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Organizational Capabilities in ESG Strategy: Mapping the Black Box of Performance Translation

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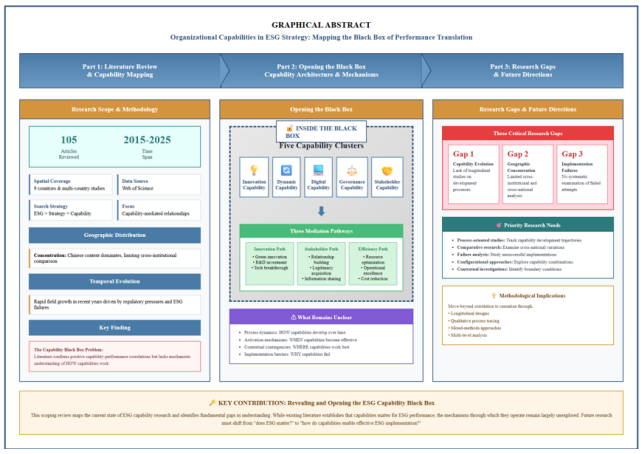
Graphical abstract



Abstract

The current state of organizational capabilities within the field of environmental, social, and governance (ESG) strategy is specified in this scoping review, in order to fuel the process of identifying significant gaps in the area of knowledge. The literature focus is observed to be grounded on five kinds of capabilities (innovation, dynamic, digital, governance and stakeholder) and their positive correlation with the ESG performance after conducting a review of 105 articles (2015-2025). Such capabilities operate in the ways of utilization of resources more efficiently and the coordination of stakeholders in a better way. Three major gaps were identified, such as limited knowledge regarding the development of capabilities and processes, excessive dependence on the Chinese context (41.9% of papers) that limits inter-institutional comparison, and no focus on the failures in implementation. The role of asking the complex question of how and why of capability building in the field is shrouded in the focus on quantifiable, correlation studies. This review recommends longitudinal, cross-national comparative and process-oriented studies on such neglected areas. It aims at charting a path towards the demystification of the black box of the ability in ESG practice.

Keywords: ESG implementation, organizational capabilities, capability development, process mechanisms, sustainability strategy, scoping review

JEL code: M14, Q56, L25

1. Introduction

Suppose there are two companies in manufacturing sector with similar assignment of carbon neutrality. The two have common resources and share the same regulatory burden, but their results are starkly contrasting. The first commits massive resources to develop renewable infrastructure but becomes heavily dependent on this while it finds it difficult to fulfill targets due to stakeholder criticisms. The second recognizes industry best practice by operation efficiency built on green innovation integration, stakeholder relationship development and improved dynamic sensing. This demonstrates the difficulty of tying ESG strategy to real-world effects.

The association between organizational capabilities and ESG performance has been well covered in the literature. Different research reports indicate the positive relationship between certain capabilities and ESG performance (e.g., Chen *et al.*, 2023; and, Jiang *et al.*, 2025). However, as much as this has been illustrated that middle management capabilities lead to firm performance enhancement in the literature, the linkages are not quite clear. This is the “capability black box” of ESG practices.

This conundrum generates challenges both theoretically and practically. Abbas *et al.* (2025) identify that organizations face increasing pressures due to resource depletion, climate change, and stakeholders demands for adopting eco-friendly practices. Developing capabilities may not be enough in the absence of well-defined deployment mechanisms. Deng and Karia (2025) argue that, given the current market, organizations are under increasing pressure to respond to a more dynamic and

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volatile market. The complexity of the environment increases the need for more defined frameworks.

ESG situations create complexities not seen in other capability frameworks. Integrating ESG involves merging sometimes conflicting objectives between the environmental, social and governance dimensions. Cormier *et al.* (2024) demonstrate that the impact of board diversity on CSR performance is not homogeneous across the environmental and social dimensions, and that capability effects are contingent upon the ESG domain. Cichosz *et al.* (2025) stress that sustainability transformation is not about creating optimal designs but instead involves the ongoing balancing of organizational tensions.

The plight of digital transformation is one such example of these implementation complexities. Cheng and Li (2025) show that ESG performance amplifies digital transformation and Wang and Zhang (2025) offers evidence of how artificial intelligence supply chains contribute to innovation and collaboration capabilties which in turn affects ESG performance. These reciprocal relations form loops of feedback that render problematic, linear capacity-performance models.

The present study indicates the need to cope with failures and contextual diversity. Song *et al.* (2024) find inverse associations of guarantor network intensity with ESG performance in Chinese companies indicating not all capability investments result in a positive ESG effects. Brunet *et al.* (2025) note resistance of society to infrastructure projects and variability in capability-performance relationships depending on context.

