

margin eco daf jun 26

by Cek Turnitin

Submission date: 14-Jun-2026 05:51PM (UTC+0900)

Submission ID: 2979680377

File name: margin_eco_daf_jun_26.docx (5.72M)

Word count: 9843

Character count: 65413



Greenwashing, ESG Fraud, and Forensic Accounting: Mapping the Intellectual Structure of Sustainability Misconduct Research

Article	Abstract
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belum berkembang terkait dengan akuntansi forensik. Temuan menunjukkan pertumbuhan pesat dalam penelitian pelanggaran keberlanjutan, terutama dalam beberapa tahun terakhir, dengan greenwashing sebagai pusat konseptual yang dominan. Tiga kluster tematik utama teridentifikasi. Yang pertama menghubungkan greenwashing dengan keberlanjutan, tanggung jawab sosial perusahaan, pengungkapan, dan penelitian yang berorientasi pada legitimasi. Yang kedua berpusat pada greenwashing korporat, Tiongkok, ekonomi hijau, manajemen lingkungan, dan keberlanjutan korporat, yang mencerminkan aliran yang berorientasi pada kebijakan dan tata kelola. Yang ketiga menghubungkan greenwashing ESG dengan inovasi hijau, asimetri informasi, keuangan, kinerja ESG, dan tata kelola, yang menunjukkan pergeseran ke arah kredibilitas ESG dan akuntabilitas berbasis pasar. Terlepas dari perkembangan ini, akuntansi forensik tetap kurang terlihat dalam struktur tematik. Hal ini menunjukkan bahwa deteksi penipuan, prosedur investigasi, bukti audit, dan jaminan forensik masih belum berkembang secara memadai dalam penelitian mengenai pelanggaran keberlanjutan. Studi ini terbatas pada publikasi yang terindeks di Scopus dan kualitas metadata bibliometrik. Tinjauan ini memberikan kontribusi dengan mengintegrasikan greenwashing, penipuan ESG, dan akuntansi forensik ke dalam satu peta bibliometrik, serta dengan menempatkan akuntansi forensik sebagai arah penting di masa depan bagi penelitian akuntabilitas keberlanjutan.

Kata kunci: *Greenwashing*; Penipuan ESG; Akuntansi Forensik; Analisis Bibliometrik; Keberlanjutan.

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INTRODUCTION

Studies consistently associate the quality and content of ESG disclosures with perceptions of credibility and fraud risk. Higher-quality CSR/ESG disclosures and robust governance disclosures are linked to lower fraud risk and reputational penalties upon misconduct, while gaps in forward-looking or verifiable disclosures are flagged as indicators of greenwashing and potential misconduct (Carè & Fatima, 2024; Ellili & Seow, 2025; Tarjo et al., 2024; Saji & Akshaykumar, 2025; Peng, 2025). This cluster is reinforced by bibliometric syntheses identifying ESG disclosure quality as a core topic in ESG-related research and a central driver of market perceptions and risk assessments (Carè & Fatima, 2024; Seow, 2025; Cao et al., 2024; Jain & Tripathi, 2023).

Greenwashing emerges as a specific form of disclosure misrepresentation that interacts with governance signals and market reactions. Systematic reviews and bibliometric mappings consistently identify greenwashing as a persistent problem in sustainability reporting and note its regulatory and practical implications for auditors, regulators, and investors (Pendse et al., 2022; Peng, 2025; Moodaley & Telukdarie, 2023; Jain & Tripathi, 2023). Some analyses emphasize the gap between historical disclosures and forward-looking commitments (net zero, product end-of-life claims) as particularly vulnerable to misrepresentation (Peng, 2025). Unmasking greenwashing as a phenomenon involves understanding the roles of media, whistleblowers, and information environments. Recent studies emphasize the media's role in highlighting greenwashing and the importance of whistleblowers in catalyzing accountability, suggesting a need for more research on information channels and communication ecosystems that reveal misconduct (Cinceoglu & Strauß, 2024; Moodaley & Telukdarie, 2023). Although multiple theories underpin ESG and sustainability misconduct research, there is limited consensus on a unified theoretical framework. Reviews argue for broader integrative theories and cross-disciplinary perspectives to capture the complexity of sustainability misconduct, including the interplay between regulation, market incentives, and organizational governance (Ellili & Seow, 2025; Zheng, 2025; In et al., 2023).

ESG disclosure quality is linked to fraud risk and reputation effects; higher-quality disclosures correlate with lower fraud likelihood in some studies, while greenwashing signals emerge when disclosures misrepresent genuine ESG performance (Carè & Fatima, 2024; Ellili & Seow, 2025). Forward-looking disclosures (net-zero commitments, end-of-life claims) are frequently cited as high-risk areas for misrepresentation (Peng, 2025). The literature emphasizes the need to evaluate ESG quality through systematic reviews and bibliometric analyses to map disclosure practices and their implications (Stelios & Lemonakis, 2023; Su et al., 2025; Pendse et al., 2022; Moodaley & Telukdarie, 2023). ESG fraud is linked to governance, pressures, and data manipulation; the pandemic and regulatory shifts intensified interest in ESG fraud research, with suggested future work on fraud risk under sustainability pressures and data reliability (Tarjo et al., 2024; Zheng, 2025). Evidence suggests assurance practices address historical disclosures but gaps exist for forward-looking sustainability commitments, underscoring the need for improved audit standards (Peng, 2025). Reviews highlight the role of governance features like board independence in addressing ESG controversies (Ellili & Seow, 2025). Forensic accounting and assurance are repeatedly proposed as defenses, with calls to expand the scope of assurance to cover forward-looking sustainability issues and to develop integrated frameworks linking ESG practices, risk management, and financial performance (Ellili & Seow, 2025; Wu, 2025; Peng, 2025; Jain & Tripathi, 2023). The literature also notes the need for methodological rigor in mapping the intellectual structure of sustainability misconduct and linking it to practical governance measures (Phore, 2025; Thomas et al., 2024).

ESG fraud and sustainability misconduct are framed as evolving phenomena influenced by external pressures (e.g., pandemic, regulatory tightening) and internal incentives (fraud triangle dynamics). Bibliometric mappings identify ESG fraud as an emergent area with identifiable patterns in schemes, fraud triangles, and data manipulation practices, and call for greater attention to the cross-border and sector-specific heterogeneity of misconduct risks (Tarjo et al., 2024). Several reviews stress that ESG scores or disclosures alone do not guarantee integrity; greenwashing risk persists when ESG data are used to signal legitimacy without corresponding substantive performance (Carè & Fatima, 2024; Tarjo et al., 2024; Zheng, 2025). The literature

connects ESG performance and misrepresentation to regulatory oversight, market penalties, and investor decision-making. Reviews emphasize that ESG-related misrepresentation can distort investment, affect credit and equity markets, and necessitate stronger audit and assurance regimes as well as standardized metrics (Carè & Fatima, 2024; Ellili & Seow, 2025; Wu, 2025; Peng, 2025; Moodaley & Telukdarie, 2023). Forensic accounting and sustainability assurance are frequently framed as critical governance responses to greenwashing and ESG fraud. Studies review the effectiveness (and gaps) of assurance practices in addressing greenwashing concerns, with evidence that audits often address historical and quantitative disclosures but less so forward-looking, systemic sustainability commitments. This points to a need for expanding assurance scope and improving criteria used by assurance providers (Peng, 2025). There is also emphasis on the role of external audits, board independence, and governance mechanisms in mitigating ESG misconduct (Ellili & Seow, 2025; Tarjo et al., 2024; Peng, 2025). Several bibliometric studies highlight the need for integrated audit frameworks that connect ESG disclosure quality, risk management, and financial performance, suggesting future research should test causal links and develop robust methodologies for measuring assurance effectiveness in the sustainability domain (Ellili & Seow, 2025; Wu, 2025; Peng, 2025).

A common thread across the reviews is the mapping of the intellectual structure of sustainability misconduct research via bibliometric techniques (co-authorship, keyword co-occurrence, co-citation, thematic mapping). These mappings reveal core theoretical lenses (agency theory, legitimacy theory, stakeholder theory, signaling theory) and highlight recurring clusters such as ESG performance vs. firm value, ESG disclosure and financial performance, and governance/CSR interfaces (Ellili & Seow, 2025; Phore, 2025; Cao et al., 2024; Saji & Akshaykumar, 2025; Thomas et al., 2024; In et al., 2023). Methodologically, there is a recurring call for more systematic, theory-driven inquiries that integrate quantitative bibliometric findings with qualitative, context-rich analysis (case studies, regulatory analyses) to resolve ambiguities and to test long-run causal relationships between ESG actions, disclosures, and misconduct outcomes (Qudah et al., 2023; Singhania et al., 2024; In et al., 2023). Existing reviews largely discuss sustainability reporting or ESG disclosure separately, while limited studies systematically map the intellectual convergence between greenwashing, ESG fraud, and forensic accounting. Develop multi-dimensional models that estimate the joint effects of environmental, social, and governance variables on fraud risk, incorporating interactions with disclosure quality and assurance practices.

