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Artificial Intelligence in Green and Sustainable Investment: a Bibliometric and Systematic Literature Review

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Abstract

Green and sustainable investment has gained increasing global attention due to the urgency of the climate crisis, social demands, and the adoption of Environmental, Social, and Governance (ESG) principles. However, research on the application of artificial intelligence (AI) in this domain remains fragmented and lacks a comprehensive mapping. This study aims to map the trends, research directions, and key findings related to AI in green and sustainable investment using a bibliometric and systematic literature review (SLR) approach. Data were retrieved from the Scopus database and screened with the PRISMA framework, resulting in 24 articles analyzed through VOSviewer and thematic synthesis. The results indicate significant developments in energy efficiency, green buildings, machine learning, and sustainability, alongside an expanding pattern of international collaboration. Nonetheless, limitations remain, including insufficient cross-sectoral integration, limited empirical studies in developing countries, and the lack of AI models that holistically incorporate risk, ESG, and SDGs indicators. The main contribution of this study lies in providing a structured literature mapping that can serve as a foundation for developing more integrative AI frameworks and expanding research contexts to optimize sustainable green investment. These findings are expected to be valuable for researchers and practitioners in advancing innovation and strengthening the AI-driven sustainable finance ecosystem.

Keywords : *Artificial Intelligence, Bibliometric Analysis, Green Investment, Sustainable Investment, Systematic Literature Review*

1. INTRODUCTION

Sustainable investment now occupies a strategic position within the global financial ecosystem. This approach emphasizes not only the achievement of financial returns but also the social and environmental impacts generated, guided by Environmental, Social, and Governance (ESG) principles. As awareness of the climate crisis and social inequality increases, financial institutions and institutional investors are beginning to shift their portfolios toward more responsible and sustainable directions[1]. Globally, the Sustainable Development Goals (SDGs) initiative drives the transformation of funding and investment directions to align with long-term sustainability agendas. At the national level, Indonesia has also demonstrated its commitment through the implementation of the Sustainable Finance Roadmap by the Financial Services Authority (OJK), which regulates the participation of the banking sector, capital markets, and non-bank financial institutions in supporting green financing[2].

This transformation is further accelerated by advancements in digital technology, particularly artificial intelligence (AI), which is beginning to play a crucial role in investment decision-making processes[3]. Various methods, such as machine learning, deep learning, and adaptive algorithms like Long Short-Term Memory (LSTM) and Deep Reinforcement Learning (DRL), have been applied to model market dynamics, predict returns, manage risks, and optimize portfolios[4]. The integration of AI

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in financial practices not only enhances the efficiency and accuracy of data analysis but also opens opportunities to design financial systems that are more responsive to ESG and SDGs indicators[5].

Recent empirical studies also highlight that AI adoption can significantly improve corporate ESG performance, while ESG itself mediates the effect of AI on corporate sustainable development outcomes[6]. However, some evidence indicates that the rapid expansion of AI may at times divert resources away from long-term ESG projects, suggesting a dual-edged role of AI in sustainable finance[7]. To address these risks, responsibility frameworks that include legitimacy, transparency, and explainability have been emphasized as critical pillars for the responsible use of AI in finance[8].

Furthermore, methodological studies emphasize the importance of systematic literature review (SLR) and bibliometric analysis in identifying publication trends, scientific collaborations, and research gaps[9]. Through this approach, researchers can obtain a structured overview of the scientific landscape, thematic directions, and emerging contributions. Several recent bibliometric studies have specifically mapped the intersection of AI, ESG, and sustainable finance, confirming the surge in publications after 2015 and highlighting challenges such as data standardization, ethical implications, and methodological fragmentation[10][11][12][13]. In addition, methodological innovations, such as the use of large language models (LLMs) in systematic reviews, have shown promising results in replicating human-level classification in ESG-related literature[14].