Such geographical concentration restricts the theoretical mapping. Chinese research contributes to understanding state-run forms of sustainability mechanisms (Long *et al.* 2023, Jiang *et al.* 2025), although questions persist about generalizability to the developed markets with a market-driven economic orientation and different institutional contexts. This limitation confines our understanding of ESG capability development across different governance systems.

This research investigates how organizational capabilities influence the ESG strategy-performance relationship and which organizational factors are relevant to successful and failed capability development. We review the mechanisms of capability in ESG integration and critical research gaps from an analysis of 105 empirical papers. This capability-based approach reconceptualizes ESG from a compliance task to a strategic development challenge, reorienting our attention from whether ESG counts to how capabilities foster the effective implementation of ESG.

2. Methodology

We started with extensive search strategies intended to capture the overlap between ESG strategy implementation and organizational capabilities literature. The search of Web of Science for “ESG” generated 12,932 hits—too scattered to allow focused examination of capability mechanisms. The inclusion of “Strategy” narrowed the results to 1,090 papers but was still a broad search as it failed to focus on capability-mediated relationships. The last search string “ESG + Strategy + Capability” retrieved 119 papers, which constituted the start corpus for meticulous inspection on May 30th, 2025.

2.1. Search Strategy and Selection Criteria

Web of science core collection was searched with the following search expression: TOPIC = (ESG or environmental social governance or environmental, social and governance or sustainability) and TOPIC = (capability or capabilities or organizational capability) and TOPIC = strategy or strategic performance. The restriction was based on the articles that were published in English in 2015-2025. Articles and reviews are the only types of documents that were restricted. No prohibitions were made in reference to the subject areas to ensure that everybody is covered.

To refer to the potentially relevant studies, the screening was done in three steps that included: (1) Title screening: The two reviewers screened the entire titles (n=243) individually. (2) Abstract screening: On inclusion criteria, full abstracts of retained titles (n=156) were screened. (3) Full-text screening: Entire articles (n=119) were considered as far as eligibility was concerned. There was also a high inter-rater agreement (Cohen kappa = 0.87). The disputes were resolved through deliberation and the third reviewer was sought in case of necessity. At this stage, fourteen articles that were not specifically addressing the question of capability-mediated ESG implementation were narrowed.

Even though scoping reviews are not typically linked to formal quality appraisal, to investigate the soundness of the methodology, we: (1) assessed the explicitness of research design and methods, (2) judged the appropriateness of analytical methods to research questions, (3) assessed the transparency of data sources and sampling, and (4) judged the logical consistency between the findings and inferences. Studies that met these requirements were considered as final sample (n=105).

This approach has limitations. Papers that employ alternative terminology (e.g., “capabilities” or “dynamic capabilities”) but not including the word, “capability,” might have been overlooked and thereby miss out on relevant research defining organizational capability in different ways. This emphasis on Web of Science guaranteed the quality through stringent indexing but might have contributed to excluding practitioner journals or regional publications which addressed challenges in a more direct way. Furthermore, the limitation to English language limited the focus even taking into account that ESG is implemented worldwide and that there are a lot of Chinese research.

We selected peer-reviewed articles investigating how organizations function in ESG environments, and studying the links between capabilities, strategies, and performance. Peer-reviewed English language articles published 2015-2025 on ESG were included. All titles were

screened by two reviewers independently with high agreement. Any disagreement was discussed and remaining disputes were settled by a third reviewer. Fourteen papers not referring to capability-mediated implementation of ESG were excluded. Studies reporting ESG-competence were 105 for the subsequent sample (**Figure 1**).

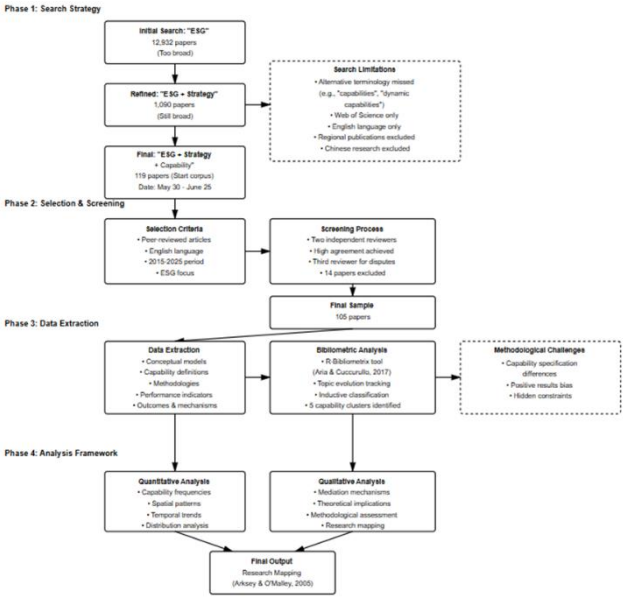

Figure 1. Scoping Review Methodological Flowchart

2.2. Data Extraction and Analysis

We reviewed conceptual models, definitions of capability, methodologies employed, performance indicators, outcomes and mediating mechanisms. We evaluated them based on theoretical underpinning, methodological soundness, empirical support and contributions to the understanding of capability dynamics.