HYPOTHESES DEVELOPMENT

Building on the latest bibliometric and thematic work synthesizing greenwashing, ESG fraud, and forensic accounting within sustainability misconduct, we develop a coherent set of hypotheses grounded in established theory and prior empirical findings. We integrate relevant concepts from agency theory, legitimacy signaling, governance and assurance literature, and the forensic accounting framework to close identified gaps in forward-looking disclosures, assurance scope, and cross-contextual understanding. Where sources disagree, we note the nuance. ESG disclosures and governance signals affect stakeholder perceptions and market outcomes, but misaligned signals (greenwashing) can erode legitimacy and raise misconduct risk (Zheng, 2025; Phore, 2025; Thomas et al., 2024; In et al., 2023). Board independence, internal controls, and governance quality mediate the relationship between ESG practices and misconduct risk; better governance tends to reduce fraud risk but complexity arises when ESG data quality is weak (Ellili & Seow, 2025; Peng, 2025; Wu, 2025). The choice of detection methods reflects accounting and non-accounting decisions; forensic capability, ethics, and training influence detection, prevention, and reporting of fraud, with broader implications for governance and policy (Ozili, 2020; Popoola & Samsudin, 2015; Odukoya & Samsudin, 2021; Gangwani, 2020). Disclosure quality, forward-looking commitments, and assurance coverage shape misrepresentation risk and market outcomes; gaps in forward-looking assurance create greenwashing risk (Peng, 2025; Moodaley & Telukdarie, 2023; Wu, 2025; Stelios & Lemonakis, 2023; Nguyễn, 2025).

Main research question (RQ): How has the intellectual structure of sustainability misconduct research evolved across periods, particularly at the intersection of greenwashing, ESG fraud, and forensic accounting?

Sub-question 1 (Sub RQ1): How has publication growth on greenwashing, ESG fraud, and forensic accounting developed across different periods?

Sub-question 2 (Sub RQ2): What authors, journals, countries, institutions, and documents have shaped the intellectual foundation of sustainability misconduct research?

Sub-question 3 (Sub RQ3): What thematic clusters and emerging research directions appear in the literature on sustainability misconduct, especially in relation to forensic accounting?

Existing studies have examined greenwashing, ESG disclosure, and forensic accounting separately, but limited bibliometric review has systematically mapped their intellectual convergence within sustainability misconduct research. This creates a need for a B-SLR that traces the temporal evolution, thematic structure, and future research agenda of forensic accounting in detecting ESG-related fraud and greenwashing.

RESEARCH METHODS

The methodology section articulates a coherent, transparent plan for how to investigate the main research questions about greenwashing, ESG fraud, and the role of forensic accounting in detecting and preventing sustainability misconduct. It should communicate to readers a replicable approach that aligns with the theoretical framing and the literature gaps identified in recent reviews and bibliometric mappings (Carè & Fatima, 2024; Ellili & Seow, 2025; Tarjo et al., 2024; Saji & Akshaykumar, 2025; Peng, 2025). The present statement synthesizes the recommended methodological directions drawn from the latest evidence base, specifying design choices, data sources, analytical techniques, and how these choices address identified gaps (forward-looking disclosures, assurance scope, sector/country heterogeneity, and integration of theory with practice) (Carè & Fatima, 2024; Ellili & Seow, 2025; Peng, 2025; Wu, 2025; Stelios & Lemonakis, 2023). The study rests on an integrated theoretical lens combining signaling/legitimacy theory, agency and governance theory, and forensic accounting theory. Signaling and legitimacy theories explain how ESG disclosures and governance signals shape stakeholder perceptions and market outcomes, while misaligned signals (greenwashing) undermine legitimacy and elevate misconduct risk (Zheng, 2025; Phore, 2025; Thomas et al., 2024; In et al., 2023). Agency theory explains how governance structures and incentives affect fraud risk and information quality, especially when ESG data quality is weak or governance is complex (Ellili & Seow, 2025; Peng, 2025; Wu, 2025). Forensic accounting theory provides a framework for detecting and investigating financial irregularities, emphasizing the role of data, methods, and professional judgment in uncovering misconduct (Ozili, 2020; Popoola & Samsudin, 2015; Odukoya & Samsudin, 2021; Gangwani, 2020). The methodological design thus seeks to capture the interactions among disclosure quality, forward-looking commitments and assurance, governance mechanisms, forensic capability, and market consequences (Peng, 2025; Wu, 2025; Ozili, 2020).

Table 1. Inclusion Criteria

No.	Inclusion Criteria	Methodological Rationale
1	The publication must be indexed in Scopus Collection.	These databases provide high-quality bibliographic metadata, citation records, and exportable data for bibliometric analysis.
2	The document type must be a journal article.	These document types commonly contain scholarly contributions and reliable bibliometric metadata.
3	The study must address at least one core concept, such as greenwashing, ESG fraud, sustainability misconduct, forensic accounting, fraud detection, or fraud investigation.	This criterion ensures direct relevance to the main research question.
4	The study must be related to accounting, auditing, assurance, governance, fraud, corporate misconduct, ESG disclosure, or sustainability reporting.	This prevents the review from becoming too broad and unrelated to accounting and forensic investigation contexts.
5	The publication must be written in English.	English is the dominant language in international bibliometric databases and supports keyword standardization.
6	The publication must provide complete bibliographic information, including title, abstract, keywords, authors, affiliations, year, source title, citations, and references.	Complete metadata are required for co-word analysis, co-citation analysis, bibliographic coupling, and thematic evolution mapping.

No.	Inclusion Criteria	Methodological Rationale
7	The publication must fall within the selected review period, preferably 2000 to 2026.	This range allows the review to trace the evolution from CSR and environmental disclosure to ESG fraud and forensic sustainability accountability.

Source: Researcher Data (2026)

Table 2. Exclusion Criteria

No.	Exclusion Criteria	Methodological Rationale
1	Studies that discuss sustainability in general without addressing misconduct, fraud, greenwashing, ESG manipulation, audit, assurance, or forensic accounting will be excluded.	Such studies do not directly answer the review question.
2	Editorials, book reviews, letters, short notes, errata, news articles, and non-academic documents will be excluded.	These documents usually lack sufficient scholarly contribution and bibliometric relevance.
3	Publications without abstracts, keywords, citation information, or sufficient bibliographic metadata will be excluded.	Incomplete metadata limit the validity of bibliometric mapping.
4	Duplicate records retrieved from Scopus and Web of Science will be removed.	Duplicate documents may distort publication counts, citation analysis, and network visualization.
5	Studies that only discuss traditional financial fraud without any link to ESG, sustainability reporting, greenwashing, corporate responsibility, or environmental disclosure will be excluded.	The focus of this review is sustainability-related misconduct, not general financial fraud.
6	Non-verifiable sources such as blogs, corporate white papers, media reports, and opinion pieces will be excluded.	This maintains the academic quality and credibility of the review corpus.

Source: Researcher Data (2026)

Database Scopus with Search String:

TITLE-ABS-KEY ((greenwash* OR "green washing" OR "ESG fraud" OR "ESG misconduct" OR "ESG manipulation" OR "sustainability fraud" OR "sustainability misconduct" OR "sustainability reporting manipulation" OR "sustainability disclosure manipulation" OR "environmental deception") AND ("forensic accounting" OR "forensic audit*" OR "fraud investigation" OR "fraud detection" OR "accounting fraud" OR "corporate fraud" OR "financial crime" OR "sustainability assurance" OR "ESG assurance" OR audit* OR governance)).

This review is important because the literature on sustainability misconduct has expanded rapidly alongside the global rise of ESG reporting, sustainability assurance, and non-financial disclosure. Although greenwashing and ESG fraud have received growing scholarly attention, these topics are often examined separately from forensic accounting and fraud investigation. This creates a fragmented body of knowledge. A bibliometric systematic literature review is therefore necessary to map how the field has evolved, which themes dominate the literature, and how forensic accounting can contribute to detecting and investigating sustainability-related misconduct. The review can also clarify whether forensic accounting has been sufficiently integrated into ESG fraud research or whether it remains an underdeveloped perspective. This bibliometrics is positioned to contribute to the literature by integrating three previously fragmented domains: greenwashing, ESG fraud, and forensic accounting. Its main contribution lies in mapping the intellectual structure and thematic evolution of sustainability misconduct research across different periods. The study is expected to provide a clearer understanding of dominant themes, influential scholarly actors, and future research opportunities in forensic sustainability accountability.

