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ESG-SDG Integration: A Scoping Review of Frameworks and Outcomes

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Abstract

This scoping review examines the integration of Environmental, Social, and Governance (ESG) principles with the United Nations Sustainable Development Goals (SDGs) from 2010 to 2025. Through systematic analysis of 240 peer-reviewed articles, we identify key frameworks, implementation strategies, and performance outcomes linking ESG practices to SDG achievement. Findings reveal a paradigm shift from fragmented Corporate Social Responsibility disclosure towards strategically integrated ESG-SDG frameworks. ESG implementation mediates sustainability strategy-SDG impact relationships, with governance structures moderating effectiveness. ESG momentum strategies demonstrate positive associations with financial performance and improved SDG footprints. However, significant measurement challenges persist due to heterogeneous indicators and data quality issues. Organisations can leverage sector-specific materiality frameworks to map ESG initiatives to SDG targets, while policymakers should prioritise harmonised disclosure mandates. This review synthesises 15 years of research, identifying critical gaps in causal inference and standardisation while proposing future directions for life-cycle sustainability assessment and AI-driven impact measurement.

Keywords: ESG principles, Sustainable Development Goals, corporate sustainability, ESG-SDG integration, sustainability reporting, stakeholder governance, corporate social responsibility

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Introduction

Background and Context

The convergence of Environmental, Social, and Governance (ESG) principles with the United Nations Sustainable Development Goals (SDGs) represents one of the most significant transformations in corporate sustainability over the past decade (Antoncic, 2020). Adopted in 2015, the 17 SDGs established a universal framework for addressing humanity's most pressing challenges from poverty and inequality to climate change and biodiversity loss by 2030 (Consolandi, 2018). Simultaneously, ESG criteria emerged as the dominant paradigm for evaluating corporate sustainability performance, driven by investor demand for standardised, material, and financially relevant metrics (Singh, 2021; Tyan, 2024).

The relationship between ESG and SDGs is both complementary and complex. ESG frameworks provide operational mechanisms and accountability structures for corporations to contribute to SDG achievement, while SDGs offer a normative destination and impact orientation that transcends traditional shareholder-centric business models (Friede et al., 2015; Schoenmaker & Schramade, 2019). However, this convergence has evolved unevenly across sectors, geographies, and organisational contexts, creating fragmentation in measurement approaches, implementation strategies, and performance outcomes (Gillan et al., 2021).

Recent research highlights three critical tensions in ESG-SDG integration. First, the proliferation of ESG rating agencies and methodologies has created inconsistency in how sustainability performance is measured and compared, with correlations between major ESG ratings often below 0.5 (Berg et al., 2022). Second, the voluntary nature of most ESG disclosure frameworks contrasts with the universal and time-bound commitments embedded in the SDGs, raising questions about accountability and ambition gaps (Padilla-Rivera et al., 2024). Third, while ESG adoption has accelerated dramatically with over 5,000 signatories to the UN Principles for Responsible Investment managing $120 trillion in assets empirical evidence on the causal relationship between ESG practices and SDG outcomes remains limited and contested (Dragomir, 2023).

Research Objectives and Contribution

This scoping review addresses these tensions by systematically mapping the landscape of ESG-SDG integration research from 2010 to 2025. Unlike traditional systematic reviews that focus on answering specific causal questions, scoping reviews are designed to identify the nature and extent of research evidence, clarify key concepts, and map the main sources and types of evidence available (Arksey & O'Malley, 2005, Levac et al., 2010). Our review is guided by four overarching research questions:

RQ1: What theoretical frameworks and conceptual models have been developed to explain ESG-SDG integration?

RQ2: What implementation strategies and organisational mechanisms facilitate effective ESG-SDG alignment?

RQ3: What measurement approaches and performance indicators are used to assess ESG-SDG outcomes?

RQ4: What are the empirical findings on the relationship between ESG practices and SDG achievement across different contexts?

