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BLOCKCHAIN AND ESG IN CORPORATE SUSTAINABILITY: A SYSTEMATIC LITERATURE REVIEW ON REPORTING, GOVERNANCE, AND PERFORMANCE

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Abstract

Blockchain is increasingly discussed as a digital infrastructure that may support corporate sustainability by improving traceability, preserving records, and strengthening the verification of information. Yet research connecting blockchain with environmental, social, and governance (ESG) practices covers different outcomes, including sustainability reporting, disclosure credibility, corporate ESG performance, technology adoption, and supply-chain governance. This review maps these strands and considers their implications for accounting. The supplied screening workbook contains 40 records, of which 14 were marked "Include," 12 "Maybe," and 14 "Exclude" at the preliminary screening stage. The current synthesis is therefore based on candidate records and available metadata, titles, keywords, and abstracts; it is not presented as a completed full-text review. Four preliminary themes emerge: blockchain for sustainability accounting and reporting; ESG disclosure credibility and accountability; corporate ESG performance and adoption; and governance and traceability in sustainable supply chains. The literature suggests that blockchain may strengthen the traceability of records, but it cannot independently guarantee the validity of source data, prevent greenwashing, or improve substantive ESG outcomes. The review contributes a structured thematic map and identifies research needs around data validation, governance, theory integration, and causal evidence. Full-text assessment, quality appraisal, and a reconciled PRISMA flow remain necessary before publication.

Keywords: accountability; blockchain; ESG; sustainability reporting; transparency

INTRODUCTION

Environmental, social, and governance (ESG) information has become an important part of how companies explain their risks, responsibilities, and long-term sustainability plans. Investors, regulators, lenders, customers, and other stakeholders use this information to assess whether organizations manage their environmental and social impacts responsibly. However, ESG reporting still faces persistent challenges, including inconsistent measurement, limited verifiability, information asymmetry, and the risk that disclosures emphasize positive results while giving less attention to weak performance.

Blockchain has attracted attention because it can maintain a shared, traceable record of transactions and make changes to recorded information more visible. In corporate sustainability, these features may help organizations follow the origin of data, document the reporting process, and coordinate information across departments and supply-chain partners. Still, a reliable record is not necessarily a correct record. If inaccurate emissions, labor, or governance information is entered into the system, blockchain may preserve the error rather than correct it.

The literature on blockchain and ESG extends beyond reporting. Some studies examine whether blockchain adoption is associated with corporate ESG performance, while others explore incentives for disclosure, sustainable finance, digital transformation, or supply-chain governance. These research streams are related, but they measure different outcomes. Better traceability does not necessarily mean better disclosure, and a change in an ESG score does not automatically demonstrate that the underlying reporting process has become more credible.

Previous work has examined blockchain and sustainability from policy and accounting perspectives. Mulligan et al. (2024), for example, review blockchain applications for sustainability policy, while Niu et al. (2024)

propose a blockchain-based incentive mechanism for ESG disclosure through a principal–agent perspective. Such studies suggest that the issue involves not only technology but also the rules, incentives, and responsibilities that shape the information recorded.

This review examines how blockchain is discussed in corporate sustainability, focusing on reporting, governance, and performance. It aims to map the main research themes, distinguish the outcomes examined in the literature, and identify conceptual, theoretical, and methodological gaps relevant to accounting. The present manuscript treats the 14 records marked "Include" in the supplied workbook as preliminary candidates, not as a final sample confirmed through full-text screening. The study is guided by three research questions:

RQ1: What are the main characteristics and themes of research on blockchain and ESG in corporate sustainability?

RQ2: How has blockchain been examined in relation to sustainability reporting, ESG disclosure, governance, and corporate ESG performance?

RQ3: What conceptual, theoretical, and methodological gaps should future accounting research address?

LITERATURE REVIEW

Blockchain and Sustainability Accounting

Blockchain is commonly discussed as an infrastructure that may strengthen the traceability of accounting records and sustainability information. A shared ledger can document when information is entered and how records change, which may be useful when several parties contribute data to a corporate report. In sustainability accounting, however, the usefulness of a record depends on more than its technical integrity. The organization still needs appropriate measurement rules, source-data validation, access controls, correction procedures, and assurance.

Research focused on accounting practices and sustainability reporting is therefore relevant to questions about the reliability of ESG information. The work summarized by Darmawan et al. (2026), Biancone et al. (2025), and Patil et al. (2025) emphasizes potential benefits such as transparent records, verifiability, and improved reporting processes. These claims should be assessed against the underlying study designs and full-text evidence before being generalized.