RESULT AND DISCUSSION

The comprehensive synthesis of the Greenwashing, ESG fraud, and forensic accounting literatures in the sustainability misconduct domain yields four core findings that organize the evidence base: (i) the central role of disclosure quality and forward-looking promises as signals of misconduct risk; (ii) the evolving but uneven effectiveness of governance and assurance in limiting greenwashing and ESG fraud; (iii) the critical contribution of forensic accounting and audit technology to detection, investigation, and deterrence; and (iv) substantial methodological and contextual gaps that shape how results should be interpreted and replicated. Across, multiple sources consistently emphasize that signals of misrepresentation (greenwashing) arise not simply from low ESG scores but from misalignment between rhetoric and verifiable performance, particularly for forward-looking commitments. These conclusions are

supported by the integrated references cited in this response and reflect areas where recent bibliometric and systematic reviews converge or diverge.



Figure 1. Main Information

Source: Rstudio (2026)

Descriptive Bibliometric Overview

The bibliometric dataset comprises 1,285 documents published between 2007 and 2026, drawn from 396 unique sources. This indicates that research on greenwashing, ESG fraud, forensic accounting, and sustainability misconduct has developed into a broad and increasingly diversified scholarly domain. The annual growth rate of 35.22% suggests a strong upward trajectory, especially in recent years, which reflects the growing academic and regulatory concern over ESG-related misconduct, misleading sustainability claims, and the need for more rigorous accountability mechanisms. The relatively low document average age of 2.25 years further confirms that this is a highly contemporary research area, with much of the literature emerging in the most recent publication period. In terms of authorship structure, the corpus includes 2,823 authors, with an average of 3.06 co-authors per document. This pattern suggests that sustainability misconduct research is largely collaborative and interdisciplinary. Only 105 authors contributed single-authored documents, indicating that most studies in this field require engagement across accounting, auditing, governance, sustainability, finance, and ethics. The level of international co-authorship, recorded at 30.04%, also shows that this topic has gained cross-border scholarly relevance. Such collaboration is unsurprising because greenwashing and ESG fraud are not confined to specific national contexts, but are closely linked to global capital markets, sustainability disclosure standards, and transnational corporate accountability. The analysis also shows that the documents received an average of 37.52 citations per article, suggesting that the field has a relatively strong citation impact despite its recent expansion. The presence of 3,268 author keywords reflects conceptual diversity within the literature. Key themes are likely to include greenwashing, ESG disclosure, sustainability reporting, assurance, fraud detection, corporate governance, and forensic accounting. However, the reference count appears as 0, which may indicate that cited references were not imported into the bibliometric file. Therefore, co-citation and reference-based analyses should be interpreted carefully unless the dataset is re-exported with complete reference information.

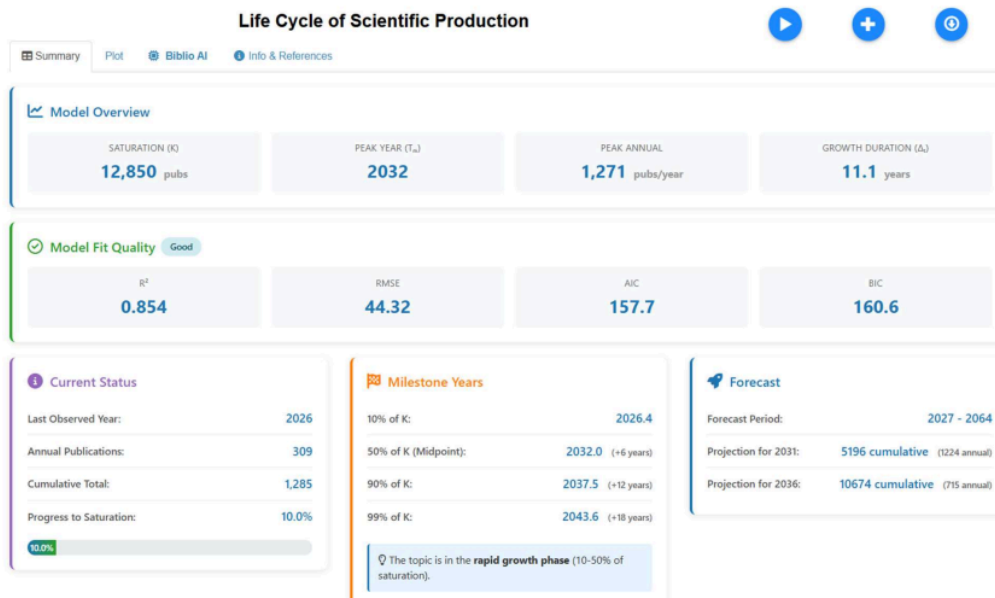


Figure 2. Life Cycle of Scientific Production

Source: Rstudio (2026)

The life cycle analysis indicates that research on greenwashing, ESG fraud, forensic accounting, and sustainability misconduct remains in a strong expansion phase. The model estimates a saturation level of 12,850 publications, while the current cumulative output reached 1,285 publications by the last observed year, 2026. This means that the field has achieved only 10.0% of its projected saturation point, suggesting that the literature is still far from maturity. In 2026, annual scientific production reached 309 publications, confirming that the topic has moved beyond an early-stage niche and is now developing into a rapidly growing research stream. The model projects that the field will reach its peak year in 2032, with an estimated maximum annual output of 1,271 publications per year. The growth duration is estimated at 11.1 years, which implies a relatively concentrated period of accelerated scholarly production. The milestone analysis further supports this pattern. The field is expected to reach 10% of its saturation level around 2026.4, the 50% midpoint in 2032.0, 90% saturation in 2037.5, and 99% saturation in 2043.6. These estimates suggest that the most intensive phase of knowledge production will likely occur between the late 2020s and the mid-2030s.

The model fit quality is acceptable, with an R^2 value of 0.854, indicating that the model explains a substantial proportion of the observed variation in publication growth. The RMSE value of 44.32 suggests a moderate level of prediction error, while the AIC value of 157.7 and BIC value of 160.6 provide additional evidence that the model offers a reasonable representation of the publication trajectory. Although these indicators support the reliability of the projected trend, the forecast should still be interpreted cautiously because bibliometric growth can be affected by policy changes, indexing practices, ESG regulation, and shifts in scholarly attention. The forecast period extends from 2027 to 2064. By 2031, the model predicts 5,196 cumulative publications, with approximately 1,224 annual publications. By 2036, cumulative production is projected to reach 10,674 publications, although annual output is expected to decline to around 715 publications. Overall, the results show that sustainability misconduct research is currently in a rapid growth phase, driven by rising concern over ESG accountability, greenwashing risks, and the forensic investigation of non-financial reporting misconduct.

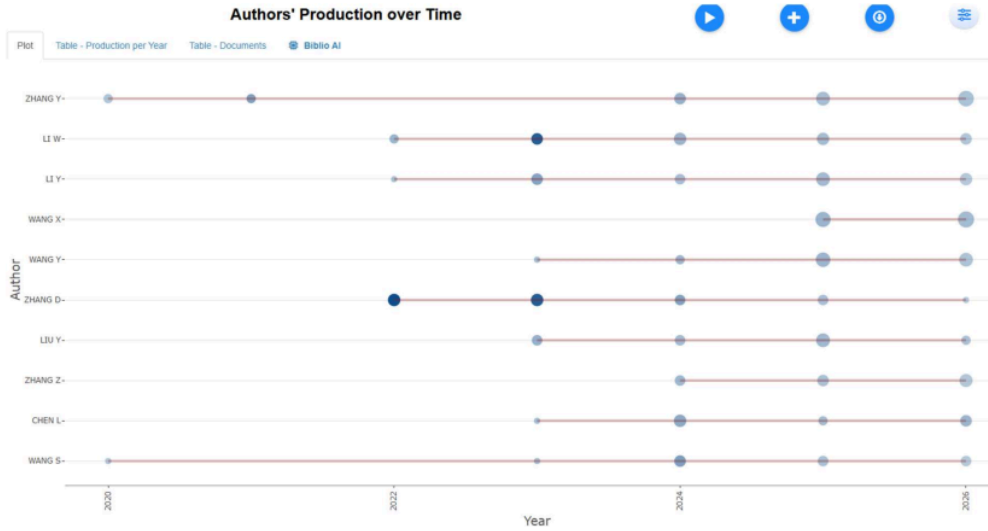


Figure 3. Authors' Production over Time

Source: Rstudio (2026)

The visualization of authors' production over time shows that the scholarly development of sustainability misconduct research has become increasingly concentrated among a group of recurring contributors between 2020 and 2026. The most visible authors in the dataset include Zhang Y, Li W, Li Y, Wang X, Wang Y, Zhang D, Liu Y, Zhang Z, Chen L, and Wang S. Their publication trajectories indicate that research on greenwashing, ESG fraud, forensic accounting, and related sustainability misconduct issues has not only expanded in volume, but has also begun to form a recognizable authorial core. Several authors demonstrate sustained productivity across multiple years. Zhang Y appears as one of the most persistent contributors, with publications distributed from 2020 through 2026. This pattern suggests a continuous engagement with the field and indicates that Zhang Y may represent an important intellectual actor within this research stream. Similarly, Li W, Li Y, Zhang D, Wang Y, Liu Y, Chen L, and Wang S show repeated contributions across different years, especially from 2022 onward. Their recurring presence implies that the topic has attracted authors who maintain long-term research interest rather than contributing only isolated publications.