However, despite the significant increase in scientific publications examining the application of AI in the context of sustainable investment, few studies have systematically mapped the development of the literature in this field. Most research remains scattered, fragmented, and focused on specific technical approaches without considering the overall knowledge landscape. Therefore, a comprehensive and structured review is needed to understand the research dynamics, scientific collaboration, and emerging thematic directions.

This study aims to address this need by conducting a bibliometric and systematic review of the literature related to the application of artificial intelligence in green and sustainable investment. The bibliometric approach is used to evaluate publication trends, collaboration networks among authors and institutions, as well as to visualize dominant keywords using VOSviewer software. Meanwhile, the systematic literature review (SLR) approach is applied to analyze in depth the main findings, methodologies used, and identify research gaps from the selected articles. Thus, this study is expected to provide a comprehensive overview of the status, directions, and research opportunities in the field of AI-driven sustainable finance, as well as to encourage more focused academic and practical contributions in the future.

2. METHOD

This study adopts a combined approach of quantitative bibliometric analysis and systematic literature review (SLR) to analyze scientific publications on the integration of artificial intelligence (AI) in green and sustainable investment. The bibliometric approach is used to map the knowledge structure based on publication metadata, including keywords, authors, institutional affiliations, countries of origin, and journal sources. This method is effective in identifying patterns of scientific collaboration, the distribution of dominant topics, and in revealing research gaps that have been underexplored[15]. Meanwhile, the SLR approach is applied to systematically examine the content of selected articles to uncover the main findings, methodologies employed, and contributions to AI-based green investment practices.

Research Questions (RQ) To guide the review, the following research questions were formulated:

- RQ1: What are the publication trends and thematic directions in the application of AI for green and sustainable investment?

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- RQ2: What are the collaboration patterns among authors, institutions, and countries in this domain?
- RQ3: What methodologies and findings dominate the literature, and what research gaps and opportunities for future research can be identified?

The data were retrieved from the Scopus database, which was selected for its comprehensive multidisciplinary coverage and compatibility with bibliometric tools such as VOSviewer and Bibliometrix. Although Scopus served as the primary source, future studies may complement it with other reputable databases (e.g., Web of Science, IEEE Xplore, SpringerLink) or apply snowballing techniques to capture additional relevant works.

Data collection was conducted in July 2025 using Boolean operators in the TITLE-ABS-KEY fields. The query was designed to capture relevant articles as follows: TITLE (sustainable OR green AND investment OR green AND finance OR artificial AND intelligence) AND (LIMIT-TO (SUBJAREA , "COMP")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (LANGUAGE , "English")). All bibliographic records were exported in CSV and RIS formats. Duplicate entries were removed using Microsoft Excel, and metadata were cleaned by standardizing author names and merging synonymous keywords (e.g., “AI” and “Artificial Intelligence”). Only journal articles with full-text access were retained.

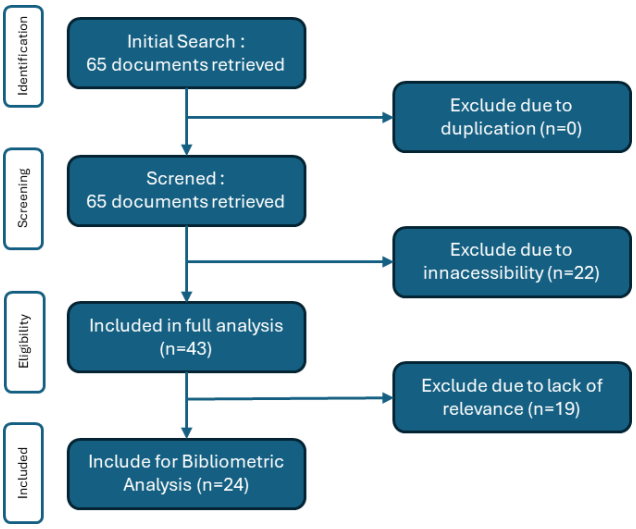

Figure 1. PRISMA Flow

After preprocessing, article screening followed the PRISMA 2020 framework (Figure 1). From the 65 initial documents, 22 were excluded due to a lack of full access, and 19 were excluded during content screening for irrelevance (e.g., no AI application in sustainable investment or conceptual/editorial papers). A final set of 24 articles was included. Inclusion criteria: (i) empirical or methodological studies applying AI to green/sustainable investment, (ii) published in peer-reviewed journals, (iii) written in English. Exclusion criteria: reviews, purely conceptual papers, or articles without a measurable AI application.