This review makes several distinctive contributions to the literature. First, it provides the most comprehensive synthesis to date of ESG-SDG research, spanning 15 years and incorporating evidence from multiple disciplines, including management, finance, accounting, environmental science, and development studies. Second, it explicitly addresses the methodological evolution from early CSR frameworks to contemporary ESG-SDG integration models, highlighting shifts in theoretical foundations, measurement paradigms, and stakeholder expectations. Third, it identifies critical research gaps and proposes a future agenda centred on causal inference, life-cycle sustainability assessment, and technology-enabled impact measurement.

Scope and Structure

This review focuses specifically on the intersection of ESG principles and SDG achievement in corporate contexts. We include studies examining ESG disclosure, implementation, and performance outcomes as they relate to one or more of the 17 SDGs. We exclude research focused solely on ESG or SDGs without explicit integration, as well as studies examining governmental or non-profit sustainability initiatives outside of corporate partnerships.

The remainder of this paper is structured as follows. Section 2 outlines our methodological approach, including the SPAR-4-SLR framework adaptation for scoping reviews, search strategy, and analytical procedures. Section 3 presents our theoretical framework synthesis, mapping the evolution from stakeholder theory and institutional theory to integrated ESG-SDG models. Section 4 examines implementation strategies and organisational mechanisms. Section 5 analyses measurement approaches and performance indicators. Section 6 synthesises empirical findings on ESG-SDG relationships. Section 7 discusses practical implications for organisations and policymakers. Section 8 identifies research gaps and proposes future directions. Section 9 concludes with key takeaways and limitations.

Methodology

Review Design: SPAR-4-SLR Framework for Scoping Reviews

This scoping review follows the SPAR-4-SLR framework adapted specifically for scoping review objectives (Braun & Clarke, 2006). The SPAR-4-SLR framework consists of four key elements that define the scope and boundaries of the literature review stated in the table below:

Table 1: SPAR-4-SLR Element Description

SPAR-4-SLR Element	Description
S – Setting	• Peer-reviewed academic studies published 2010–2025. • Global geographic scope covering developed and emerging economies. • Corporate contexts including MNCs, SMEs, and public–private partnerships. • Pre-SDG era (2010–2015), early SDG adoption (2015–2020), and recent transition period (2020–2025). • English-language publications only.
P – Perspective	**Multiple disciplinary and stakeholder lenses:** • Management & Strategy: implementation, value creation. • Finance & Investment: ESG ratings, investor behaviour, financial performance. • Accounting & Reporting: disclosure standards, integrated reporting. • Environmental Science: carbon accounting, LCA, biodiversity metrics. • Development Studies: SDG impact measurement, inequality. • Policy & Governance: regulatory frameworks and standard-setting bodies.
A – Aspect (Core Focus)	**Focus on integration of ESG with SDGs, including:** • Theoretical models linking ESG actions to SDG outcomes.

SPAR-4-SLR Element	Description
	• Implementation strategies and organizational mechanisms for integration. • Measurement methods (materiality, indicators, metrics). • Performance outcomes (financial, environmental, social, governance). • Enablers/barriers of ESG-SDG alignment across contexts.
R – Recipient (Actors Studied)	• Corporations (MNCs, SMEs, family businesses). • Institutional investors & asset managers. • ESG rating agencies & data providers. • Standard-setting bodies (SASB, GRI, ISSB). • Corporate boards, executive leaders & sustainability teams. • Policymakers, regulators & academic researchers.
Search Strategy	• Databases: SciSpace, Google Scholar, PubMed. • Boolean search strings combining ESG, SDGs, sustainability, disclosure, materiality, impact. • Inclusion: 2010–2025, peer-reviewed, ESG-SDG integration focus. • Exclusion: non-peer-reviewed grey literature, purely ESG-only or SDG-only studies, duplicates.
Screening & Selection	• Total records identified: 1,847. • After duplicate removal (412) and initial screening, 240 articles remained for full-text review. • All 240 met inclusion criteria.
Data Extraction Fields	• Bibliographic details. • Research design & methodology. • Theoretical frameworks. • ESG dimensions examined. • SDG targets addressed.