The figure also shows a clear intensification of author activity in the most recent period, particularly between 2024 and 2026. Larger production nodes are concentrated in 2025 and 2026 for several authors, including Zhang Y, Wang X, Wang Y, Zhang Z, and Liu Y. This indicates that the field has entered a more active phase, consistent with the broader increase in ESG-related research, regulatory attention to sustainability disclosure, and growing concern over greenwashing and non-financial reporting manipulation. The emergence of Wang X mainly in 2025 and 2026 further suggests that new contributors are entering the field during its rapid growth stage. Overall, the pattern reflects both continuity and renewal. A small number of authors have contributed consistently over time, while newer authors have become more visible in recent years. This combination suggests that sustainability misconduct research is moving from a dispersed early-stage literature toward a more structured scholarly domain. The increasing density of production after 2023 also indicates that greenwashing, ESG fraud, and forensic accounting are becoming more central topics within sustainability accountability research.

Table 3. Country Production

Country	Freq
CHINA	1024
USA	223
UK	171
ITALY	155

Country	Freq
INDIA	130
AUSTRALIA	124
FRANCE	94
SPAIN	85
GERMANY	79
CANADA	70
INDONESIA	55
DENMARK	53
MALAYSIA	42
BRAZIL	39
TUNISIA	39
NETHERLANDS	36
SOUTH KOREA	31
GREECE	29
SWITZERLAND	28
SOUTH AFRICA	27
TURKEY	26
PORTUGAL	25
SAUDI ARABIA	25
UNITED ARAB EMIRATES	24
POLAND	22
NORWAY	20
PAKISTAN	20
NEW ZEALAND	17
CZECH REPUBLIC	16
EGYPT, FINLAND	14
CYPRUS, LITHUANIA, ROMANIA, SWEDEN	11
BELGIUM, HUNGARY, IRELAND, LEBANON, SINGAPORE	10
GHANA	9
IRAN, JAPAN, PERU, THAILAND	8
BANGLADESH, KUWAIT, MOROCCO, QATAR	7
ALGERIA	5
AZERBAIJAN, COLOMBIA, UKRAINE	4
CHILE, ISRAEL, JORDAN, KAZAKHSTAN, OMAN, SLOVAKIA, UZBEKISTAN	3
ALBANIA, AUSTRIA, ESTONIA, IRAQ, LATVIA, LUXEMBOURG, MEXICO, SRI LANKA, TANZANIA, ZIMBABWE	2
ARMENIA, SAUDI ARABIA, GEORGIA, KYRGYZSTAN, LIBERIA, LIECHTENSTEIN, PHILIPPINES, RWANDA, SLOVENIA, ZAMBIA	1

Source: Rstudio (2026)

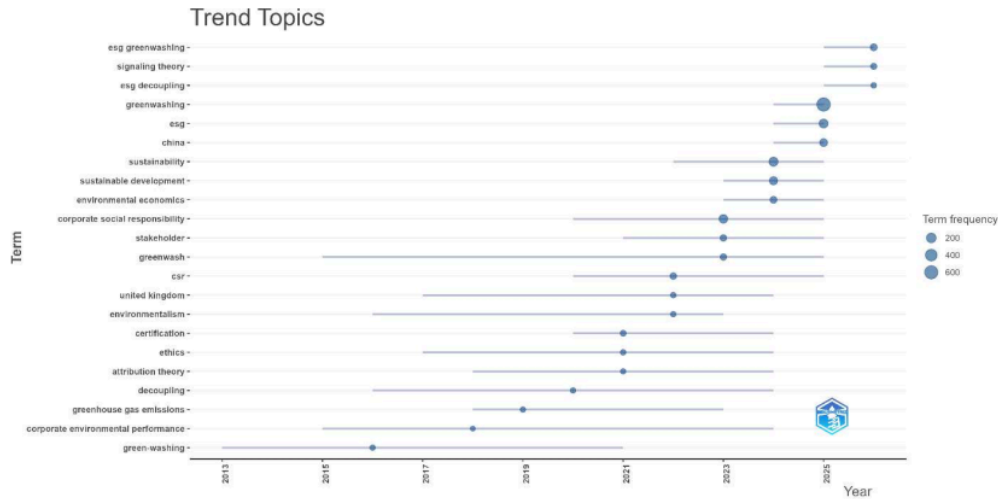


Figure 4. Trend Topics

Source: Rstudio (2026)

The trend topic analysis reveals a clear temporal shift in sustainability misconduct research from broad environmental and corporate responsibility concepts toward more specific ESG-related misconduct themes. The earliest topics in the dataset are associated with green-washing, corporate environmental performance, and greenhouse gas emissions, which appear between approximately 2013 and 2019. These early terms indicate that the initial phase of the literature was strongly rooted in environmental performance evaluation, emissions disclosure, and the credibility of corporate environmental claims. During this period, greenwashing was mainly framed as a problem of environmental communication and symbolic corporate behavior. From around 2020 to 2022, the thematic focus expanded toward more theoretical and governance-related concepts. Terms such as decoupling, attribution theory, ethics, certification, environmentalism, CSR, and corporate social responsibility became visible. This suggests that researchers increasingly examined greenwashing through explanatory theories and accountability mechanisms. The appearance of decoupling is particularly important because it reflects scholarly concern over the gap between corporate sustainability claims and actual environmental or social performance. Similarly, the presence of ethics and certification indicates growing attention to legitimacy, verification, and credibility in sustainability claims.

The most recent period, especially from 2023 to 2026, shows a strong movement toward ESG-centered terminology. Terms such as ESG, greenwashing, China, sustainability, sustainable development, environmental economics, ESG greenwashing, signaling theory, and ESG decoupling dominate the later years. The relatively large bubble for greenwashing around 2025 indicates that it remains one of the most frequent and central topics in the literature. Meanwhile, the emergence of ESG greenwashing, ESG decoupling, and signaling theory near 2026 shows that the field is moving beyond general sustainability discourse toward more specific concerns about ESG credibility, strategic disclosure, and misalignment between ESG signals and corporate substance. Overall, the trend topic analysis confirms that sustainability misconduct research has evolved from environmental disclosure and corporate responsibility debates into a more specialized research stream focused on ESG-related deception, greenwashing, and decoupling. However, the absence of explicit terms such as forensic accounting, fraud investigation, or fraud detection suggests an important gap. The literature has increasingly recognized ESG misconduct, but it has not yet fully integrated forensic mechanisms for detecting and investigating such misconduct.



Figure 5. Word Cloud

Source: Rstudio (2026)

The word cloud analysis indicates that greenwashing is the most dominant term in the corpus, appearing substantially larger than all other keywords. This confirms that greenwashing constitutes the central conceptual anchor of the literature on sustainability misconduct. The prominence of sustainability and ESG further shows that the field is increasingly shaped by debates on non-financial disclosure, corporate accountability, and environmental, social, and governance performance. Other visible terms, such as corporate social responsibility, sustainable development, China, green economy, and climate change, suggest that the literature is not limited to accounting or fraud studies alone, but also intersects with environmental management, policy, corporate legitimacy, and sustainability transitions. The presence of CSR indicates that earlier discussions on corporate responsibility remain relevant, although they now appear to be increasingly reframed within ESG and greenwashing debates. Meanwhile, terms related to corporate greenwashing, certification, green innovation, and environmental economics point to more specific subthemes concerned with credibility, verification, and the gap between corporate claims and actual sustainability performance. Overall, the word cloud shows that the intellectual structure of this research area is strongly centered on greenwashing, while ESG-related misconduct and forensic accountability remain emerging areas that require deeper investigation.