Bibliometric analysis was conducted using VOSviewer (version 1.6.20) to map keyword co-occurrence, co-authorship, and co-citation networks. Minimum occurrence thresholds were set at ≥2 for keywords and ≥1 for authors/institutions. Visualization outputs included network maps and overlay visualizations, which provided insights into thematic clusters, temporal trends, and structural

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relationships within the literature. Descriptive analyses related to publication trends, geographic distribution, and author productivity were performed using Microsoft Excel.

The SLR procedure also followed PRISMA stages: identification, screening, eligibility, and inclusion. The selected 24 articles were systematically coded by research objectives, methods, AI techniques, and contextual domains (e.g., energy, green finance, ESG scoring). A thematic synthesis was then conducted to identify dominant approaches, methodological patterns, and research gaps.

The overall research process, encompassing the formulation of research objectives and search strategy, through to the synthesis of results and drawing of conclusions, is illustrated in Figure 2. It covers five stages: (1) formulation of research objectives and search strategy, (2) data collection and initial screening, (3) data preprocessing and PRISMA-based screening, (4) bibliometric and thematic analyses, and (5) synthesis of results and visualization. This structured process ensures transparency, replicability, and reliability in mapping the scientific landscape of AI in green and sustainable investment.

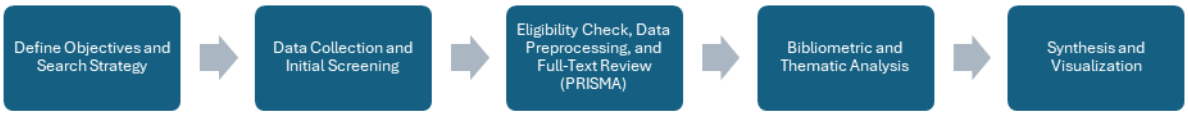

Figure 2. Research Method

Figure 2 shows the research methodology flow, which comprises five main stages, ranging from determining objectives and developing literature search strategies to synthesizing results and visualizing findings. Each stage is systematically arranged to ensure accuracy and traceability in the bibliometric review and systematic literature review processes. This flow includes query formulation and data collection from the Scopus database, article screening based on inclusion and exclusion criteria (PRISMA), as well as bibliometric and thematic analyses. Bibliometric analysis is conducted with the assistance of VOSviewer software to map keyword networks (co-occurrence), author and institution collaborations (co-authorship), and thematic visualizations through overlay and density views[16]. Meanwhile, descriptive analyses related to publication trends, geographic distribution, and author productivity are performed using Microsoft Excel. With this approach, the study is expected to comprehensively map the scientific landscape surrounding the application of artificial intelligence in the context of green investment and sustainable finance[15].

3. RESULT

This section presents the results of the bibliometric and SLR analyses objectively, including publication trends, citation distributions, productive countries, publisher distribution, and thematic keyword clusters. Each finding is described step by step to ensure transparency and reproducibility.

3.1. Descriptive information

The literature analyzed in this study consists of 24 scientific journal articles discussing the application of artificial intelligence in the context of green and sustainable investment. These articles were published between 2018 and 2025, with the majority of publications occurring after 2021. This indicates that the topic of AI integration in sustainable finance is a relatively new but rapidly growing research area over the past five years.