ESG Disclosure, Credibility, and Accountability

ESG disclosure takes place in an environment where managers often possess more information about corporate practices than external stakeholders. This information asymmetry can create incentives for selective disclosure. Niu et al. (2024) approach this issue through a principal–agent model and propose an incentive mechanism intended to encourage higher-quality ESG disclosure. The study illustrates how blockchain may be considered not only as a place to store records, but also as part of a governance mechanism.

Nevertheless, traceability and credibility are not interchangeable. A tamper-resistant record may still contain incomplete, selectively reported, or inaccurate information. Reducing greenwashing therefore depends on measurement standards, validation of source data, independent checks, and clear accountability for errors. Claims that blockchain prevents greenwashing should be treated as propositions to be tested rather than automatic outcomes of implementation.

Blockchain and Corporate ESG Performance

A separate strand investigates associations between blockchain adoption and ESG performance. Jeong et al. (2025), Wang et al. (2025), and Basdekidou and Papapanagos (2024) examine performance-related outcomes using different contexts and analytical approaches. These studies may help explain whether blockchain adoption is associated with corporate or market outcomes, but their findings should not be used as direct evidence of better reporting unless disclosure quality or credibility is actually measured.

The distinction matters because an ESG score, a disclosure-quality measure, a technology-adoption decision, and a market return are not the same construct. The review therefore treats reporting quality, substantive ESG performance, and financial or market outcomes as separate categories and considers connections among them only when supported by the individual studies.

Governance and Sustainable Supply Chains

ESG information often crosses organizational boundaries. Suppliers, manufacturers, logistics providers, technology vendors, auditors, and customers may each hold part of the evidence needed to assess sustainability impacts. Blockchain can provide a shared traceability infrastructure, but its effectiveness depends on governance:

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who is authorized to enter information, who can access it, how conflicting records are resolved, and who is accountable when the information is inaccurate.

The candidate literature on technology providers and global supply networks, including Wahyana et al. (2026) and Gupta et al. (2026), highlights the importance of coordination, capability building, and accountability across organizations. Traceability is useful only when it is connected to consistent indicators and reporting standards that allow the information to be interpreted and, where appropriate, independently verified.

Research Gap

Three gaps are especially important. First, research does not always distinguish the technical integrity of records from the validity of the source data. Second, reporting, governance, and ESG performance are sometimes discussed together without specifying the mechanisms connecting them. Third, the literature spans different sectors, units of analysis, and research designs, limiting the extent to which broad causal conclusions can be drawn. This review responds by organizing the evidence around reporting, disclosure credibility, performance, and supply-chain governance while keeping their outcomes conceptually distinct.

METHOD

Review Design

The study is designed as a systematic literature review with narrative and thematic synthesis (Snyder, 2019). The manuscript uses PRISMA 2020 as a reporting framework to make the identification, screening, eligibility assessment, and inclusion process transparent (Page et al., 2021a, 2021b). PRISMA is a reporting guideline rather than a guarantee of search completeness or methodological quality. Reproducibility also requires a documented search strategy, consistent eligibility decisions, and a traceable record of exclusions.

Data Source and Preliminary Screening

The supplied screening document reports 40 records in the researcher's workbook. The initial decisions are 14 marked "Include," 12 marked "Maybe," and 14 marked "Exclude" (Table 1). These decisions were made during preliminary screening using available titles, abstracts, keywords, and metadata. The available materials do not establish the original database sources, exact search date, executed search strings, filters, or deduplication counts. These details are therefore not represented here as verified facts. The provisional screening flow is summarized in Image 1.

Table 1. Preliminary screening status in the supplied workbook

Status	Records	Interpretation
Include	14	Preliminary candidates; full-text verification is still required
Maybe	12	Relevance requires full-text assessment
Exclude	14	Preliminary exclusions; reasons should be checked
Total	40	Records present in the workbook; search and deduplication history not verified

