive scholars, including Naeem M.A. and Zhang Y, each contributed 10 publications, while several others produced between 7 and 9 articles. This pattern suggests that the literature is shaped by a limited number of recurring contributors who have played a central role in advancing research on sustainable finance.

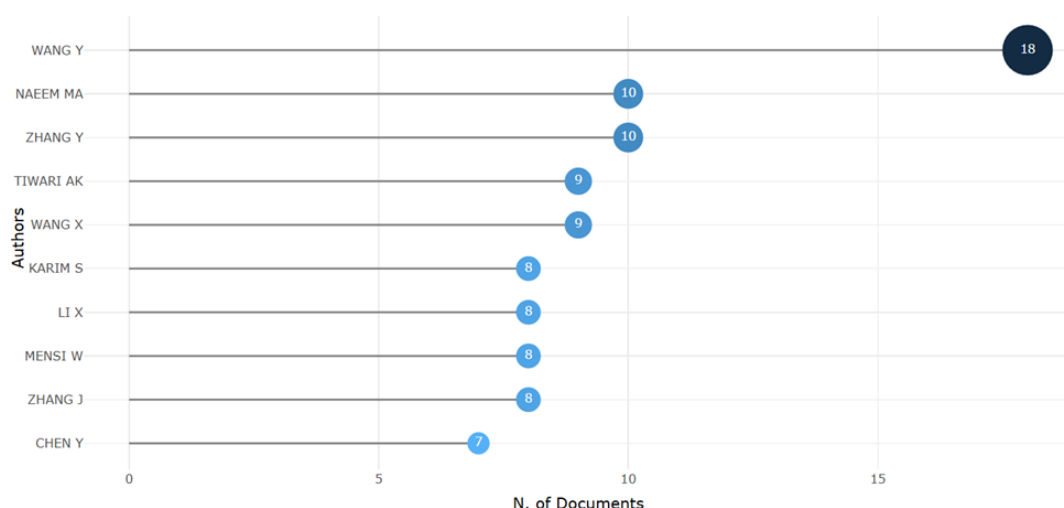


Figure 6. Leading authors by publication output in the sustainable finance literature (2007–2026).

The prominence of authors with East Asian affiliations mirrors the geographical distribution of scientific production identified in the country-level analysis, where China occupies a dominant position. The concentration of publications among a small group of scholars is characteristic of emerging and rapidly expanding research domains, in which a core set of researchers often establishes the conceptual and methodological foundations of the field.

The distribution of corresponding authors by country (**Figure 7**) reveals substantial differences in national research output. China clearly dominates the field, followed by India, Italy, the United Kingdom, and the United States. In most countries, single-country publications (SCP) exceed multiple-country publications (MCP), indicating that research activity remains largely driven by domestic scholarly communities. Nevertheless, the presence of MCP contributions across nearly all leading countries highlights a growing tendency toward international cooperation.

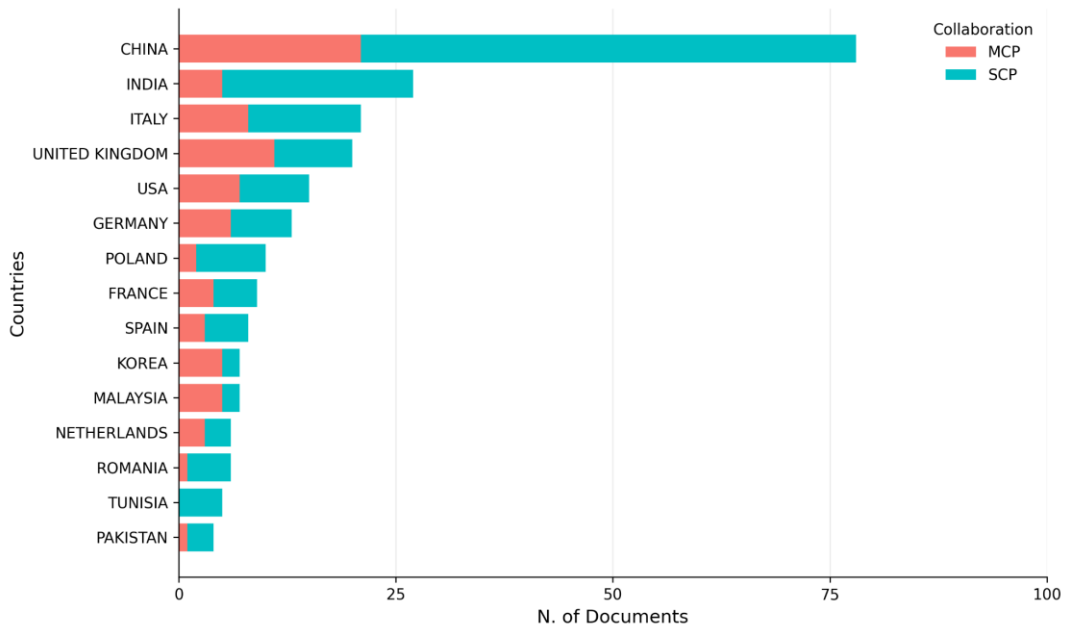


Figure 7. Corresponding author countries and Collaboration structure in sustainable finance research.