All the articles analyzed are written in English and published by reputable journals in the fields of finance, information technology, computer science, and environmental studies. The majority of the

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documents originate from Asian and European countries such as China, India, South Korea, Turkey, Vietnam, Malaysia, as well as several European countries, including Spain, Poland, Romania, Serbia, Croatia, Portugal, and the United Kingdom. Author collaborations also involve other countries such as Australia, Ethiopia, Saudi Arabia, Singapore, and the United States, although China and other Asian countries dominate the largest contributions.

Some of the most frequently cited journals in this analysis include Sustainability, Journal of Cleaner Production, and Environmental Science and Pollution Research. In terms of topics, the variety of keywords that emerged indicates a connection between themes such as AI, sustainable finance, ESG investing, and technical approaches like machine learning, deep learning, and reinforcement learning. The distribution of documents and topic variations serves as the primary basis for the bibliometric and systematic analyses conducted in the subsequent stages.

3.2 Publication growth

The growth in the number of publications on the topics of green investment and artificial intelligence shows an increasing trend over the past five years. To identify the dynamics of literature development over time, an analysis of publication counts by year was conducted. Figure 1 presents the visualization of the growth trend in the number of documents from 2018 to mid-2025, based on the selection of relevant articles in this study.

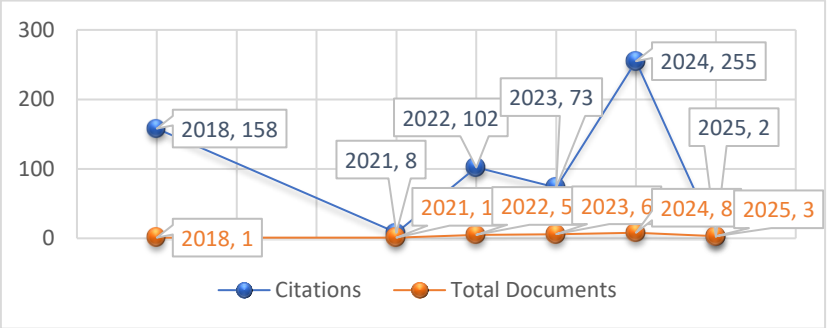

Figure 3. Distribution of total documents and citations

Figure 3 shows that scientific publications on this topic first appeared in 2018 with one document and remained stagnant until 2020. Starting in 2021, the growth trend began to increase gradually, with 1 document in 2021, 5 documents in 2022, and 6 documents in 2023. The peak productivity occurred in 2024, with 8 documents published, making it the most productive year during the observation period. In 2025 (up to mid-year in July), 3 documents have been published, and this number is likely to increase over time as the publication process in scientific journals continues.

This publication's growth trend reflects the increasing interest from academics and practitioners in integrating artificial intelligence in sustainable investment. Topics such as AI for ESG scoring, green portfolio optimization, carbon footprint tracking, and green fintech are becoming increasingly relevant in line with global efforts to achieve net-zero emissions and the Sustainable Development Goals (SDGs). In addition to observing the publication trend in Figure 3, the bibliometric analysis also considers the distribution of citations per year as an indicator of the influence and acceptance level of the articles within the scientific community.

Based on Table 1, the distribution of citation counts per year for the analyzed documents shows significant fluctuations throughout the period from 2018 to 2025. The publication from 2018, despite being only a single document, received the second highest number of citations, totaling 158, indicating that this article has had a substantial impact and influence as an early reference in the field of AI

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integration in sustainable investment. In 2021, the citation count was relatively low (8 citations), consistent with the limited number of documents published that year.

The increase in publication volume since 2022 was accompanied by a surge in citations, with articles published in 2022 and 2023 receiving 102 and 73 citations, respectively. The most significant surge occurred in 2024, with a total of 255 citations, making it the year with the highest citation contribution during the observation period. Meanwhile, the citation count for 2025 remains very low (2 citations), which is understandable given that citation accumulation takes time and articles published in the current year are typically not yet widely cited by other publications.