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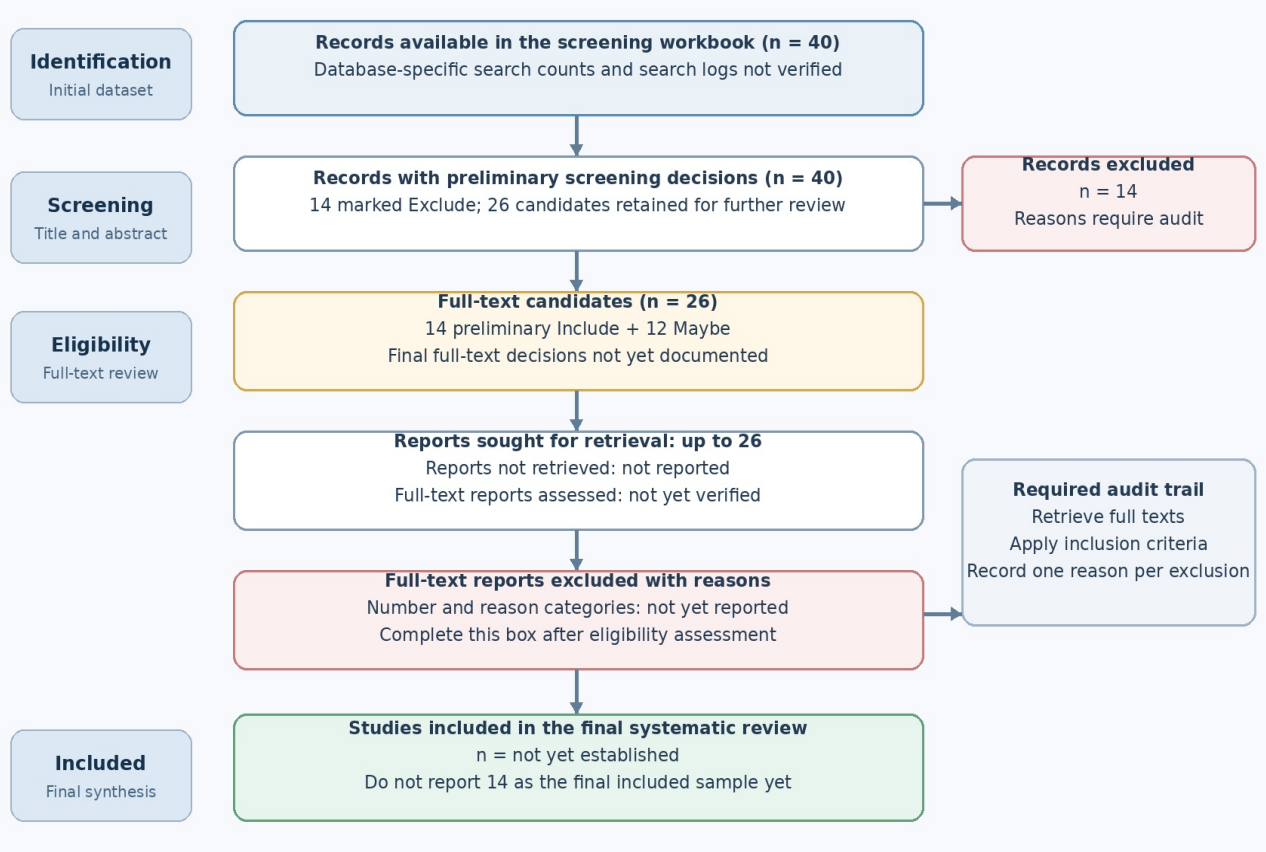

Source: author's creation.

Image 1. Provisional PRISMA-style screening flow.

Eligibility Criteria

Eligible studies are those that substantively connect blockchain or distributed ledger technology with ESG, corporate sustainability, sustainability accounting or reporting, disclosure credibility, accountability, governance, traceability, or corporate ESG performance (Table 2). Empirical studies, conceptual papers, case studies, analytical models, and relevant literature reviews may be considered when they contribute directly to the research questions.

Studies are excluded when blockchain is discussed without a meaningful sustainability connection, ESG is discussed without a substantive blockchain component, or the paper focuses on technical architecture or cryptocurrency activity without implications for corporate sustainability information or governance. Duplicate records, retracted publications, and documents outside the final publication criteria should also be excluded. Studies focusing mainly on ESG performance or market outcomes should be coded separately from studies measuring reporting quality.

Table 2. Eligibility criteria

Dimension	Include	Exclude
Technology	Blockchain or distributed ledger technology	No substantive blockchain/DLT component
Topic	ESG or corporate sustainability with a clear blockchain link	No meaningful ESG/sustainability connection
Reporting/governance	Disclosure, traceability, accountability, auditability, data credibility, or ESG governance	Technical discussion without relevant reporting/governance implications
Performance	Corporate ESG outcomes relevant to the research questions	Unrelated cryptocurrency or market outcomes
Publication	Verifiable eligible journal articles and reviews	Duplicate, retracted, or ineligible document
Language	English if this restriction is adopted consistently	Other languages under an English-only protocol

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Search Strategy and Reproducibility

The original search history is not available in the supplied manuscript materials. Scopus and Web of Science Core Collection are therefore suggested as possible databases for a documented search update, not reported as the verified sources of the 40 existing records. A new search should save the exact search date, database-specific query, filters, number of results, export files, and records obtained through citation searching. The following strings are proposed for testing during a new search. They must not be described as the original executed searches unless they match the researcher's actual search history.