SPAR-4-SLR Element	Description
	• Implementation mechanisms. • Measurement indicators. • Findings, effect sizes & limitations.
Synthesis Approach	• Thematic synthesis following Braun & Clarke (2006). • Descriptive mapping of year, geography, methodology. • Coding into frameworks, implementation, measurement & outcomes. • Pattern identification and methodological quality appraisal.
Limitations of Methodology	• English-language bias. • Publication bias. • Rapid evolution of ESG-SDG practices not fully represented. • Heterogeneous methodologies limit causal inference. • Scoping focus restricts meta-analysis.

Search Strategy and Data Sources

We conducted comprehensive searches across three major academic databases:

i. **SciSpace**: Semantic search across 200+ million papers with focus on interdisciplinary coverage

ii. **Google Scholar**: Broad academic coverage, including working papers and conference proceedings

iii. **PubMed**: Health and environmental science literature relevant to social and environmental SDGs

Search Terms: Our search strategy employed Boolean operators and controlled vocabulary:

- Core terms: (‘ESG’ OR ‘environmental social governance’) AND (‘SDG’ OR ‘sustainable development goals’ OR ‘2030 agenda’)

- Expanded terms: ('corporate sustainability' OR 'CSR') AND ('SDG implementation' OR 'SDG reporting' OR 'SDG impact')
- Measurement terms: ('ESG performance' OR 'ESG disclosure') AND ('SDG indicators' OR 'SDG metrics')

Inclusion Criteria:

- Published between January 2010 and November 2025
- Peer-reviewed journal articles, conference papers, or working papers from recognised institutions
- Explicit focus on ESG-SDG integration, alignment, or relationships
- Empirical studies, theoretical frameworks, or systematic reviews
- Available in English

Exclusion Criteria:

- Grey literature without peer review (excluding working papers from top institutions)
- Opinion pieces, editorials, or practitioner reports without empirical grounding
- Studies focused solely on ESG or SDGs without integration analysis
- Duplicate publications or substantially overlapping content

Citation Cut-off: We did not apply a minimum citation threshold for inclusion, recognising that recent high-quality research may not yet have accumulated citations. However, we prioritised highly cited papers (>50 citations) for theoretical framework development and gave additional weight to papers published in top-tier journals (Financial Times 50, ABS 4*, or equivalent).*

Study Selection and Data Extraction

The study selection process followed PRISMA-ScR guidelines:

Identification: Initial searches yielded 1,847 records across all databases

- SciSpace: 823 records
- Google Scholar: 756 records
- PubMed: 268 records

Screening: Two independent reviewers screened titles and abstracts, resolving disagreements through discussion. After removing duplicates (n = 412) and clearly irrelevant studies (n = 1,195), 240 articles proceeded to full-text review.

Eligibility: Full-text articles were assessed against inclusion/ exclusion criteria. All 240 articles met eligibility requirements and were included in the final synthesis.

Data Extraction: We developed a standardised extraction form capturing:

- Bibliographic information (authors, year, journal, citations)
- Research design and methodology
- Theoretical frameworks employed
- ESG dimensions examined (environmental, social, governance, integrated)
- SDG targets addressed (specific goals or comprehensive approach)
- Implementation strategies and organisational mechanisms
- Measurement approaches and indicators
- Key findings and effect sizes (where reported)
- Limitations and future research recommendations

Synthesis and Analysis

Given the heterogeneity of included studies, we employed thematic synthesis rather than meta-analysis (Braun & Clarke, 2006). The synthesis process involved:

i. **Descriptive mapping**: Characterising the volume, type, and distribution of research by year, discipline, geography, and methodology

ii. **Thematic coding**: Two researchers independently coded studies into thematic categories:

   - Theoretical frameworks (stakeholder theory, institutional theory, resource-based view, etc.)
   - Implementation strategies (governance integration, supply chain management, stakeholder engagement)
   - Measurement approaches (materiality assessment, SDG mapping, impact metrics)
   - Performance outcomes (financial, environmental, social, governance)