This trend confirms that publications in recent years have not only increased in quantity but also begun to demonstrate significant influence in the advancement of knowledge related to AI and green investment. Earlier published articles have had more time to accumulate citations, whereas more recent publications are still in the process of citation accumulation.

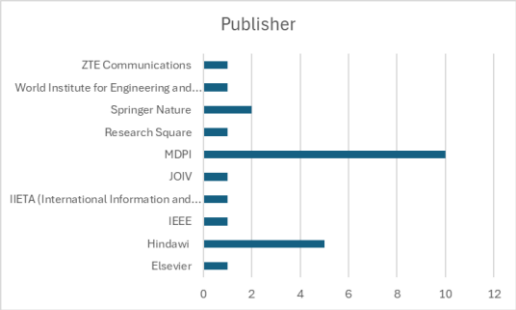

Figure 4. Publisher Distribution

Figure 4 shows the distribution of articles analyzed in this study, reflecting the diversity of international scientific publishers overseeing publications related to the integration of artificial intelligence in green and sustainable investment. Of the 26 documents identified as relevant, the majority were published by MDPI, with a total of 10 articles, followed by Hindawi with 5 articles, and Springer Nature with 2 articles. Meanwhile, several other prominent publishers such as Elsevier, IEEE, IIETA (International Information and Engineering Technology Association), JOIV (International Journal on Informatics Visualization), Research Square, World Institute for Engineering and Technology Education (WIETE), and ZTE Communications each contributed one document.

This diversity of publishers not only reflects the quality and credibility of the reference sources used but also indicates that the issue of artificial intelligence integration in green investment has attracted widespread attention across various reputable international scientific forums. The dominance of publishers such as MDPI and Hindawi also demonstrates that this topic is highly exposed in open-access journals, facilitating the dissemination of knowledge and access for both the global academic community and practitioners.

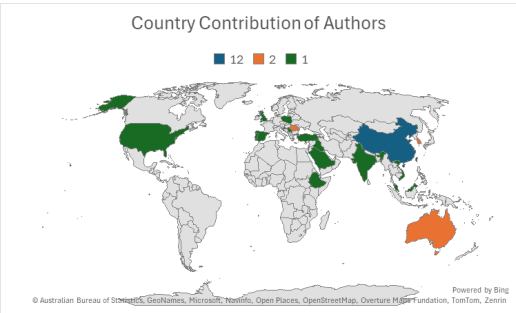

Figure 5. Distribution of Publications by Country of Author

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The distribution of author countries involved in publications on Artificial Intelligence in Green and Sustainable Investment can be seen in Figure 5. The analysis shows that China dominates contributions with a total of 12 documents, highlighting the country's central role in the global development of AI research in the green investment sector. Other countries with significant contributions include Australia (2 publications), South Korea (2), and Romania (2). Meanwhile, several countries such as Singapore, Taiwan, the United States, India, Ethiopia, Saudi Arabia, Iraq, the UK, Spain, Vietnam, Poland, Serbia, Croatia, Malaysia, Turkey, and Portugal each contributed one publication.

This distribution of author country contributions indicates a fairly extensive international collaboration network in this field. However, research centralization still occurs in several key countries such as China, South Korea, Romania, and Australia. The high contributions from Asian and European countries further reinforce previous findings that these regions are very active in promoting the application of artificial intelligence in sustainable finance. This analysis is important for understanding the pattern of knowledge distribution and the potential for cross-country research networks on the topic of AI and green investment.

3.3 Thematic Trends of Publications

Thematic trends emerging in research related to artificial intelligence in green and sustainable investment are analyzed based on the visualization of author keyword networks to identify main themes, interconnections among topics, and the dynamics of research development in this field. By understanding the emerging thematic patterns, this study can map research focus areas, shifts in trends, and opportunities for multidisciplinary collaboration in the topic of AI-based green investment.