We performed bibliometric analysis using R-Bibliometrix (Aria & Cuccurullo, 2017) to follow ideas and evolving topics. During this investigation two methodological hindrances became evident and they called for modifications. Differences in specification of capacity across studies was one limitation. Using inductive classification, we tackled this issue and detected 5 capability clusters. Another barrier was the dominance of positive results that overshadowed problems. We did this by exploring any methodological constraints and circumstances that were referred to but not highlighted in the paper.

2.3. Analytical Framework

As recommended by Arksey & O'Malley, in 2005 we concentrated on the mapping of research rather than synthesizing evidence for particular interventions. Quantitative analysis described distribution of capability frequencies, spatial patterns, and temporal trends. Mediation mechanisms, theoretical implications, and methods were analyzed qualitatively.

3. Results

Drawing on 105 studies, we uncover mediating roles of ESG strategy and performance along with firms' underlying capabilities. Findings indicated five capability groups mediated by specific mechanisms, with poor insight into underlying processes.

3.1. Research Landscape Evolution

The territory has increased with over 70% being published in 2024-2025. This expansion seems to be linked with tightening of regulatory measures and a series of high-profile ESG collapses, as well as increasing scholarly attention to the subject. Some pioneering efforts by Tetrault Sirsly (2015) and Goncalves *et al.* (2016) provided a base but failed to explore the capabilities. This direction reached its maturity in 2019 when Hsueh (2019) disaggregated capabilities in voluntary carbon disclosure studies. **Figure 2** shows this evolution.

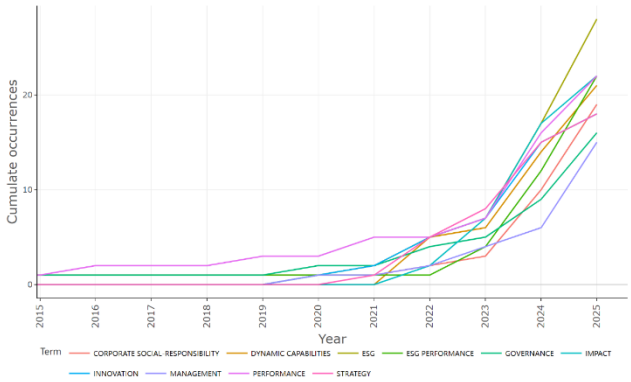

Figure 2. Temporal Evolution of ESG-Capability Research Concepts (2015-2025). Note: Figure 2 displays the temporal evolution of key concepts in ESG capability research generated by R-Bibliometrix package. Lines represent cumulative occurrences across 105 studies.

Many forces propel this move toward capability-focused research. An example of this is with COVID-19, which demonstrated that ESG resilience needs to be implemented into operational capabilities (not policy only), since ESG programs were challenged within a rapidly changing organizational environment, which would require board intervention relative to innovation, networks, and organizational change (Csedo *et al.*, 2022). This further confirmed that ESG effectiveness is based on dynamic capability, with literature to date stressing the importance of organizational ambidexterity, effectuation and business analytics capabilities. Meanwhile regarding innovation capacity as a transformative mechanism for ESG application (Abbas *et al.*, 2025; Al-Nimer, 2024; Deng & Karia, 2025).

3.2. Geographic Distribution and Institutional Context

Geographic patterns show institutional influences. Opportunities and limitations are experienced in the Chinese studies, which amount to 44 studies (41.9%). The rapidity of the ESG policy diffusion in China and rich datasets from mandatory disclosure are sources of empirical richness. This focused intensity raises questions about transference. **Table 1** shows geographic distribution.

Table 1 shows how the geographic distribution of the studies was provided according to the location of the primary source of data (i.e. the place the empirical data

was made), rather than the author affiliation. A classification of studies was made as Multi-country/Global when the analyzed datasets were of three or more countries or Global databases were used. This categorization creates uniformity in the interpretation of institutional contexts in the development of ESG-capability relationships.