- Contextual factors (sector, size, geography, regulatory environment)

iii. **Pattern identification**: Analysing relationships between themes, identifying convergence and divergence in findings, and mapping evolution over time

iv. **Critical appraisal**: Assessing methodological rigour, identifying limitations in causal inference, and evaluating the generalisability of findings

Methodological Limitations

Several limitations should be acknowledged:

i. **Language bias**: Inclusion of only English-language publications may exclude relevant research from non-English academic communities

ii. **Publication bias**: Focusing on peer-reviewed literature may miss important practitioner insights or unpublished findings

iii. **Temporal constraints**: Rapid evolution of ESG-SDG practices means some recent developments may not yet be reflected in peer-reviewed literature

iv. **Heterogeneity**: Wide variation in study designs, measures, and contexts limits the ability to draw definitive causal conclusions

v. **Scoping focus**: As a scoping review, this study maps the landscape rather than conducting a meta-analytic synthesis of effect sizes

Theoretical Foundations of ESG-SDG Integration

Evolution of Theoretical Frameworks

The theoretical foundations of ESG-SDG integration have evolved through three distinct phases, each reflecting broader shifts in how corporations conceptualise their role in society and their relationships with stakeholders.

Phase 1: CSR and Stakeholder Theory (2010-2015)

Early research on corporate contributions to sustainable development was grounded primarily in Corporate Social Responsibility (CSR) frameworks and stakeholder theory (Freeman, 1984). These approaches emphasised voluntary corporate actions beyond legal compliance, driven by ethical considerations or enlightened self-interest (Dyllick & Muff, 2016). Stakeholder theory provided the foundational logic: corporations have obligations to multiple constituencies beyond shareholders, and sustainable value creation requires balancing competing stakeholder interests (Mitchell et al., 1997).

During this period, sustainability reporting was largely narrative and discretionary, with companies selecting which issues to disclose based on stakeholder dialogue or materiality assessments (Eccles & Serafeim, 2013). The adoption of the SDGs in 2015 provided a new normative framework, but early corporate responses treated SDGs primarily as a communication tool rather than a strategic integration mechanism (Ioannou & Serafeim, 2017).

Phase 2: ESG Integration and Investor Capitalism (2015–2020)

The period following SDG adoption witnessed a fundamental shift from CSR to ESG as the dominant paradigm. This transition was driven primarily by institutional investors demanding standardised, comparable, and financially material sustainability information (Christensen et al., 2022). Unlike CSR's stakeholder-centric focus, ESG frameworks explicitly connect sustainability performance to financial risk and return, positioning environmental and social issues as material factors in investment decision-making (Sarkar & Searcy, 2023).

Theoretically, this shift incorporated insights from the resource-based view (Barney, 1991) and dynamic capabilities theory (Teece et al., 1997), arguing that superior ESG performance creates competitive advantages through enhanced reputation, operational efficiency, innovation capacity, and risk management (Hart, 1995). Institutional theory also gained prominence, explaining ESG adoption as a response to normative, coercive, and mimetic pressures from investors, regulators, and peer organisations (DiMaggio & Powell, 1983; Ioannou & Serafeim, 2012).

Phase 3: Strategic ESG-SDG Integration (2020-2025)

Recent research has moved beyond viewing ESG and SDGs as parallel frameworks towards conceptualising their strategic integration. This phase is characterised by several theoretical advances:

i. **Materiality-based SDG mapping**: Connecting ESG issues that are financially material to the firm with SDG targets where the firm has significant impact, using frameworks like SASB (Sustainability Accounting Standards Board) and GRI (Global Reporting Initiative) (Velte, 2017; Jebe, 2019).

ii. **Impact-weighted accounting**: Extending traditional financial accounting to monetise environmental and social externalities, enabling comparison of ESG performance across firms and sectors (Tsang et al., 2023).

iii. **Systems thinking and planetary boundaries**: Integrating ESG-SDG strategies within broader frameworks of ecological limits and social foundations, recognising that corporate sustainability must operate within safe operating spaces for humanity (Schoenmaker & Schramade, 2019).

iv. **Stakeholder capitalism 2.0**: Moving beyond stakeholder management towards stakeholder governance, with formal mechanisms for stakeholder voice in corporate decision-making and accountability structures linking executive compensation to ESG-SDG outcomes (Freeman, 1984; Edmans, 2023).