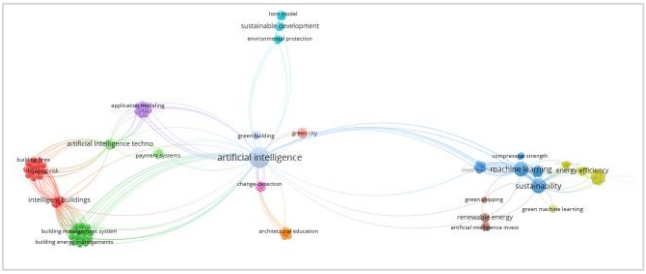

Figure 6. Co-occurrence Networks of Research Themes Based on Author Keywords

Figure 6 shows the network of interconnected main research themes based on the most frequently used author keywords in publications on artificial intelligence in green and sustainable investment. The visualization reveals that "artificial intelligence" serves as the central theme linking a variety of topics, ranging from green and smart buildings, machine learning, to renewable energy and energy efficiency. The largest cluster centers on the application of artificial intelligence for optimizing smart building systems, risk mitigation, such as fire prevention, and environmentally friendly building energy management. Additionally, there is a strong tendency to utilize machine learning and deep learning to improve energy efficiency, optimize investments in the renewable energy sector, and support the achievement of sustainability goals and green city development.

Other themes that are also beginning to develop include application modeling, payment systems, and architectural education, although these remain minor research areas compared to the main clusters. The pattern of interconnections among keywords in this network reveals an increasingly collaborative and multidisciplinary research trend, with a tendency toward integration between artificial intelligence technologies, sustainable resource management, and green investment decision-making. Overall, this

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network visualization confirms the central role of artificial intelligence in driving cross-sector innovation to realize increasingly green and sustainable investment and development systems.

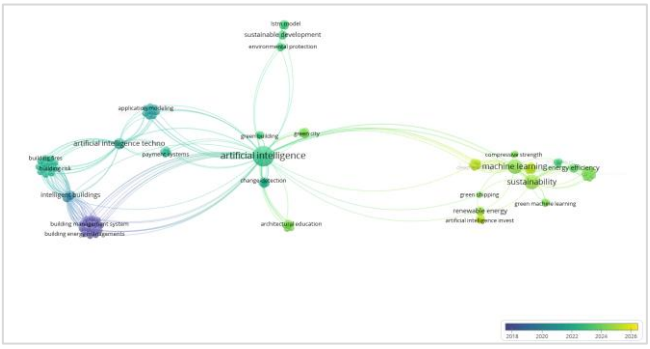

Figure 7. Overlay of Author Keyword Co-Occurrence

The overlay visualization in Figure 7 shows the temporal evolution of research themes in the field of artificial intelligence in green and sustainable investment based on author keywords. The colors ranging from dark blue to yellowish green represent the emergence of topics from 2018 to 2025, with the color gradient visually indicating the chronological order of publication. From this figure, it can be observed that early research in this field was dominated by themes such as "intelligent buildings," "building management system," and "building energy management," which appear in publications colored dark blue to light blue (approximately the 2018–2020 period).

Over time, the research focus began to shift toward themes like "artificial intelligence," "green building," and "sustainable development," shown in green, indicating the expanding application of AI for sustainable development and environmental protection in the following years. In the more recent period (2022–2025), topics such as "machine learning," "energy efficiency," "sustainability," and "renewable energy" appear increasingly dominant and are colored yellow-green, signaling growing research interest in energy efficiency and renewable energy development supported by AI and machine learning.

This overlay trend also indicates a thematic shift from AI applications in risk management and smart building systems toward the integration of machine learning and predictive models to support green investment, sustainability decision-making, and more efficient and environmentally friendly energy transition strategies. This visualization confirms that, over time, research direction has become increasingly focused on the contribution of AI and machine learning in supporting sustainability and strengthening the global green investment ecosystem.