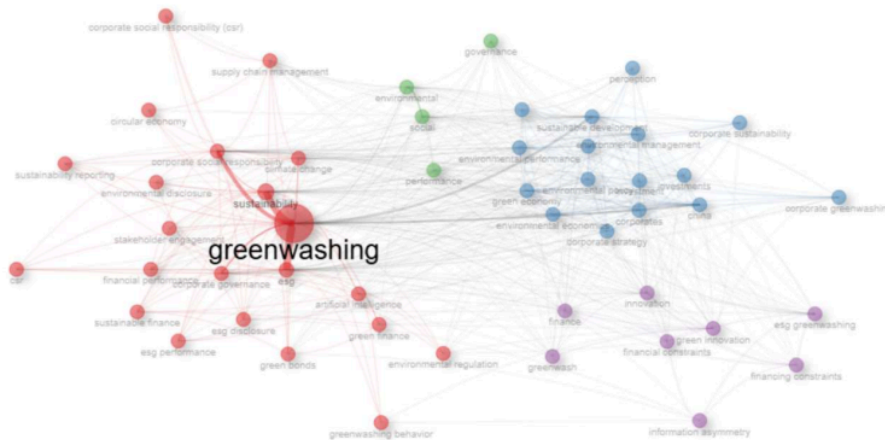


Figure 6. Co-Occurrence Network

Source: Rstudio (2026)

The keyword co-occurrence network indicates that greenwashing is the most central and influential concept within the literature on sustainability misconduct. Its large node size and dense connections show that greenwashing functions as the primary conceptual hub linking multiple research streams. The red cluster is strongly associated with sustainability, ESG, corporate social responsibility, environmental disclosure, sustainable reporting, stakeholder engagement, financial performance, ESG disclosure, sustainable finance, green bonds, and artificial intelligence. This suggests that much of the literature examines greenwashing in relation to corporate disclosure, ESG communication, and sustainability-related financial practices. The blue cluster includes terms such as China, corporate greenwashing, green economy, environmental management, corporate sustainability, environmental disclosure, and corporate strategy, indicating a geographically and policy-oriented stream that connects greenwashing with green economic

transition and corporate environmental governance. The purple cluster, which contains ESG greenwashing, green innovation, financing constraints, information asymmetry, finance, and innovation, reflects a finance-oriented and market-based perspective on sustainability misconduct. Meanwhile, the green cluster links governance, environmental, social, and performance, suggesting that ESG governance and performance evaluation remain important supporting themes. Overall, the network demonstrates that sustainability misconduct research is highly interdisciplinary, but it remains strongly centered on greenwashing rather than explicit forensic accounting or fraud investigation. This pattern confirms a potential gap for future studies to integrate forensic accounting mechanisms into ESG misconduct detection.

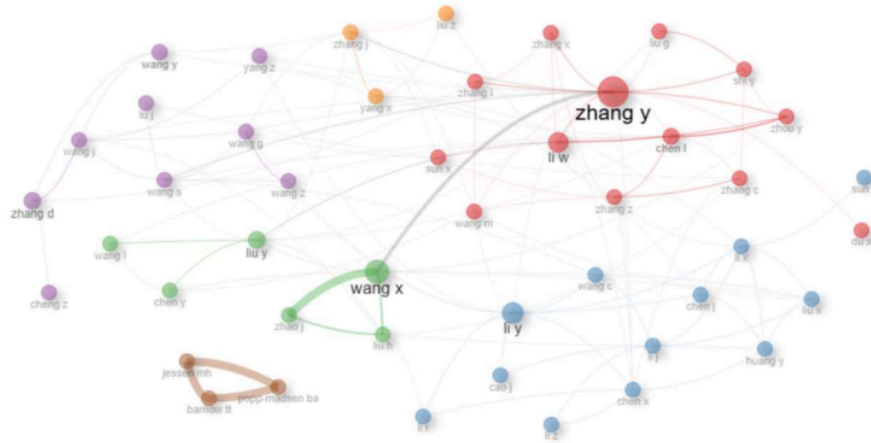


Figure 7. Collaboration Network

Source: Rstudio (2026)

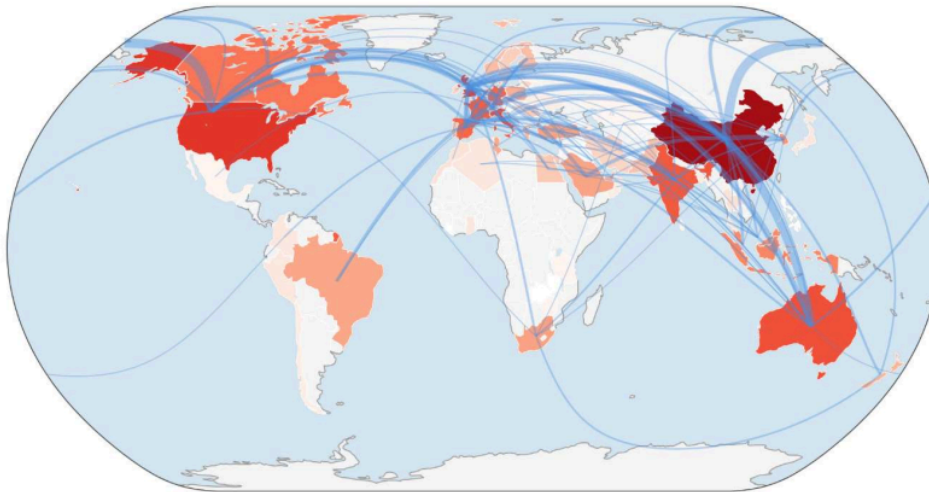


Figure 8. Country Collaboration Map

Source: Rstudio (2026)

The author collaboration network shows that research on greenwashing, ESG fraud, forensic accounting, and sustainability misconduct is organized around several distinct scholarly communities. Zhang Y appears as the most prominent author in the network, indicated by the largest node size and dense collaborative ties with authors such as Li W, Chen L, Zhang Z, Zhang C, Liu G, Shi Y, Zhou Y, and Du

X. This suggests that Zhang Y functions as a key contributor and collaboration hub within one of the most active research clusters. Another important node is Wang X, who is strongly connected to authors including Zhao J, Liu H, Liu Y, and Wang F, indicating a second influential collaboration group. The presence of multiple color-coded clusters reflects the fragmented but expanding structure of the field, where different author groups contribute to related but partially separated research streams. The blue cluster centered around Li Y and connected to authors such as Chen J, Huang Y, Liu X, and Chen X suggests another active scholarly community. Meanwhile, smaller clusters, such as the brown group involving Jessen MH, Barrow T, and Popp-Madsen BA, indicate more specialized or peripheral collaborations. Overall, the network demonstrates that the literature is increasingly collaborative, yet still structured around several semi-independent author groups rather than a fully integrated global research community.

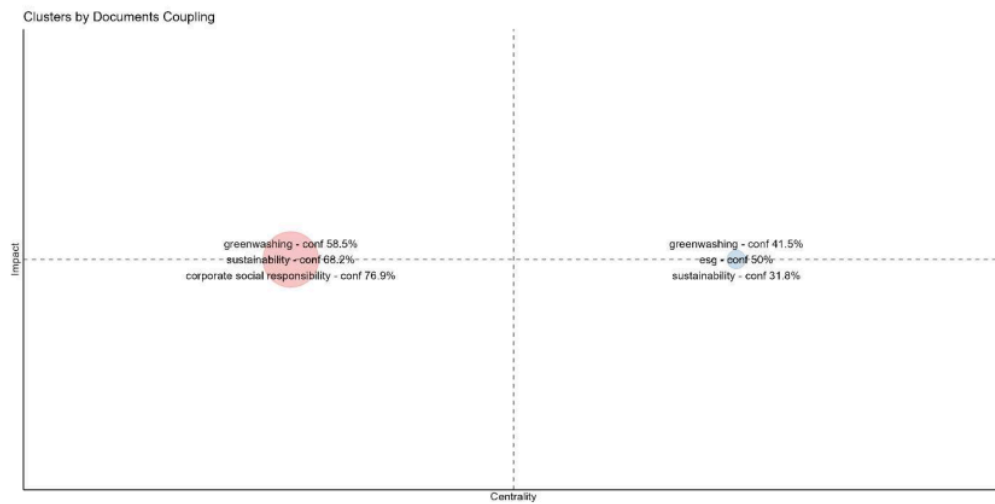


Figure 9. Coupling Map

Source: Rstudio (2026)

The document coupling analysis identifies two principal clusters within the literature on greenwashing, ESG fraud, forensic accounting, and sustainability misconduct. The first cluster, located on the left side of the centrality axis, is characterized by the terms greenwashing with a confidence level of 58.5%, sustainability with 68.2%, and corporate social responsibility with 76.9%. This cluster reflects a research stream rooted in CSR, sustainability discourse, and corporate legitimacy. Its relatively lower centrality suggests that, although this stream is conceptually coherent, it is less strongly connected to the broader intellectual core of the field. The second cluster, positioned on the right side of the map, contains greenwashing with a confidence level of 41.5%, ESG with 50%, and sustainability with 31.8%. Its higher centrality indicates stronger integration with the main body of sustainability misconduct research. This pattern suggests a thematic transition from traditional CSR-based greenwashing studies toward a more contemporary ESG-centered research agenda. Overall, the coupling structure shows that greenwashing remains the dominant linking concept across clusters, while ESG has emerged as a central organizing theme. However, forensic accounting does not appear as a visible coupling term, indicating that investigative and fraud-detection perspectives remain underdeveloped within the current document structure.