China's leading position is particularly noteworthy. Beyond producing the highest number of publications, it also exhibits a considerable volume of international collaborations. Similar patterns can be observed for the United Kingdom, Italy, and India, although at a smaller scale. The country-level collaboration profile further suggests that the expansion of sustainable finance scholarship is increasingly supported by international research networks, particularly among the leading publishing nations. These findings reinforce the results of the scientific production analysis, which identified these countries as the principal contributors to the expansion of sustainable finance research over the last decade. At the same time, the presence of countries such as Romania, Tunisia, Pakistan, Saudi Arabia, and Indonesia indicates the growing geographical diversification of the field.

The international collaboration map (**Figure 8**) provides a complementary perspective by illustrating the connections among countries involved in sustainable finance research. The network exhibits a high degree of international integration, with collaboration links spanning North America, Europe, Asia, and Oceania. China appears as the principal hub within the network, maintaining extensive research ties with both developed and emerging economies. Strong collaborative relationships are also visible among European countries, as well as between Asian and Western research centers.

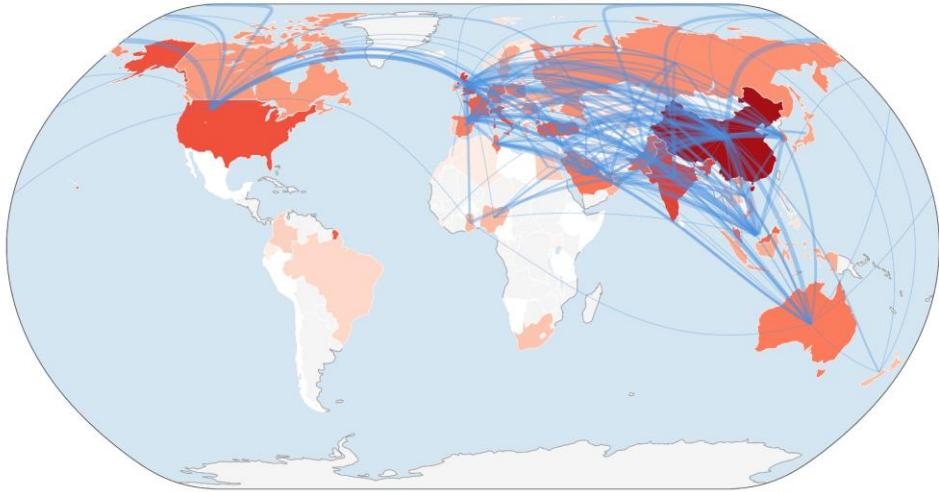


Figure 8. Global country collaboration network in sustainable finance research

The density of cross-border linkages suggests that sustainable finance has evolved into a genuinely global research agenda. The prominence of international collaborations reflects the transnational nature of challenges such as climate change, sustainable investment, and green financial regulation, which require shared analytical frameworks and comparative perspectives. Moreover, the collaboration network helps explain the rapid growth observed in annual scientific production, as the increasing internationalization of research activities has facilitated the diffusion of knowledge and the expansion of scholarly output across regions.

4.2. Intellectual Structure Analysis

4.2.1 Conceptual Structure

To explore the intellectual structure of the field, **Figure 9** presents a three-field plot linking authors' countries of affiliation, title keywords, and abstract keywords, in order to provide insights into the geographical distribution of research activity and the thematic connections that characterize the sustainable finance literature.

The results reveal a strong geographical concentration of sustainable finance research, with China emerging as the most productive contributor, followed by countries such as India, Italy, the United States, the United Kingdom, Malaysia, and Pakistan. The dominant position of China is evidenced by the thickness of the flows connecting Chinese publications to the most frequent title and abstract terms, indicating a substantial contribution to the development of the field.