Table 1. Geographic Distribution and Institutional Characteristics of ESG Capability Studies

Geographic Context	Count	Percentage	Key Characteristics	Representative Studies
China	44	41.90%	A-share listed companies, mandatory ESG disclosure, state-directed sustainability	Chen *et al.* (2023); Cheng & Li (2025); Ding *et al.* (2024); Hou *et al.* (2024); Jiang *et al.* (2025); Chen, L. *et al.* (2024); Hou, D., Yan, *et al.* (2025); Li *et al.* (2025); Yang, H. *et al.* (2024); Yu & Zhu (2025)
Other Regions	31	29.52%	Middle East, India, Australia, theoretical studies, mixed contexts	Al-Nimer (2024); Chang & Hsieh (2024); Dash & Mohanty (2023); Abbas *et al.* (2025); Ahmed *et al.* (2025); Aich *et al.* (2021); Giri & Chaparro (2024); Ricart & Rey (2022); Shahriar & Ko (2024)
Multi-country/Global	11	10.48%	Cross-national comparative analysis, global datasets	Long *et al.* (2023); Yang & Yang (2022); Dsouza *et al.* (2025); Gangi *et al.* (2020); Sigalas (2024); Teng *et al.* (2024); Van Riel *et al.* (2025); Xing *et al.* (2025); Yu *et al.* (2025)
Europe	10	9.52%	Regulatory pressure, stakeholder capitalism, family businesses	Alkaraan *et al.* (2024); Heubeck (2024); Marnoto *et al.* (2024); Niesten *et al.* (2024); Bourdeau *et al.* (2022); Cherbib *et al.* (2021); Pesqueira & Sousa (2024); Suta *et al.* (2025)
Other Asia	7	6.67%	Korea, Japan, Vietnam, Taiwan - developing economy contexts	Chen & Lee (2024); Liang *et al.* (2022); Sekimoto & Amran (2025); Van *et al.* (2025); Jeong *et al.* (2023); Lee, H. *et al.* (2024); Lee, S. & Kim (2024)
North America	2	1.90%	Market-driven ESG, voluntary adoption	Hussaini *et al.* (2023); De Donno (2022)

Table 2. ESG Capability Clusters.

Capability Cluster	Studies	Percentage	Key Components	Representative Literature
Governance Capabilities	39	37.1%	Board effectiveness, risk management, performance measurement, executive leadership, corporate governance	Dong *et al.* (2025); Heubeck (2024); Remo-Diez *et al.* (2025); Tang *et al.* (2025); Ricart & Rey (2022); Sigalas (2024)
Innovation Capabilities	33	31.40%	Green innovation, technological innovation, R&D capabilities, ambidextrous innovation, green technology development	Chen *et al.* (2023); Long *et al.* (2023); Van *et al.* (2025); Yuan *et al.* (2024); Teng *et al.* (2024); Xing *et al.* (2025)
Stakeholder Capabilities	25	23.80%	Stakeholder engagement, relationship management, social license, legitimacy building	Brunet *et al.* (2025); Chipangamate *et al.* (2023); Garg *et al.* (2025)
Digital Capabilities	23	21.9%	Digital transformation, AI integration, data analytics, IoT applications, digitalization	Cheng & Li (2025); Ding *et al.* (2024); Naveed *et al.* (2025); Wang & Zhang (2025); Bourdeau *et al.* (2022); Cherbib *et al.* (2021); Giri & Chaparro (2024); Hsieh (2024); Kim & Yang (2024); Lee, H. *et al.* (2024); Pesqueira & Sousa (2024); Shahriar & Ko (2024)
Dynamic Capabilities	13	12.40%	Sensing, seizing, reconfiguring, absorptive capabilities, adaptive capabilities	Abbas *et al.* (2025); Deng & Karia (2025); Liang *et al.* (2022); Niesten *et al.* (2024); Ahmed *et al.* (2025); Jeong *et al.* (2023); Van Riel *et al.* (2025)

Note: Studies were coded into multiple capability clusters; Therefore, the sum of counts exceeds the total number of studies.

Chinese studies show state coordination. Chen *et al.* (2023) studied Chinese A-share companies, and demonstrated how ESG disclosure facilitates technological innovation by mitigating the financing constraints. Jiang *et al.* (2025) investigated the listed companies in China, they concluded that ESG practices maximize employment

through financing changes and efficiency of production. Bidirectional ESG-digital transformation relationships have also been identified by Cheng & Li (2025).