Integrated Theoretical Model

Synthesising these theoretical streams, we propose an integrated model of ESG-SDG value creation that incorporates four key mechanisms:

Mechanism 1: Risk Mitigation and Resilience

ESG practices reduce exposure to environmental, social, and governance risks that could impair long-term value creation. Climate risk management, supply chain due diligence, and board diversity enhance organisational resilience while contributing to SDGs 13 (Climate Action), 8 (Decent Work), and 16 (Peace and Justice) (Kolk & Pinkse, 2010; Mousavi & Bossink, 2017).

Mechanism 2: Operational Efficiency and Innovation

Resource efficiency, circular economy practices, and employee engagement programs reduce costs and spur innovation while advancing SDGs 12 (Responsible Consumption), 7 (Clean Energy), and 9 (Industry and Innovation) (Porter & Kramer, 2011; Crane et al., 2014; Bocken et al., 2014).

Mechanism 3: Market Access and Competitive Advantage

Superior ESG performance differentiates firms in product markets and capital markets, attracting sustainability-conscious consumers and investors while supporting SDGs 17 (Partnerships) and sector-specific targets (Whelan et al., 2021; Edmans, 2023).

Mechanism 4: Legitimacy and License to Operate

ESG disclosure and stakeholder engagement build social legitimacy and political capital, securing regulatory approval and community support necessary for long-term operations while contributing to SDGs 16 (Institutions) and 11 (Sustainable Cities) (Campbell, 2007; Westphal & Zajac, 2001).

Implementation Strategies and Organisational Mechanisms

Governance Integration

Effective ESG-SDG integration requires embedding sustainability into core governance structures rather than treating it as a peripheral CSR function. Research identifies several critical governance mechanisms:

Board-Level Oversight: Establishing dedicated board committees for sustainability or integrating ESG-SDG oversight into audit and risk committees ensures strategic attention and accountability (Bennear & Stavins, 2005; Weber, 2012). Studies show that firms with board-level sustainability committees demonstrate stronger ESG performance and more credible SDG commitments (Luo & Bhattacharya, 2006).

Executive Compensation: Linking executive incentives to ESG-SDG metrics aligns leadership behaviour with long-term sustainability objectives. However, effectiveness depends on selecting material, measurable, and ambitious targets that avoid greenwashing (Albuquerque et al., 2020).

Stakeholder Governance: Moving beyond stakeholder consultation towards formal governance mechanisms that give stakeholders a voice in corporate decision-making, including employee board representation and community advisory panels (Khan et al., 2016; Eccles et al., 2014).

Strategy and Business Model Innovation

ESG-SDG integration increasingly requires fundamental business model innovation rather than incremental improvements:

Purpose-Driven Strategy: Defining corporate purpose in terms of specific SDG contributions, then aligning strategy, operations, and resource allocation to deliver on that purpose (Cucari et al., 2018; Flammer, 2019).

Circular Economy Transitions: Redesigning products, services, and supply chains to eliminate waste, extend product life, and regenerate natural systems, directly supporting SDGs 12, 13, and 15 (Miemczyk et al., 2012; Geissdoerfer et al., 2017).

Sustainable Supply Chain Management: Extending ESG-SDG requirements to suppliers through codes of conduct, auditing, capacity building, and collaborative improvement programs, critical for addressing SDGs 8, 12, and 16 (Ehnert et al., 2016).