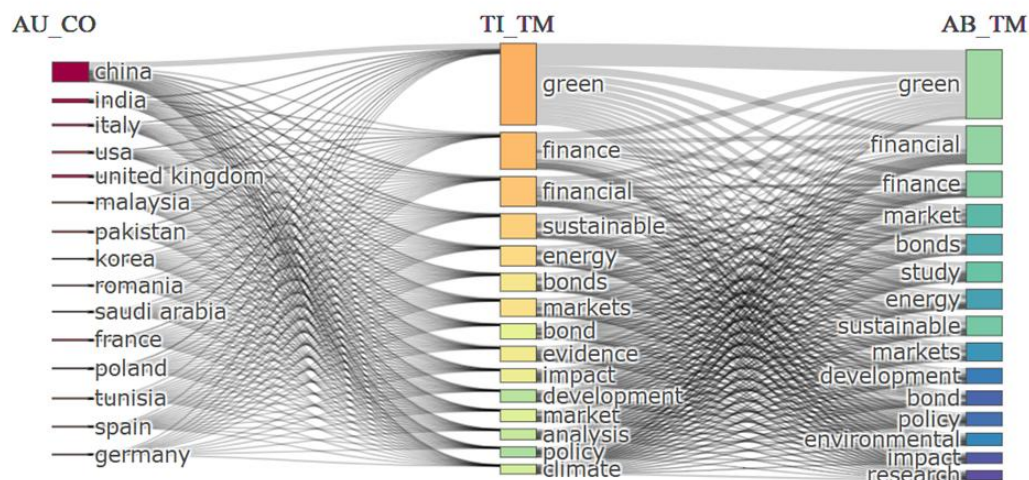


Figure 9. Geographical and thematic structure of sustainable finance research

The central column identifies the most frequently occurring terms in article titles. Keywords such as “green,” “finance,” “financial,” “sustainable,” “energy,” and “bonds” dominate the literature, highlighting the strong emphasis on green finance, sustainable investment, energy transition, and sustainable financial markets. The prominence of terms such as “policy,” “climate,” “impact,” and “development” further suggests that regulatory frameworks and sustainability outcomes constitute important areas of scholarly inquiry.

The abstract keyword analysis, on the right column, confirms these patterns. The most frequent concepts include “green,” “financial,” “finance,” “market,” “bonds,” “energy,” “sustainable,” and “development,” indicating that research is primarily focused on the interaction between financial systems and environmental sustainability objectives. The strong connections between title and abstract keywords demonstrate a high degree of thematic consistency across the literature.

According to the data presented, the figure suggests that the sustainable finance field is largely driven by research on green finance, sustainable financial markets, green bonds, climate-related policies, and energy transition, with Asian countries, particularly China, playing a leading role in consolidating the intellectual field of the concept. These findings also indicate that environmental considerations remain the dominant dimension of sustainable finance research, while social and governance aspects appear comparatively less prominent within the analyzed data set.

Figure 10 presents a word cloud illustrating the most frequently occurring keywords in the sustainable finance literature. Three keywords clearly dominate the field: *green finance*, *sustainable finance*, and *green bonds*, indicating that these topics constitute the principal focus of contemporary research. Their central position and larger size suggest a strong concentration of research on financial instruments and mechanisms supporting environmental sustainability and low-carbon transitions.



Figure 10. Keyword frequency distribution in the Sustainable Finance literature

Other highly visible terms, including *sustainable development*, *climate change*, *sustainability*, *ESG*, *financial markets*, and *renewable energy*, reveal the strong interconnection between financial activities and broader environmental and developmental objectives. The presence of keywords such as *impact investing*, *climate finance*, *financial development*, *connectedness*, and *energy transition* further suggests a diversification of research interests toward market dynamics, sustainability performance, and climate-related financial risks.

The word cloud provides a concise synthesis of the intellectual focus of the literature and corroborates previous findings that sustainable finance research is increasingly organized around three interconnected domains: *green finance and green bonds*, *sustainable development and ESG integration*, and *climate-related financial challenges and opportunities*. The predominance of environmental and financial terms also reinforces the conclusion that the environmental dimension remains the most extensively studied component of sustainable finance, although governance, investment, and development-related themes are gaining increasing attention.

Figure 11 presents the keyword co-occurrence network of the sustainable finance literature, revealing the main conceptual clusters and their interrelationships.

Three dominant thematic communities emerge. The red cluster, centred on **green finance**, represents the largest and most interconnected research stream. It is strongly associated with topics such as *renewable energy*, *sustainable development*, *financial development*, *economic growth*, and *innovation*, highlighting the role of finance in supporting environmental transitions and sustainable economic outcomes. The blue cluster, organised around **green bonds**, focuses on financial market dynamics and investment-related issues. Keywords such as *risk*, *financial markets*, *uncertainty*, *clean energy*, and *connectedness* indicate a growing interest in the performance, volatility, and market integration of sustainable financial instruments. The prominence of green bonds

confirms their position as one of the most intensively studied mechanisms within sustainable finance. The green cluster, centred on **sustainable finance**, encompasses broader governance and sustainability-related themes, including *ESG*, *corporate social responsibility*, *sustainability*, *performance*, and *investment*. This cluster reflects research examining how sustainability principles are incorporated into financial decision-making and organisational practices.