Screening, Data Extraction, and Synthesis

The 14 Include and 12 Maybe records together represent up to 26 candidates for full-text assessment, assuming the categories are mutually exclusive and exhaustive. The final number of included studies cannot yet be determined. The PRISMA flow should be updated with actual records identified per source, duplicates removed, records screened, full-text reports sought and retrieved, full-text exclusions with reasons, and the final included sample.

For each eligible study, data extraction should capture authorship and publication details, research objective, context, unit of analysis, research design, theoretical framework, blockchain application, ESG dimension, measures, principal findings, and limitations. The synthesis uses four provisional themes: sustainability accounting and reporting; ESG disclosure credibility and accountability; corporate ESG performance and adoption; and governance and traceability in sustainable supply chains. These themes may be revised after the full texts are examined.

Methodological appraisal should be appropriate to each design, considering sampling, measurement, analytical transparency, robustness, support for interpretations, and the assumptions underlying conceptual or simulation studies. Because full-text appraisal has not been completed, the present synthesis does not calculate pooled effect sizes or make general causal claims.

RESULTS AND DISCUSSION

Profile of the Candidate Literature

The workbook's 14 Include records cover publications dated 2023 to 2026 and represent a variety of approaches, including quantitative company-level analyses, surveys, qualitative interviews, case studies, decision models, conceptual frameworks, and literature reviews (Table 3). The available metadata suggest that some studies address accounting and reporting directly, while others focus on ESG performance, technology adoption, financial markets, or sustainable supply chains. This diversity broadens the topic but requires careful coding so that unlike outcomes are not treated as equivalent.

Table 3. Overview of selected candidate studies based on the supplied draft

Study	Method/context reported in draft	Main focus
Jeong et al. (2025)	Quantitative; 6,063 firm-year observations	Blockchain adoption and firm ESG performance
Darmawan et al. (2026)	Qualitative; interviews with 18 creative MSME owners/decision-makers	Transparent and sustainable accounting
Wang et al. (2025)	Quantile and frequency-time connectedness analysis	Digital technologies and ESG indices
Bouteraa et al. (2026)	Survey of 409 banking professionals	Blockchain adoption and ESG moderation
Basdekidou & Papapanagos (2024)	DEA approach; 50 firms according to abstract	FinTech/blockchain, ESG and DEI efficiency
Kazachenok et al. (2023)	SEM; 118 countries for 2021–2022 according to abstract	FinTech, blockchain and ESG finance
Biancone et al. (2025)	Single case study, Italian financial consultancy firm	Business strategy and accounting practices
Prados-Castillo et al. (2026)	Bibliometric analysis and meta-analysis; 43 papers according to abstract	Corporate reputation, ESG standards and reporting

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Study	Method/context reported in draft	Main focus
Alsultan et al. (2025)	Market-based decision and sentiment forecasting framework	Timing of ESG-aligned blockchain adoption
Patil et al. (2025)	Structured review and proposed five-layer framework	Blockchain-enabled ESG accounting
Mulligan et al. (2024)	Policy-oriented systematic literature review	Blockchain and sustainability policy
Niu et al. (2024)	Principal–agent model and simulation	Incentives for ESG disclosure
Wahyana et al. (2026)	Multi-case study; 14 projects and 20 interviews according to abstract	Technology providers and sustainable supply chains
Gupta et al. (2026)	Fuzzy Delphi, PCA, and fuzzy DEMATEL	ESG governance in global supply networks

Theme 1: Blockchain for Sustainability Accounting and Reporting

The first theme positions blockchain as an infrastructure that may improve the traceability of accounting records and sustainability information. The candidate studies describe potential benefits such as transparent transactions, verifiable records, and improved coordination of information. These benefits may be relevant where sustainability data are collected across multiple organizational units or supply-chain partners.

For accounting practice, the key issue is whether the full reporting process produces information that is accurate, complete, comparable, and verifiable. Blockchain can help preserve records, but it cannot independently validate the original measurement. Reporting systems still need clear data ownership, source validation, access controls, correction procedures, internal controls, and appropriate independent assurance.