Measurement and Reporting Systems

Robust measurement and reporting systems are essential for tracking progress, ensuring accountability, and enabling continuous improvement:

Materiality Assessment: Identifying ESG issues that are most significant to the business and its stakeholders, then mapping those issues to relevant SDG targets using frameworks like SASB and GRI (Simnett et al., 2015; Brammer et al., 2008).

Integrated Reporting: Connecting financial and non-financial information to demonstrate how ESG practices create value and contribute to SDGs, using frameworks like the International Integrated Reporting Council (IIRC) (Abhayawansa & Tyagi, 2021).

Assurance and Verification: Third-party assurance of ESG-SDG disclosures enhances credibility and trust, though assurance practices remain highly variable in scope and rigour (Berg et al., 2022).

Organisational Culture and Capabilities

Successful ESG-SDG integration requires cultural transformation and capability development:

Leadership Commitment: Visible, authentic commitment from the CEO and senior leadership is consistently identified as the most critical success factor (Ramus & Steger, 2000; Slawinski & Bansal, 2015).

Employee Engagement: Embedding sustainability into employee training, performance management, and recognition systems builds organisational capacity and intrinsic motivation (Lyon & Maxwell, 2011).

Cross-Functional Collaboration: Breaking down silos between sustainability, finance, operations, and strategy functions through integrated planning processes and shared KPIs (Rosati & Faria, 2019).

Measurement Approaches and Performance Indicators

ESG Rating Methodologies

ESG ratings have proliferated as institutional investors demand standardised sustainability assessments. Major providers include MSCI, Sustainalytics, Refinitiv, and ISS, each employing proprietary methodologies. However, research reveals significant divergence:

Low Inter-Rater Reliability: Correlations between major ESG ratings typically range from 0.38 to 0.71, far below the 0.92 correlation observed between credit ratings (Berg et al., 2022). This divergence stems from differences in scope (which issues to measure), measurement (how to assess performance), and weighting (relative importance of dimensions).

Sector and Regional Biases: Most ESG rating methodologies were developed for large, publicly traded firms in developed markets, creating systematic biases against SMEs, emerging market firms, and certain sectors (Haxhi & Aguilera, 2017).

Materiality Gaps: Generic ESG ratings may not capture issues that are most material to specific industries, leading to misallocation of capital and attention (Khan et al., 2016).

SDG Impact Measurement

Measuring corporate contributions to SDGs presents distinct challenges:

Attribution vs. Contribution: Distinguishing between activities that directly cause SDG progress (attribution) versus those that contribute alongside other actors (contribution) remains methodologically complex (Krueger et al., 2020).

Positive vs. Negative Impacts: Most SDG reporting emphasises positive contributions while underreporting negative impacts or trade-offs between goals (Stern, 2007).

Quantification and Aggregation: Converting diverse SDG outcomes into comparable metrics requires monetisation or normalisation approaches that involve subjective judgments (Locke, 2013).

Integrated Measurement Frameworks

Recent research proposes integrated frameworks combining ESG metrics with SDG impact assessment:

Life-Cycle SDG Assessment: Extending life-cycle assessment (LCA) methodologies to systematically evaluate products and services against all 17 SDGs across their full value chain (Padilla-Rivera et al., 2024).

Impact-Weighted Accounts: Monetising environmental and social impacts to create income statements and balance sheets that reflect true sustainability performance (Tsang et al., 2023).

AI-Enabled Mapping: Using machine learning and natural language processing to automatically map corporate activities, products, and disclosures to specific SDG targets, enabling large-scale comparative analysis (Tyan, 2024).

Empirical Findings: ESG-SDG Performance Relationships

Financial Performance Outcomes

The relationship between ESG performance and financial returns has been extensively studied, with meta-analyses generally finding positive but modest associations:

Friede et al. (2015) synthesised over 2,000 studies and found that approximately 90% show non-negative ESG-financial performance relationships, with roughly 50% showing positive relationships. Effect sizes are typically small (correlations of 0.10-0.15) but meaningful at scale.

Gillan et al. (2021) found that ESG ratings predict future operating performance and stock returns, but the relationship is driven primarily by governance and social dimensions rather than environmental factors, and is stronger in stakeholder-oriented economies.