4 DISCUSSIONS

While the previous section objectively presented the results of publication trends, thematic clusters, and country distributions, this discussion section aims to interpret these findings, explain their significance, and relate them to existing studies and future research directions.

4.2 Interpretation of Key Findings

The bibliometric results reveal several key patterns in the evolution of AI in sustainable investment. The dominance of China and other Asian countries (Figure 5) reflects the region's strong commitment to renewable energy and technological innovation. This aligns with recent findings indicating that AI adoption significantly enhances corporate ESG performance, particularly through increased green innovation and resource optimization[17]. The rapid increase in publications since 2021 (Figure 3) suggests that this research domain has become increasingly urgent, particularly as AI

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applications transition from conceptual discussions to empirical implementations across various sectors. This aligns with the global focus on sustainability and the SDGs, positioning AI as a central tool in green investment[18].

Meanwhile, the thematic shift from "intelligent buildings" to "machine learning" and "renewable energy" (Figure 7) indicates that the research focus is evolving in tandem with the global energy transition. This trend aligns with the concept of green AI, which underscores the importance of developing AI systems that minimize environmental impact while supporting sustainable development [19]. Finally, the strong role of open-access publishers such as MDPI and Hindawi (Figure 4) underscores the effort to make sustainability-related AI research widely accessible to both academia and industry. Together, these findings confirm that the field is transitioning from a niche research area into a globally significant knowledge domain, with AI positioned as a central driver for ESG and SDGs oriented investments.

4.3 Comparison with Literature and Scientific Contribution

The findings of this study confirm several global patterns previously reported in bibliometric and systematic reviews of AI in green and sustainable investment. For example, the dominance of China and other Asian countries in publication output (Figure 5) is consistent with Davidescu *et al*. [10] and Vuković *et al*.[12]. The rapid growth of publications since 2021 (Figure 3) also aligns with Roy and Vasa[13], while the thematic shift from intelligent buildings to machine learning and renewable energy (Figures 6–7) resonates with Elhady and Shohieb[11]. Moreover, our findings reinforce the concept of Green AI (Bolón-Canedo[19]) as a new research orientation. To strengthen this analysis, Table 1 presents a comparison between prior literature and the findings of this study, highlighting both consistencies and contributions.

Table 1. Comparison Between Prior Literature and This Study

Aspect	Prior literature (selected studies)	This study (24-article corpus)	Contribution
Publication growth	Surge in AI–ESG research post-2015; accelerated 2021–2024 [10]–[13]	Peak in 2024; continuous growth 2018–mid-2025	Updates the trend with the latest coverage
Regional leadership	Asia/China leading role [10], [12]	China dominates (12 docs), strong collaboration networks	Provides detailed mapping of author countries
Thematic evolution	Diversification across ESG & finance [11], [19]	Shift from "buildings" → "ML, renewable energy, sustainability"	Validates thematic shift with VOSviewer overlay
Open access	OA accelerates dissemination [10], [13]	MDPI & Hindawi dominate publishers	Evidence of OA's role in spreading research
ESG performance	AI ↗ ESG performance, but possible trade-offs [6], [7]	Consistent with ESG improvement via AI (see 4.2)	Links bibliometric findings to ESG outcomes
Research gaps	Data standards, ethics, fragmentation [10]–[13]	Lack of integrative models, limited developing-country studies, and few longitudinal works	Clearer agenda for future AI-sustainability research

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In summary, this study contributes by (i) providing an updated mapping of AI in green and sustainable investment (2018–mid-2025), (ii) validating thematic evolution with bibliometric visualization, and (iii) identifying precise research gaps, thereby enriching the academic discourse and offering guidance for future inquiry.