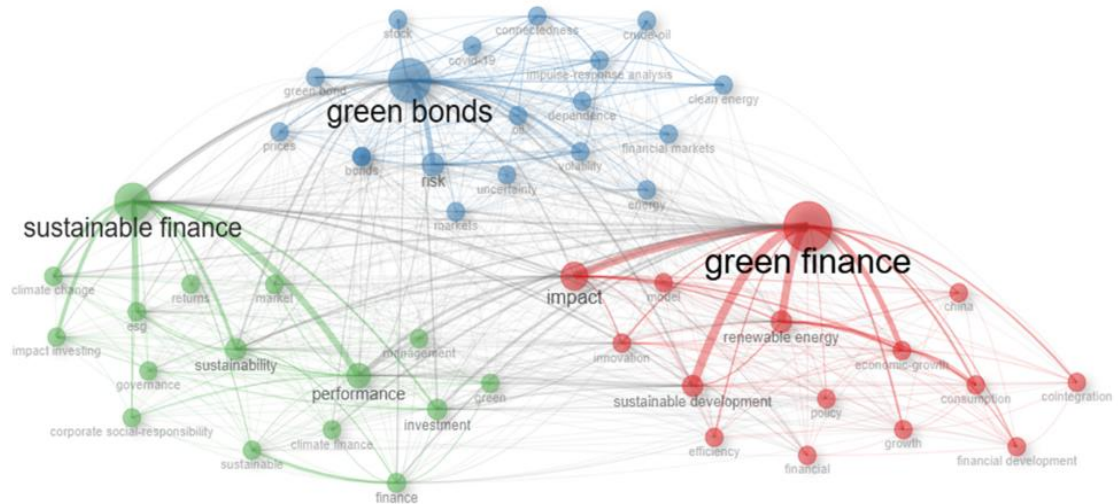


Figure 11. Intellectual structure of sustainable finance literature based on keyword co-occurrence analysis.

The network structure confirms and extends the findings of the previous word cloud analyses. At the same time, *sustainable finance* remains a central bridging concept connecting environmental, social, governance, and financial perspectives. The dense interconnections among the three clusters indicate a high degree of thematic integration, suggesting that contemporary research increasingly examines sustainable finance through the combined lenses of sustainability performance, green financial instruments, climate-related challenges, and sustainable economic development.

While the keyword co-occurrence network provides an overview of the conceptual relationships derived from author-assigned keywords, these terms reflect only the topics explicitly emphasized by researchers. To obtain a broader and more detailed representation of the field's intellectual structure, a complementary co-occurrence analysis was conducted using abstract bigrams (**Figure 12**). Because abstracts contain a richer description of research objectives, methods, and findings, bigram analysis captures latent thematic connections that may not be fully represented by keywords alone, thereby offering a more comprehensive view of the conceptual foundations and emerging directions of sustainable finance research.

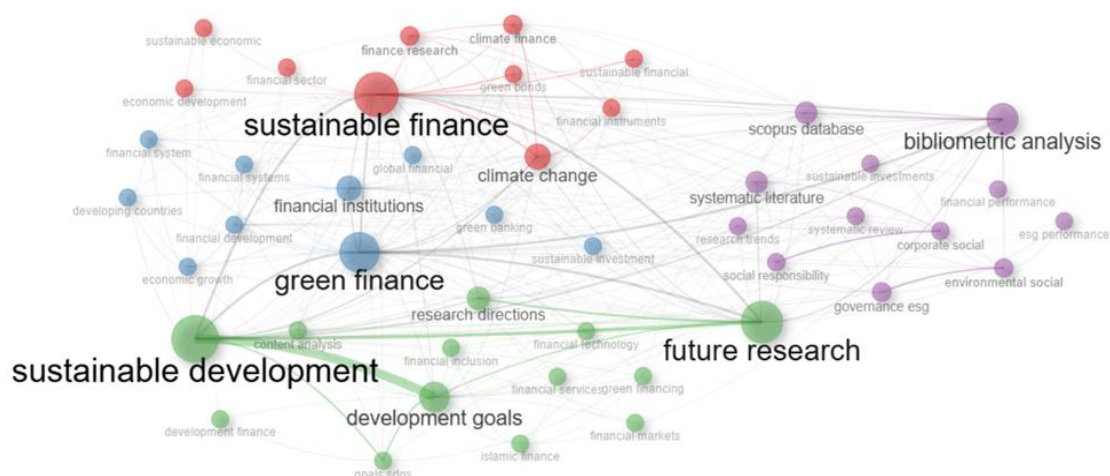


Figure 12. Intellectual structure of sustainable finance literature: a network analysis of abstract bigrams.

The size of the nodes reflects the frequency of occurrence, while the links indicate the strength of relationships between concepts. Four interconnected thematic clusters can be identified.

The first cluster is centred on *sustainable finance*, *climate change*, and *climate finance*, highlighting the growing importance of environmental and climate-related considerations within financial systems. A second cluster revolves around *green finance* and *financial institutions*, emphasizing the role of financial intermediaries and market mechanisms in supporting sustainability transitions. A third cluster links *sustainable development*, *development goals*, and related concepts, reflecting the close connection between sustainable finance and broader sustainability objectives. Finally, a fourth cluster is organized around *bibliometric analysis*, *systematic literature*, *ESG performance*, and *corporate social responsibility*, indicating the increasing use of review-based and evaluative approaches to understand the evolution of the field.

The network structure reinforces the findings of the previous analyses. Concepts such as *sustainable finance*, *green finance*, *climate change*, and *sustainable development* occupy central positions and act as bridges between different research streams, confirming their role as the core pillars of the literature. At the same time, the prominence of *future research* as a highly connected node suggests that the field remains dynamic and continues to generate new avenues of inquiry. The figure highlights the multidimensional nature of sustainable finance research, where environmental, financial, developmental, and governance-related themes are increasingly integrated within a common conceptual framework.

After examining the co-occurrence networks of author keywords and abstract bigrams, a further step was undertaken to identify the underlying conceptual dimensions that organize the literature by performing a Multiple Correspondence Analysis (MCA). The resulting conceptual structure map presented in **Figure 13**, offers a synthetic view of the intellectual architecture of sustainable finance research and highlights the relationships among its dominant themes and emerging research directions.