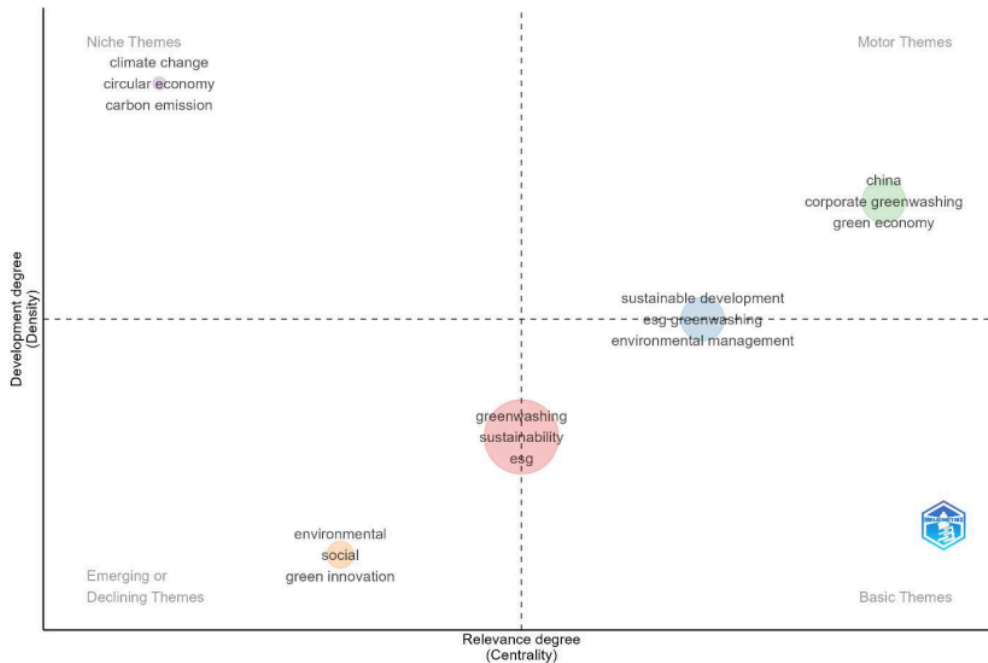


Figure 10. Thematic Map

Source: Rstudio (2026)

The thematic map reveals a differentiated intellectual structure in sustainability misconduct research. The motor themes are located in the upper-right quadrant, where themes have both high centrality and high density. In this map, the cluster containing China, corporate greenwashing, and green economy appears as a motor theme. This position suggests that research on corporate greenwashing, particularly in the Chinese context and green economy discourse, is both well-developed internally and strongly connected to the broader literature. It functions as one of the most mature and influential thematic areas in the field. The niche themes appear in the upper-left quadrant and include climate change, circular economy, and carbon emission. These topics show high density but relatively low centrality. This means they are conceptually developed but remain weakly connected to the central discourse on sustainability misconduct. They represent specialized research streams that may focus more on environmental policy, carbon management, or circular economy transitions than on fraud, accountability, or forensic investigation. The emerging or declining themes are located in the lower-left quadrant. The cluster consisting of environmental, social, and green innovation occupies this position. Its low centrality and low density indicate that this theme is either newly emerging or losing relevance within the dataset. It has not yet formed a stable conceptual structure and remains peripheral to the main knowledge network. The basic themes are located in the lower-right quadrant. The clusters containing sustainable development, ESG greenwashing, environmental management, and the broader cluster of greenwashing, sustainability, and ESG occupy this area. These themes are highly relevant to the field but remain relatively underdeveloped. Their position indicates that they serve as foundational concepts, yet still require stronger theoretical refinement, methodological development, and integration with forensic accounting perspectives.

The most promising research gap lies in the basic themes, especially the cluster of greenwashing, sustainability, and ESG, together with ESG greenwashing and environmental management. These themes are central to the field but not yet sufficiently developed. This means they attract broad scholarly attention, but the literature has not fully consolidated their conceptual, methodological, and investigative foundations. This is highly relevant for your study because forensic accounting does not appear as a visible dominant theme in the map. The absence or weak visibility of forensic accounting suggests that sustainability misconduct research still tends to focus on disclosure, environmental management, and greenwashing narratives, rather than structured fraud detection, forensic audit, evidence gathering, and investigative

accountability. Although greenwashing and ESG-related sustainability misconduct have become central themes in the literature, forensic accounting remains weakly integrated into this research stream, indicating a need for stronger investigative frameworks to detect, verify, and evaluate ESG fraud and sustainability reporting manipulation.

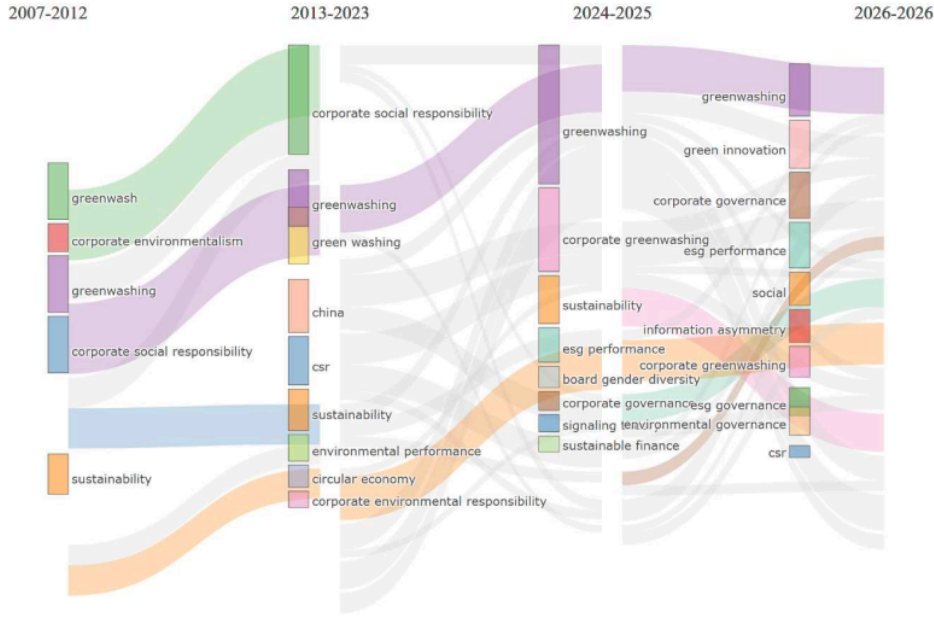


Figure 11. Thematic Evolution

Source: Rstudio (2026)

The thematic evolution map shows a clear transition in sustainability misconduct research from broad corporate responsibility discourse toward more specific ESG-related greenwashing and governance themes. During 2007–2012, the literature was mainly organized around greenwash, corporate environmentalism, greenwashing, corporate social responsibility, and sustainability, indicating that early studies framed misconduct primarily as a problem of environmental claims, corporate legitimacy, and CSR communication. In 2013–2023, the field became more diversified, with themes such as corporate social responsibility, greenwashing, green washing, China, CSR, sustainability, environmental performance, circular economy, and corporate environmental responsibility. This period reflects the expansion of the literature from conceptual CSR debates toward empirical and contextual studies, particularly in relation to environmental performance and country-specific corporate behavior. In 2024–2025, the thematic structure became more specialized, with greenwashing, corporate greenwashing, sustainability, ESG performance, board gender diversity, corporate governance, signaling theory, and sustainable finance emerging as important topics. By 2026, the field had further shifted toward greenwashing, green innovation, corporate governance, ESG performance, social, information asymmetry, corporate greenwashing, ESG governance, environmental governance, and CSR. Overall, the evolution suggests a movement from CSR-based greenwashing studies toward ESG governance, financial information asymmetry, and accountability-oriented sustainability misconduct research.