4.4 Research Gap and Future Directions

Research on AI in green and sustainable investment has shown rapid progress, with notable applications across various sectors, including energy efficiency, green buildings, logistics, and urban environmental management. However, the bibliometric and SLR analysis of the 24 selected articles also reveals persistent gaps that remain underexplored. Addressing these gaps requires more comprehensive and integrative approaches, which form the foundation for developing future research directions. Several studies highlight the role of IoT, sensors, machine learning, and deep neural networks in maximizing energy efficiency, safety, and fire risk management in green smart buildings[20][21]. Similar innovations have been applied to the design and management of urban infrastructure and green spaces[22],[23]. In the field of environmental design, AI has been shown to accelerate eco-friendly design processes and improve the efficient use of resources and energy [24]–[25].

Other studies emphasize green finance, supply chain management, and the optimization of sustainable investments. AI models such as neural networks and IPSO-BPNN have proven effective in analyzing green projects and optimizing environmentally friendly supply chain management [26], [27]. In logistics and transportation, AI contributes to green route planning and operational efficiency [28], [29]. In addition, AI has been widely applied in renewable energy and green AI development, contributing to carbon emission reductions and cross-sector environmental technologies [30]–[19].

Table 2. Research Gaps and Future Directions

No	Research Gap	Future Research Directions
1	Overemphasis on energy, green buildings, and urban infrastructure	Broaden AI applications beyond these sectors
2	Lack of integrative cross-sector AI models	Develop adaptive AI frameworks linking finance, energy, logistics, and environment
3	Limited empirical and longitudinal studies in developing countries	Conduct long-term and regional comparative research
4	Absence of comprehensive AI–ESG–SDGs frameworks	Build holistic models integrating risk, ESG, and SDGs indicators
5	Underexplored agriculture-based green investment	Advanced AI models for ESG-based agri-finance, commodity price prediction, and agricultural risk management
6	Underexplored sustainable financial assets	Apply AI for risk prediction, portfolio optimization, and volatility analysis in gold, ESG indices, and green bonds
7	Data quality and ethical transparency challenges	Establish explainable and responsible AI frameworks

Nevertheless, the analysis of the 24 included articles shows that several gaps remain prominent. First, there is a lack of integrative cross-sector AI models that combine finance, energy, logistics, and environmental domains. Second, empirical and longitudinal studies remain limited, particularly in developing countries where sustainability challenges are more complex. Third, there remains a lack of comprehensive AI frameworks that integrate risk, ESG, and SDGs considerations into sustainable

investment decision-making. These findings underscore the need for more extensive and adaptable approaches to advance AI-driven sustainable investment research.

To provide a structured overview, Table 2 summarizes the identified gaps. In addition to gaps directly observed in the corpus, it also indicates unaddressed areas, such as agriculture-based green investment and sustainable financial assets, which were absent from the included studies but represent critical future directions.

Overall, the identified gaps highlight the importance of expanding sectoral coverage, developing cross-sectoral frameworks, and enhancing the empirical and ethical foundations of AI-driven green and sustainable investment. By addressing these challenges, future research will be able to contribute more effectively to both academic development and practical applications in green and sustainable investment.

5 CONCLUSION

This study has mapped the trends, developments, and main themes in research on artificial intelligence (AI) in green and sustainable investment through bibliometric and systematic literature review approaches. The analysis shows an increase in publications with dominant themes related to energy efficiency, green buildings, machine learning, and sustainability. Nonetheless, research gaps remain, such as limited cross-sector integration, scarce empirical studies in developing countries, and a lack of development of integrated AI models that consider risk and sustainability indicators. Future research is recommended to develop more comprehensive AI frameworks, broaden the scope of study contexts, and enhance interdisciplinary collaboration to support sustainable green investment. The findings of this review are expected to serve as a reference for the development of innovation and policy in the field of AI-based green investment in the future. In addition, this study contributes to the advancement of computer science by demonstrating how bibliometric and systematic approaches can be applied to map AI-driven research landscapes, offering methodological insights for informatics scholars and strengthening the role of AI as a key enabler in sustainable development.

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