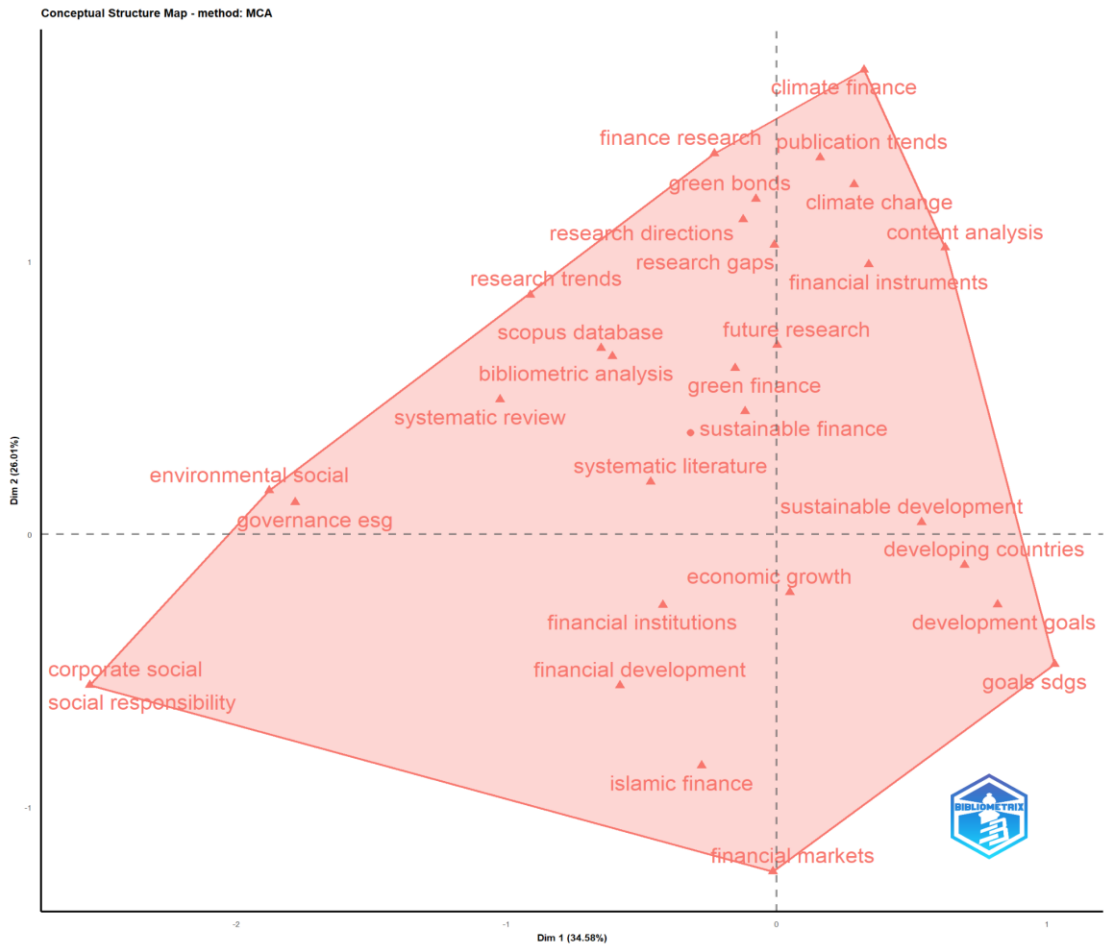


Figure13. Conceptual map of sustainable finance themes derived from abstract bigrams using Multiple Correspondence Analysis (MCA)

The cluster surrounding “*research gaps*”, “*future research*”, “*research directions*”, and “*publication trends*” occupies a central position within the conceptual structure map, indicating that a substantial portion of the literature is devoted to assessing the current state of knowledge and identifying unresolved issues in sustainable finance. Its close proximity to terms such as *green finance*, *sustainable finance*, *green bonds*, *climate finance*, and *financial instruments* suggests that many studies are not only examining these topics empirically but are also critically evaluating their theoretical development, methodological limitations, and future research needs.

The prominence of this cluster reflects the relative novelty and rapid evolution of the field. Researchers frequently highlight the need for stronger conceptual frameworks, greater methodological consistency, and deeper investigation of the relationships between financial mechanisms and sustainability outcomes. The association with *bibliometric analysis*, *systematic review*, and *systematic literature* further indicates that the identification of research gaps has become a research stream in its own right, aimed at consolidating fragmented knowledge and guiding future scholarly inquiry.

From a substantive perspective, the location of this cluster suggests that future research is expected to focus on the effectiveness of green financial instruments, the integration of ESG considerations into financial systems, the role of climate finance in supporting sustainable development, and the measurement of sustainability impacts. The centrality of these terms highlights an ongoing effort within the literature to move from descriptive analyses toward more complex theoretical and empirical explanations of how sustainable finance contributes to environmental and socio-economic objectives.

4.2.2 Thematic Structure

Figure 14 presents a thematic map that classifies the principal research themes in sustainable finance according to their centrality (relevance within the overall field) and density (degree of internal development).