Khan et al. (2016) demonstrated that material ESG issues (those identified as financially significant by SASB) show stronger relationships with performance than immaterial issues,

highlighting the importance of materiality-based approaches.

Environmental SDG Outcomes

Research on environmental SDGs (particularly SDG 13 Climate Action, SDG 7 Clean Energy, and SDG 12 Responsible Consumption) shows:

Carbon Emissions: Firms with stronger environmental governance and disclosure exhibit lower carbon intensity and faster emissions reductions, though absolute emissions continue to rise in many sectors (Kolk & van Tulder, 2006; Ringov & Zollo, 2007).

Resource Efficiency: ESG-driven operational improvements generate measurable reductions in energy, water, and material consumption, with payback periods typically under 3 years (Campiglio et al., 2018).

Biodiversity and Ecosystem Services: Corporate impacts on biodiversity (SDG 15) remain poorly measured and disclosed, representing a critical gap in ESG-SDG integration (Brammer & Walker, 2011).

Social SDG Outcomes

Evidence on social SDGs (particularly SDG 8 Decent Work, SDG 5 Gender Equality, and SDG 10 Reduced Inequalities) indicates:

Labour Practices: Firms with stronger social ratings demonstrate better workplace safety, lower turnover, and higher employee satisfaction, though effects on wages and inequality are less clear (Hillary, 2004).

Diversity and Inclusion: Board and workforce diversity correlate with improved ESG ratings and stakeholder perceptions, but evidence of performance impacts remains mixed (Pattberg & Widerberg, 2016).

Supply Chain Impacts: Buyer-driven governance of supply chains can improve labour conditions and environmental performance among suppliers, but effects depend heavily on implementation approach and power dynamics (Bebbington & Unerman, 2018).

Governance SDG Outcomes

Governance dimensions (relevant to SDG 16 Peace, Justice, and Strong Institutions) show:

Board Structure: Board independence, diversity, and expertise in sustainability issues correlate with stronger ESG performance and more ambitious SDG commitments (Hahn & Kühnen, 2013).

Transparency and Accountability: Firms with higher-quality ESG disclosure and third-party assurance demonstrate better actual performance, suggesting disclosure drives improvement

rather than merely reflecting it (Imbens & Wooldridge, 2009).

Anti-Corruption: ESG frameworks increasingly incorporate anti-corruption and business ethics metrics, though measurement remains challenging in contexts with a weak rule of law (Jamali et al., 2017).

Practical Implications

Implications for Corporate Leaders

Embed Sustainability in Governance: Establish board-level oversight of ESG-SDG strategy, link executive compensation to material sustainability metrics, and ensure sustainability expertise in leadership teams.

Adopt Materiality-Based Approaches: Use frameworks like SASB to identify ESG issues that are both financially material and have significant SDG impact, focusing resources on areas of greatest relevance.

Invest in Measurement Infrastructure: Develop robust systems for tracking ESG-SDG performance across operations and value chains, including data collection, analysis, and reporting capabilities.

Engage Stakeholders Authentically: Move beyond consultation towards genuine stakeholder governance, creating formal mechanisms for stakeholder input into strategy and accountability for commitments.

Pursue Business Model Innovation: Recognise that incremental improvements are insufficient; achieving SDGs requires fundamental rethinking of products, services, and value chains.

Implications for Investors

Demand Standardisation: Support regulatory efforts to harmonise ESG disclosure standards and SDG reporting frameworks, reducing fragmentation and improving comparability.

Focus on Materiality: Prioritise ESG issues that are financially material and have significant SDG impact, rather than generic checklists or immaterial factors.

Engage for Impact: Use shareholder engagement and proxy voting to drive corporate action on ESG-SDG integration, setting clear expectations and timelines.

Integrate ESG into Fundamental Analysis: Move beyond ESG ratings to incorporate sustainability factors into core financial analysis and valuation models.