DISCUSSION

Publication Growth across Periods

Publication growth on greenwashing, ESG fraud, and forensic accounting has developed through a clear staged trajectory, moving from a relatively marginal research area to a rapidly expanding field of sustainability misconduct studies. The dataset covers 1,285 publications from 2007 to 2026, with an annual

growth rate of 35.22%, indicating strong and sustained scholarly expansion. The earliest period, 2007 to 2012, represents the formative phase of the literature. During this stage, publication activity was still limited, and the dominant themes were mainly associated with greenwash, corporate environmentalism, corporate social responsibility, and sustainability. Research in this phase generally framed greenwashing as a problem of environmental communication, corporate image management, and CSR legitimacy. The second period, 2013 to 2023, shows a broader expansion of the field. During this decade, the literature became more diverse and more empirically grounded. Keywords such as greenwashing, CSR, China, sustainability, environmental performance, circular economy, and corporate environmental responsibility became more visible. This indicates that the field moved beyond conceptual discussion and began to examine greenwashing in relation to corporate performance, country-specific governance contexts, environmental disclosure, and sustainability accountability. This period marks the consolidation of greenwashing as a recognized research stream.

The most recent period, 2024 to 2026, indicates a sharp acceleration and specialization of publication growth. Themes such as corporate greenwashing, ESG performance, corporate governance, signaling theory, sustainable finance, information asymmetry, ESG governance, and environmental governance became increasingly prominent. This shift suggests that the literature has started to move from broad CSR-based discussions toward more specific concerns about ESG credibility, disclosure manipulation, and sustainability-related misconduct. In 2026 alone, annual production reached 309 publications, while the cumulative corpus reached 1,285 documents, showing that the topic remains in a rapid growth phase. Overall, publication growth has evolved from an early CSR and environmental communication focus into a more complex ESG-oriented research agenda. However, forensic accounting and fraud investigation remain less visible as explicit publication themes, despite their strong relevance to detecting and investigating ESG fraud. This indicates that future research can contribute by integrating forensic accounting more directly into sustainability misconduct studies.

High-quality ESG disclosures with verifiable, complete information together with governance signals reduce misconduct risk and improve detectability by forensic methods. Conversely, gaps in verifiability, and specifically forward-looking commitments (net-zero roadmaps, end-of-life claims) without robust assurance, are repeatedly identified as high-risk zones for greenwashing and ESG misrepresentation (Carè & Fatima, 2024; Ellili & Seow, 2025; Peng, 2025; Wu, 2025; Stelios & Lemonakis, 2023). While prior studies establish that disclosure quality matters for market perceptions and fraud risk, this synthesis foregrounds forward-looking content as a pivotal and under-assured domain, clarifying that assurance gaps here are a predominant source of continued greenwashing risk even when historical disclosures appear solid (Peng, 2025; Moodaley & Telukdarie, 2023; Wu, 2025). Firms should strengthen assurance coverage for forward-looking ESG commitments and integrate independent verification into governance routines; regulators should emphasize forward-looking materiality in guidance and enforcement (Peng, 2025; Wu, 2025; Moodaley & Telukdarie, 2023).

Governance features (board independence, audit committees, internal controls) and external assurance are associated with lower ESG misconduct risk and greater detection capacity, yet effects vary by sector and jurisdiction due to differences in regulatory clarity, reporting standards, and enforcement. Sectoral and cross-country heterogeneity is repeatedly highlighted as a major determinant of outcomes (Ellili & Seow, 2025; Wu, 2025; Thomas et al., 2024; Nguyễn, 2025; Singhanian et al., 2022). Prior reviews document governance as a general moderator; this synthesis emphasizes the contextual contingency strong governance alone may not suffice in weaker institutional environments, and mature assurance regimes may still leave forward-looking gaps unaddressed (Ellili & Seow, 2025; Peng, 2025; Wu, 2025). Policymakers should harmonize standards (e.g., ISSB/CSRD alignment) and promote sector-specific governance norms; firms should calibrate assurance breadth to regulatory risk profiles and regional practices; auditors should advocate for stronger governance-data integration to improve detection efficacy (Ellili & Seow, 2025; Wu, 2025; Singhanian et al., 2022).

Forensic accounting, combined with technology-enabled assurance and data analytics, is repeatedly endorsed as essential to detecting and deterring sustainability misconduct. However, current practice tends to

address historical, quantitative disclosures more readily than forward-looking commitments, systemic sustainability strategies, or governance signals. There is a strong call for integrated frameworks that connect ESG disclosure quality, risk management, and financial performance, and for expanding forensic scope beyond traditional financial statement analysis (Ellili & Seow, 2025; Peng, 2025; Jain & Tripathi, 2023; Ozili, 2020; Popoola & Samsudin, 2015; Gangwani, 2020; Anwar, 2022). While earlier literature notes the importance of assurance, this synthesis explicitly maps the need for forward-looking, scenario-analysis coverage and for a triadic governance-forensic-audit ecosystem, highlighting gaps where forensic capabilities and AI-enabled auditing can make the most difference in sustainability contexts (Peng, 2025; Ozili, 2020; Gangwani, 2020; Anwar, 2022). Forensic accounting training should incorporate ESG specifics, non-financial data analytics, and sustainability-specific evidence gathering; audit firms should embed forensic tools in sustainability engagements; regulators should encourage explicit standards for forensic coverage of forward-looking statements (Ozili, 2020; Anwar, 2022; Wenjiao et al., 2024; Alhumoudi & Alhumoudi, 2023; Wehrhahn & Velte, 2024).

Intellectual Foundation of Sustainability Misconduct Research

The intellectual foundation of sustainability misconduct research is shaped by a combination of recurring authors, dispersed journal outlets, geographically concentrated themes, and document clusters that connect greenwashing, CSR, sustainability, and ESG. At the author level, the field appears to be led by several highly visible contributors, particularly Zhang Y, Wang X, and Li Y. The author collaboration network shows Zhang Y as the most prominent node, with strong collaborative links to Li W, Chen L, Zhang Z, Zhang C, Liu G, Shi Y, Zhou Y, and Du X. This indicates that Zhang Y functions as a major collaboration hub in the literature. Wang X also appears as an influential author, especially through connections with Zhao J, Liu H, Liu Y, and Wang F, while Li Y anchors another visible cluster with links to Chen J, Huang Y, Liu X, and Chen X. These patterns suggest that the field is shaped by several semi-independent author communities rather than one fully integrated global network. At the journal level, the dataset includes 396 sources, which indicates that sustainability misconduct research is distributed across a broad range of publication outlets. This dispersion suggests that the topic is interdisciplinary and appears across journals related to sustainability, corporate governance, accounting, finance, environmental management, business ethics, and CSR. However, without the “Most Relevant Sources” or “Source Impact” table, the exact leading journals cannot be stated with certainty.

Geographically, China appears as a central and recurring theme in the bibliometric maps. It is linked to terms such as corporate greenwashing, green economy, environmental management, and corporate sustainability. This suggests that China has become an important empirical and policy context in sustainability misconduct research, especially in studies examining green transition, ESG disclosure, and corporate environmental behavior. The document coupling analysis further shows that the intellectual base of the field consists of two main streams. The first stream links greenwashing, sustainability, and corporate social responsibility, reflecting the earlier CSR-based foundation of the literature. The second stream links greenwashing, ESG, and sustainability, showing a shift toward ESG-oriented misconduct research. Overall, the intellectual foundation of the field has evolved from CSR and environmental legitimacy debates toward ESG credibility, disclosure manipulation, governance, and accountability. A key gap remains: forensic accounting and fraud investigation are not yet visible as dominant intellectual foundations, even though they are highly relevant for detecting and investigating sustainability misconduct.