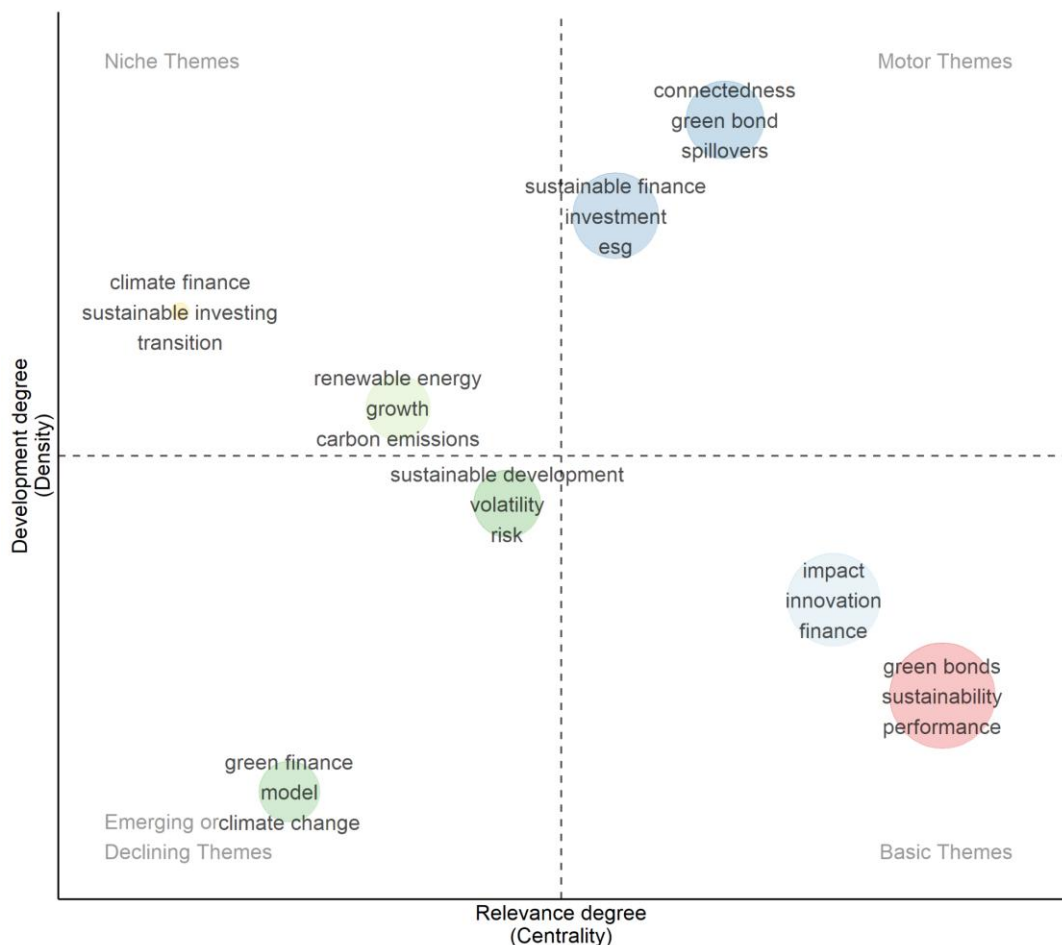


Figure 14. Strategic thematic structure of sustainable finance literature: centrality and density analysis of author keywords

The *Motor Themes* quadrant (upper-right) contains the most developed and influential topics in the field. The cluster centred on *sustainable finance*, *investment*, and *ESG* occupies a prominent position, indicating that these concepts constitute the

intellectual core of contemporary research. Closely related themes such as *green bonds*, *connectedness*, and *spillovers* exhibit high centrality and density, suggesting that studies increasingly focus on the transmission mechanisms, market interactions, and financial implications of sustainable investment instruments. The presence of these themes confirms the dominant role of environmental and financial considerations identified in the previous conceptual structure and keyword analyses.

The *Basic Themes* quadrant (lower-right) includes highly relevant but less internally developed topics. The largest cluster is composed of *green bonds*, *sustainability*, and *performance*, highlighting a substantial body of literature examining the relationship between sustainability practices and financial outcomes. Similarly, the cluster linking *finance*, *innovation*, and *impact* reflects growing interest in sustainable financial innovation and its contribution to environmental and socio-economic objectives. Their strategic location suggests that these themes serve as foundational pillars of the field and continue to attract significant scholarly attention.

The *Niche Themes* quadrant (upper-left) encompasses specialized but well-developed topics that remain relatively isolated from the broader research agenda. Themes such as *climate finance*, *sustainable investing*, and *transition* fall within this category, indicating the existence of mature yet specialized streams of inquiry. Although these topics demonstrate strong internal coherence, their lower centrality suggests a more limited integration with the wider sustainable finance literature.

The *Emerging or Declining Themes* quadrant (lower-left) includes topics characterized by relatively low centrality and density. The cluster comprising *green finance*, *climate change*, and *model* may represent either emerging areas with future growth potential or themes whose prominence is gradually diminishing. Given the rapid expansion of climate-related financial research observed in recent years, these topics are more likely to reflect emerging directions rather than declining ones. Their position suggests ongoing conceptual development and opportunities for future investigation.