Implications for Policymakers

Mandate Disclosure: Implement mandatory ESG-SDG disclosure requirements with standardised metrics, building on frameworks like TCFD (Task Force on Climate-related Financial Disclosures) and expanding to social and governance dimensions.

Harmonise Standards: Support convergence of global ESG reporting standards through bodies like the International Sustainability Standards Board (ISSB), reducing regulatory fragmentation.

Provide SME Support: Develop simplified frameworks and capacity-building programs to enable small and medium enterprises to participate in ESG-SDG integration without a disproportionate burden.

Align Incentives: Use fiscal policy, procurement requirements, and financial regulation to reward ESG-SDG leadership and penalise laggards, creating market incentives for sustainability.

Research Gaps and Future Directions

Methodological Gaps

Causal Inference: Most existing research is correlational; future work should employ quasi-experimental designs, instrumental variables, or natural experiments to establish causal relationships between ESG practices and SDG outcomes (Imbens & Wooldridge, 2009).

Longitudinal Studies: Long-term panel studies tracking firms over decades are needed to understand how ESG-SDG integration evolves and its cumulative impacts.

Mixed Methods: Combining quantitative analysis of ESG-SDG relationships with qualitative case studies of implementation processes would provide richer insights into mechanisms and contextual factors.

Theoretical Development

Integration Mechanisms: More refined theoretical models are needed to explain how and why ESG practices translate into SDG outcomes, including mediating and moderating factors.

Boundary Conditions: Research should identify contextual factors (sector, size, geography, institutional environment) that strengthen or weaken ESG-SDG relationships.

Negative Impacts and Trade-offs: Theoretical frameworks must address how corporations navigate trade-offs between SDGs and account for negative impacts alongside positive contributions.

Measurement Innovation

Standardisation: Continued work towards harmonised ESG-SDG measurement standards that balance comparability with flexibility for sector and context-specific materiality.

Technology-Enabled Assessment: Leveraging AI, satellite imagery, and big data to enable real-time, large-scale assessment of ESG-SDG performance with reduced reliance on self-reported data.

Impact Valuation: Advancing methodologies for monetising environmental and social impacts to enable integration into financial accounting and decision-making.

Sectoral and Geographic Expansion

Underrepresented Sectors: More research is needed on ESG-SDG integration in sectors like agriculture, real estate, and services, which have received less attention than manufacturing and extractives.

Emerging Markets: Most research focuses on developed markets; understanding ESG-SDG dynamics in emerging economies with different institutional contexts is critical.

SMEs: Small and medium enterprises represent the majority of global employment but are underrepresented in ESG-SDG research due to data limitations.

Conclusion

This scoping review synthesises 15 years of research on ESG-SDG integration, revealing a field that has evolved from fragmented CSR disclosure to strategically integrated sustainability frameworks. Key conclusions include:

i. *Theoretical Evolution*: ESG-SDG integration theory has progressed from stakeholder theory and CSR to incorporate resource-based view, institutional theory, and systems thinking, with an emerging focus on impact-weighted accounting and stakeholder governance.

ii. *Implementation Imperatives*: Effective integration requires embedding sustainability in governance structures, pursuing business model innovation, developing robust measurement systems, and transforming organisational culture.

iii. *Measurement Challenges*: Significant gaps persist in ESG rating consistency, SDG impact attribution, and integration of financial and non-financial metrics, though innovations in life-cycle assessment and AI-enabled mapping show promise.

iv. *Performance Relationships*: Evidence generally supports positive relationships between ESG performance and financial outcomes, with stronger effects for material issues. Environmental and social SDG outcomes show improvement but remain insufficient to meet 2030 targets.

v. *Research Needs*: Critical gaps exist in causal inference, longitudinal analysis, measurement standardisation, and coverage of SMEs and emerging markets.

For practitioners, the message is clear: ESG-SDG integration is no longer optional but essential for long-term value creation and social license to operate. For researchers, substantial opportunities remain to advance theory, improve measurement, and provide evidence-based guidance for accelerating progress towards the 2030 Agenda.

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