Theme 2: ESG Disclosure Credibility and Accountability

The second theme concerns the incentives and governance arrangements that shape ESG disclosure. Niu et al. (2024) use a principal–agent perspective to propose a mechanism intended to encourage greater effort in producing quality ESG reports. Other candidate work connects blockchain with corporate reputation, verification, and accountability across supply networks.

These contributions suggest that disclosure credibility is not simply a technical property. It emerges from the interaction of source-data quality, measurement standards, incentives, verification, and accountability. Blockchain may document changes to information, but it cannot automatically establish that the initial information is accurate or complete. Consequently, claims about reducing greenwashing require empirical testing.

Theme 3: Corporate ESG Performance and Technology Adoption

Several candidate studies examine the relationship between blockchain adoption and ESG performance or the conditions under which organizations adopt blockchain. These studies provide context on organizational readiness and possible performance associations. Their results should not be interpreted as direct evidence of improved ESG reporting unless the studies explicitly measure reporting quality, disclosure credibility, or a related mechanism.

Causal interpretation also requires caution. Firms with stronger governance, more resources, or a pre-existing commitment to sustainability may be more likely to adopt new technologies. Observed associations may therefore reflect selection effects or other firm characteristics. Future studies should account for endogeneity, reverse causality, and differences in ESG measurement before claiming that blockchain causes improved performance.

Theme 4: Governance and Sustainable Supply Chains

The supply-chain theme highlights the fact that ESG evidence is often distributed across several organizations. Blockchain may provide a shared record for tracing products, transactions, and sustainability-related events, but its effectiveness depends on rules for data entry, access, correction, and responsibility. Technology providers may also influence implementation through training, system updates, and coordination.

Traceability alone does not ensure comparability or assurance. Information becomes useful for ESG reporting when it is linked to consistent indicators, clear measurement rules, and accountability for inaccurate data. This makes governance an essential part of any assessment of blockchain-enabled sustainability reporting.

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Cross-Cutting Research Gaps and Implications

Across the four themes, the central gap is the limited conceptual separation between blockchain's technical capabilities, the quality of information recorded, and substantive sustainability outcomes. Future studies should distinguish the integrity of a record after entry from the validity of source data, and distinguish improved disclosure from actual improvements in environmental or social performance.

The theoretical perspectives in the candidate literature are also varied. Principal–agent reasoning can explain disclosure incentives; stakeholder and institutional perspectives can explain external pressure and legitimacy; technology adoption models can explain readiness; and the resource-based view can explain organizational capabilities. These perspectives can be integrated only when each theory explains a specific mechanism rather than being included as a list of unrelated labels. Table 4 summarizes a suggested future research agenda.

Table 4. Suggested future research agenda

Research area	Example research question	Potential accounting contribution
ESG reporting quality	Does blockchain improve completeness, accuracy, comparability, and verifiability of ESG disclosure?	Connects digital systems with non-financial reporting quality
Source-data validation	How do internal controls and independent assurance validate ESG data before blockchain entry?	Separates record integrity from evidential validity
Greenwashing	Under what conditions does blockchain help detect misleading ESG claims?	Tests rather than assumes anti-greenwashing effects
Theory integration	How do stakeholder pressure, institutional conditions, and organizational capabilities shape adoption and reporting outcomes?	Provides a mechanism-based integrative framework
MSMEs and emerging economies	How do costs, digital literacy, and institutional support shape implementation?	Clarifies boundary conditions and inclusion
Substantive ESG outcomes	Do reporting improvements lead to measurable environmental and social improvements?	Separates information outcomes from sustainability impact

CONCLUSION

This review provides a preliminary map of research connecting blockchain and ESG in corporate sustainability. Four themes emerge from the candidate literature: sustainability accounting and reporting, ESG disclosure credibility and accountability, corporate ESG performance and adoption, and governance in sustainable supply chains. Across these themes, blockchain may support traceability and preserve an audit trail, but these technical features do not by themselves guarantee valid source data, credible disclosure, or improved sustainability outcomes.

The main contribution is to keep reporting quality, governance mechanisms, and substantive ESG performance conceptually distinct while considering how they may influence one another. For accounting research and practice, blockchain should be evaluated as part of a broader system of measurement, internal control, data governance, and assurance, rather than as a substitute for these processes.

The manuscript is not yet a completed systematic review. The supplied workbook reports 40 records, with 14 marked Include, 12 Maybe, and 14 Exclude at the preliminary screening stage. Database search logs, deduplication results, full-text eligibility decisions, exclusion reasons, and quality appraisal remain to be documented. The final sample and PRISMA diagram must be updated after those steps are completed.

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