Between the quadrants lies an intermediate cluster associated with *sustainable development*, *risk*, *volatility*, *renewable energy*, *carbon emissions*, and *growth*. Positioned near the centre of the map, these themes act as connecting elements between environmental sustainability and financial performance, linking the broader sustainability agenda with financial market dynamics and risk management considerations.

5. Discussions

The findings of this systematic literature review provide strong empirical support for the conceptual framework proposed in Section 2.7, which conceptualizes sustainable finance as a multidimensional construct encompassing environmental, social, governance, economic, institutional-regulatory, and innovation-related dimensions. The bibliometric and conceptual analyses reveal that these dimensions are not isolated components but rather interconnected elements that collectively influence the evolution of sustainable finance research. At the same time, the results confirm that the field has moved beyond a narrow ESG perspective toward a broader and more integrated understanding of the role of finance in supporting sustainability transitions, consistent with recent theoretical developments in the literature (Zaporozhets et al., 2026; Hassan et al., 2025).

A first important finding concerns the remarkable growth trajectory of the field. The publication surge observed after 2020 and the life-cycle analysis indicate that sustainable finance has entered a phase of rapid consolidation and scientific maturity. This evolution reflects the transformation described in the literature review, where sustainable finance evolved from socially responsible investment and ethical finance toward a comprehensive framework integrating ESG considerations, climate action, sustainable development, and financial performance (Schoenmaker, 2017; Schoenmaker & Schramade, 2019; Kumar et al., 2022; Kashi & Shah, 2023). The timing of this expansion coincides with increasing regulatory attention, the implementation of sustainable finance taxonomies, the acceleration of climate-related policies, and growing investor demand for sustainable assets (Ehlers et al., 2021; Jenei et al., 2024).

The geographical distribution of scientific production further reinforces this interpretation. China emerged as the dominant contributor, followed by India, Italy, the United Kingdom, and the United States. This pattern reflects the growing influence of Asian economies in developing sustainable finance research and practice. The prominence of China is particularly consistent with recent studies emphasizing the country's leading role in green finance, green bond markets, climate-related investment policies, and sustainable financial innovation (Gao et al., 2024; Xie, 2024; Zhou & Alnafrah, 2025). Moreover, the extensive international collaboration networks identified in the analysis suggest that sustainable finance has evolved into a genuinely global research agenda driven by transnational challenges such as climate change, energy transition, and sustainable development. These findings support the institutional perspective outlined in the literature review, which emphasizes the importance of regulatory systems, policy coordination, and international governance frameworks in shaping sustainable finance practices (Ülgen, 2024; Joo et al., 2026).

The author productivity analysis reveals that the intellectual development of the field has been driven by a relatively concentrated group of scholars, including Wang Y., Naeem M.A., Zhang Y., Tiwari A.K., and Wang X. Their prominence reflects the increasing specialization of research on green finance, sustainable investment, financial connectedness, climate finance, and ESG-related market dynamics. The concentration of publications among a core group of researchers is characteristic of rapidly expanding scientific domains and is consistent with previous bibliometric studies that identified a limited number of influential scholars impacting the intellectual foundations of sustainable finance (Zhang et al., 2019; Luo et al., 2022; Singhania et al., 2024). Importantly, the collaboration networks indicate that knowledge production increasingly occurs through international research partnerships rather than isolated national communities, further accelerating the diffusion of ideas and methodological approaches.

The conceptual structure analyses provide perhaps the strongest validation of the framework proposed in Section 2.7. The keyword co-occurrence network, abstract bigram network, and MCA conceptual map consistently identify three major thematic pillars: green and climate finance, sustainable development and economic outcomes, and ESG-governance-related research. These results largely confirm the multidimensional perspective advanced in the literature review, where sustainable finance was described as

extending beyond traditional ESG frameworks to incorporate economic, institutional, technological, and innovation-related dimensions.

The environmental dimension clearly dominates the intellectual landscape. Concepts such as green finance, green bonds, climate finance, climate change, renewable energy, and sustainable development occupy the most central positions across all conceptual analyses. This finding aligns with recent studies arguing that environmental and climate-related issues have become the primary drivers of sustainable finance research (Carè & Weber, 2023; Flammer, 2026; Sachdeva et al., 2026). The central role of green bonds is particularly noteworthy, confirming previous observations that these instruments have become one of the most widely studied mechanisms for mobilizing capital toward sustainability objectives (Laborda & Sánchez-Guerra, 2021; Thompson, 2023). The prominence of climate finance and climate change also reflects growing concerns regarding climate risks, financial resilience, and the financing of low-carbon transitions (Monasterolo & de Angelis, 2020; Zhai et al., 2024; Ahmad et al., 2026).