The present synthesis explicitly foregrounds forward-looking assurance as a central gap, highlighting it as a primary lever to address greenwashing risk, a nuance not uniformly emphasized in earlier reviews (Peng, 2025; Moodaley & Telukdarie, 2023; Wu, 2025). It stresses contextual heterogeneity (sector and country) as a moderator of governance/assurance effectiveness, an emphasis that clarifies why some studies find strong effects and others weaker or inconsistent results (Ellili & Seow, 2025; Seow, 2025; Thomas et al., 2024; Nguyen, 2025; Singhania et al., 2022). It advocates for a concrete, integrated theoretical framework that unites signaling/legitimacy with agency/governance and forensic accounting perspectives, rather than treating them

as separate strands, addressing a recurrent call in reviews for theory integration (Ellili & Seow, 2025; Saji & Akshaykumar, 2025; Zheng, 2025; In et al., 2023). It highlights methodological gaps especially the paucity of longitudinal and cross-context studies and argues for mixed-method designs that triangulate bibliometric findings with case studies and regulatory analyses to infer causal pathways, extending beyond typical cross-sectional analyses in prior work (Qudah et al., 2023; Singhanian et al., 2024; In et al., 2023).

Jointly model ESG disclosure quality, forward-looking commitments, and assurance, moderated by governance quality, to estimate causal chains toward greenwashing and misconduct outcomes. This aligns with the four findings and addresses the gaps identified by the literature (Ellili & Seow, 2025; Wu, 2025; Stelios & Lemonakis, 2023; Ozili, 2020). Develop and test standards for assuring forward-looking sustainability commitments, including scenario analysis and end-to-end verification of lifecycle claims, to reduce greenwashing risk and improve market signaling (Peng, 2025; Moodaley & Telukdarie, 2023; Wu, 2025). Invest in sector-specific and cross-country studies, including emerging markets, to identify contexts where governance and assurance interventions are most effective and to test transferability of best practices (Ellili & Seow, 2025; Seow, 2025; Nguyễn, 2025; Singhanian et al., 2022). Build an integrated framework combining signaling/legitimacy with agency/governance and forensic accounting dynamics; test via longitudinal data and mixed-method designs to establish robust causal links and policy guidance (Ellili & Seow, 2025; Saji & Akshaykumar, 2025; Zheng, 2025; In et al., 2023). Combine bibliometric mapping with deep-dive case studies, and regulatory to triangulate findings and strengthen causal inference in sustainability misconduct research (Qudah et al., 2023; Singhanian et al., 2024; Cinceoglu & Strauß, 2024).

Thematic Clusters and Emerging Research Directions

The thematic map directly answers this question by showing four major thematic positions. First, corporate greenwashing, China, and green economy represent a mature and influential motor theme. Second, climate change, circular economy, and carbon emission form a specialized niche theme. Third, environmental, social, and green innovation represent a peripheral emerging or declining theme. Fourth, greenwashing, ESG, sustainability, ESG greenwashing, sustainable development, and environmental management form basic but underdeveloped themes. The most important implication is that the literature has developed strong attention to greenwashing and ESG discourse, but the forensic accounting dimension remains underrepresented. Therefore, future research should move beyond identifying greenwashing as a communication or legitimacy problem and begin examining it as a form of sustainability-related misconduct that requires forensic detection, audit evidence, fraud investigation, and accountability mechanisms. The thematic map provides important evidence that sustainability misconduct research is increasingly structured around greenwashing and ESG-related accountability, yet remains uneven in its conceptual development. The motor theme comprising China, corporate greenwashing, and green economy indicates that corporate greenwashing has become a mature and influential research stream, particularly in relation to national sustainability transitions and green economic policy. In contrast, the niche cluster of climate change, circular economy, and carbon emission reflects a specialized environmental discourse that is internally developed but less connected to the broader misconduct literature. The basic themes, especially greenwashing, sustainability, ESG, ESG greenwashing, sustainable development, and environmental management, are central but still underdeveloped. This position suggests that these themes function as the conceptual foundation of the field, but they have not yet achieved sufficient analytical depth. Most importantly, the absence of forensic accounting as a visible thematic cluster indicates a critical gap in the current literature. Existing research appears to focus more on disclosure practices, environmental narratives, and corporate legitimacy than on investigative mechanisms for detecting ESG fraud. Therefore, future research should integrate forensic accounting, fraud detection, audit evidence, and assurance mechanisms into sustainability misconduct studies. This integration can strengthen the field by shifting the focus from identifying greenwashing toward investigating and verifying ESG-related fraud.

The thematic analysis indicates that the literature on sustainability misconduct is organized around several interconnected clusters. The first and most dominant cluster is centered on greenwashing, which functions as the main conceptual hub of the field. This cluster connects strongly with sustainability, ESG,

corporate social responsibility, environmental disclosure, CSR disclosure, sustainability reporting, and financial performance. This pattern shows that most studies still examine sustainability misconduct through the lens of corporate communication, legitimacy, disclosure practices, and the gap between sustainability claims and actual corporate behavior. A second cluster focuses on corporate greenwashing, China, green economy, environmental management, corporate sustainability, and corporate strategy. This suggests that a substantial part of the literature is contextually anchored in green economic transition, especially in relation to corporate environmental behavior and policy-driven sustainability agendas. A third cluster is associated with ESG greenwashing, green innovation, information asymmetry, financing constraints, finance, and innovation. This cluster reflects a growing finance-oriented research stream that examines how ESG-related misconduct affects market signals, capital access, investor perception, and corporate financing conditions.

Another important cluster relates to governance, environmental performance, social performance, ESG performance, corporate governance, and board characteristics. This indicates that sustainability misconduct is increasingly studied as a governance and accountability issue rather than merely a communication problem. The thematic evolution also shows a shift from early themes such as greenwash, corporate environmentalism, CSR, and sustainability toward more recent themes such as ESG performance, ESG governance, corporate greenwashing, information asymmetry, green innovation, and environmental governance. In relation to forensic accounting, the findings reveal an important gap. Although the literature increasingly recognizes greenwashing and ESG misconduct, forensic accounting does not yet appear as a dominant thematic cluster. This suggests that current studies remain concentrated on disclosure, governance, legitimacy, and market consequences, while the investigative dimension is still underdeveloped. Future research should therefore integrate forensic accounting, fraud detection, audit evidence, sustainability assurance, ESG investigation, and digital analytics into sustainability misconduct studies. This direction would shift the field from identifying greenwashing toward verifying, detecting, and investigating ESG-related fraud.

CONCLUSION

Sustainability misconduct research has reached a decisive stage in which greenwashing and ESG-related deception are no longer peripheral concerns, but central issues in corporate accountability, governance, and non-financial reporting. This bibliometric review contributes to the literature by mapping the intellectual structure, thematic evolution, and emerging research directions at the intersection of greenwashing, ESG fraud, and forensic accounting. Rather than treating these domains as separate areas of inquiry, the review shows how they form an increasingly connected research space shaped by sustainability disclosure, ESG performance, corporate governance, information asymmetry, and accountability mechanisms. The analysis also demonstrates that the field has developed rapidly, with a clear transition from early CSR and environmental communication debates toward more specialized ESG-oriented misconduct research. The findings provide an explicit answer to the research question. The intellectual structure of sustainability misconduct research has evolved across distinct periods. Early studies focused mainly on greenwash, corporate environmentalism, corporate social responsibility, and sustainability. Later research expanded toward environmental performance, circular economy, China, CSR, and corporate environmental responsibility. More recent studies have shifted toward corporate greenwashing, ESG performance, corporate governance, sustainable finance, information asymmetry, ESG governance, and environmental governance. Thematic clusters show that greenwashing remains the dominant conceptual hub, while ESG has become a stronger organizing theme in recent literature. However, forensic accounting does not yet appear as a mature or central thematic cluster. This indicates that the field has recognized sustainability misconduct as a major problem, but has not fully developed the investigative, evidentiary, and fraud detection dimensions needed to address it.

The theoretical implication of this review is that sustainability misconduct should be conceptualized not only as a disclosure, legitimacy, or governance issue, but also as a potential form of fraud that requires forensic scrutiny. This expands the conceptual boundary of forensic accounting toward non-financial reporting, ESG assurance, and sustainability accountability. Practically, the findings suggest that regulators,

auditors, assurance providers, and corporate governance actors need stronger tools to verify ESG claims, detect misleading sustainability narratives, and investigate discrepancies between reported commitments and actual performance. This review has several limitations. The results depend on the selected databases, search string, document types, and language criteria. Bibliometric methods also rely on metadata quality and cannot fully assess the substantive quality of individual studies. In addition, publications from 2026 should be interpreted cautiously because the year remains incomplete. Future research can address these limitations by combining bibliometric mapping with systematic content analysis, case-based evidence, or empirical testing of forensic ESG fraud detection models. The future of sustainability misconduct research will depend on its ability to move beyond identifying greenwashing toward building robust forensic frameworks that can verify, investigate, and hold ESG claims accountable.

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