The governance and social dimensions are also visible but occupy a comparatively less dominant position. Themes related to ESG, corporate social responsibility, governance, sustainability performance, and stakeholder engagement form a distinct cluster within the conceptual structure. This result is consistent with the literature identifying ESG as the dominant operational framework of sustainable finance (Edmans & Kacperczyk), while simultaneously confirming critiques that ESG alone does not fully capture the complexity of sustainability challenges (Arslan et al., 2025; Hughes et al., 2021). The relatively peripheral position of social and governance themes suggests that, despite their recognized importance, environmental considerations continue to receive greater scholarly attention than social equity, inclusion, labor issues, or governance quality.

The analysis also provides evidence supporting the emergence of additional dimensions proposed in the conceptual framework. Concepts such as financial development, financial institutions, innovation, fintech, sustainable development goals, and economic growth indicate that sustainable finance increasingly incorporates economic, institutional, and technological perspectives. This finding corroborates recent arguments that sustainable finance should be viewed as a broader ecosystem involving regulatory frameworks, financial innovation, digital transformation, and sustainability-oriented market mechanisms (Khan et al., 2026; Hassan et al., 2026; Yang et al., 2026). The growing visibility of digital finance, innovation, and sustainable financial instruments suggests that technological transformation is becoming an increasingly important driver of sustainability transitions.

Another significant finding concerns the presence of a highly connected cluster centred on future research, research gaps, research directions, and systematic reviews. This cluster occupies a central position within the conceptual map, indicating that a substantial proportion of the literature is focused not only on empirical applications but also on conceptual refinement and theory building. This observation directly confirms the research gap identified in Section 2.6, namely the absence of a unified framework capable of integrating the multiple dimensions of sustainable finance. The persistence of research-gap-related themes suggests that the field remains theoretically fragmented despite its rapid growth. As noted by Migliorelli (2021), Cunha et al. (2021), Ozili (2021), and Jamali

and Voghouei (2026), the lack of conceptual consensus continues to represent one of the principal challenges facing sustainable finance scholarship.

Finally, the thematic analysis indicates that sustainable finance research is simultaneously consolidating around mature themes and expanding into new areas of inquiry. Green finance, ESG integration, sustainable investment, and green bonds now function as motor themes that drive the field's development. In contrast, climate finance, transition finance, biodiversity finance, digital finance, and resilience-oriented approaches appear as emerging or rapidly evolving themes. This pattern is consistent with recent studies highlighting the increasing diversification of sustainable finance research toward biodiversity protection, just transition frameworks, systemic resilience, and digital sustainability (Flammer et al., 2025; George et al., 2025; Hassan et al., 2026; Suárez-Giri et al., 2026).

The findings resulted from this systematic literature review not only validate the multidimensional framework proposed in this study but also suggest that future theoretical and empirical developments will increasingly depend on understanding the interactions among these dimensions rather than examining them in isolation.

6. Conclusions

This study provides a comprehensive synthesis of the sustainable finance literature through a systematic review of 241 articles published between 2007 and 2026. By combining bibliometric techniques with qualitative content analysis, the research contributes to a clearer understanding of how sustainable finance has evolved and how its principal dimensions are conceptualized across the academic literature.

The findings demonstrate that sustainable finance has developed into a mature and rapidly expanding research domain, characterized by a strong emphasis on environmental sustainability, particularly through themes such as green finance, green bonds, climate finance, and sustainable development. At the same time, the analysis confirms that the field extends beyond traditional ESG approaches, encompassing broader economic, institutional, regulatory, and innovation-related dimensions. The proposed conceptual framework contributes to the literature by integrating these dimensions into a coherent structure that highlights their interrelationships and collective influence on sustainable development, financial resilience, risk mitigation, and long-term value creation.

From a theoretical perspective, the study addresses an important gap identified in previous reviews by examining sustainable finance as a multidimensional construct rather than focusing on individual instruments or subdomains. The bibliometric analyses further reveal the intellectual structure of the field, identify its most influential contributors and research themes, and highlight the increasing internationalization of scientific collaboration.

Despite these contributions, several limitations should be acknowledged. First, the review is based exclusively on publications indexed in Web of Science, Scopus, and Google Scholar, which may have excluded relevant studies contained in other databases or in the grey literature. Second, the analysis focuses primarily on English-language publications, potentially limiting the representation of regional perspectives and non-English contributions. Third, bibliometric methods capture patterns of scientific production

and conceptual relationships but cannot fully assess the practical effectiveness of sustainable finance mechanisms in real-world contexts.

Future research should therefore move beyond descriptive and conceptual analyses toward empirical investigations assessing the effectiveness of sustainable finance instruments, ESG integration practices, and sustainability-related policies. Additional attention should also be devoted to underexplored areas identified in this review, including biodiversity finance, transition finance, digital and fintech-enabled sustainability solutions, social sustainability dimensions, and the role of sustainable finance in developing economies. Further comparative and interdisciplinary studies may contribute to strengthening theoretical integration and advancing a more comprehensive understanding of how financial systems can support long-term sustainability transitions.

To conclude, the findings confirm that sustainable finance has become a central pillar of contemporary sustainability research and practice. As environmental, social, and governance challenges continue to intensify, the development of integrated and multidimensional sustainable finance frameworks will remain essential for aligning financial systems with global sustainable development objectives.

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