European research emphasizes stakeholder engagement. Alkaraan *et al.* (2024) analizied UK manufacturing integration of Industry 4.0 by its governance capability. CEO dynamic capabilities effects on ESG performance were also found by Heubeck (2024) and non-linear for board gender diversity. What we need in these contexts are complex governance mechanisms, not state orders.

There are limited multi-country studies that provide boundary spannng insights. According to the report published by Long *et al.* (2023), analyzing 37 countries, found that good national ESG performance significantly enhances green innovation in nations with scarce resources for innovation. This implies that institutional evolution causes changes in capability needs and effect patterns.

3.3. Capability Architecture and Mediation Functions

Five interdependent capabilities that mediate ESG strategy-performance relationships were delineated. These clusters, their underlying theories and roles are summarized in **Table 2.**

There are different types of measurements for each operationalisation of each capability shown in the studies. Combining all studies, the operationalisation for the measurement of innovation capability is most frequently described as R&D intensity in 31 studies, patent counts in 18 studies, and innovation output in 15 studies. Board composition indexes measure governance capability in 24 studies, governance is measured by the presence of ESG committees in 12 studies, and governance is evaluated through governance rating scores in 19 studies. IT investment intensity measures digital capability in 14 studies, digital technology adoption is evaluated in 11 studies, and digitalisation is measured by analysts in 8 studies. Stakeholder capability is measured through stakeholder engagement in 16 studies, CSR quality in 9 studies, and relational networks in 7 studies. Dynamic capability is measured by surveys in 8 studies and strategic change frequency in 5 studies. ESG performance is measured through integrative ESG ratings in 62 studies, ESG ratings by component in 28 studies, carbon emissions in 11 studies, and stakeholder satisfaction in 8 studies. The difference in measurements introduces complexities in the studies and therefore, there is a need for developing standardised measurements in Appendix A.

Among original articles, 33 articles have innovation capabilities (31.4%), most of them are associated with green and technological innovation. As it has been demonstrated by Chen *et al.* (2023), the stimulus to innovation will be reached through signaling as a result of ESG disclosure. On the other hand, Sun and Zhang (2025) form an ambivalent view that ESG performance has a positive relationship with the amount of innovation and a negative association with technological impact. Xuehui Zhang *et al.* (2025) outline that the greater the ESG rating, the greater the defensive patents, although not aggressive patents are granted to firms.

The rest are done through meta-capabilities known as dynamic capabilities (13 studies, 12.4). The absorptive and adaptive capabilities define sustainable performance in the Korean companies in relation to management (Liang *et al.*, 2022). OA and FI capabilities interaction in the study by Abbas *et al.* (2025) is synergist.

Digital capacity (23 studies, 21.9) is an improved variable compared to brings change. The fact that the association in the work by Cheng Lin (2025) is two-way is indicated by the simultaneous nature of the relations in the study. The paper by Wang and Zhang (2025) is concerning AI enabled supply chains and expediency through innovation and partnership. Findings of Naveed *et al.* (2025) also demonstrate that the effectiveness channel is associated with the high degree of variety of sustainability committees and characteristics of ownership architecture.

Governance capabilities include structuring capabilities (39 studies, 37.1%). According to Heubeck (2024), the results of simulations on non-linear diversity on boards are in no way in harmony with naive assumptions. The effects of performance measurement system are demonstrated by Dong *et al.* (2025) using psychological empowerment.

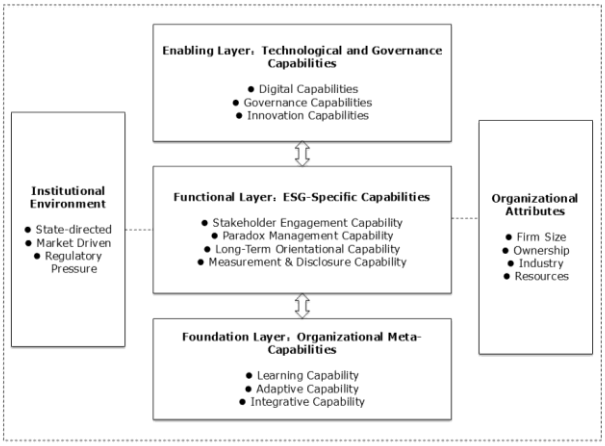

Figure 3. Conceptual Framework - ESG Capability Architecture and Mediation Mechanisms

Stakeholder governance is enabled by stakeholder capacities (25 studies, 23.8% of the literature). At an epistemic level and a system of governance, it is at a learning-organizational processes that governance structures are correlated to social outcomes that are acceptable. The dilemma between the social license and technological advancements is also evidenced in the mining (Chipangamate *et al.*, 2023). **Figure 3** gives a summary of these clusters.

3.4. Mediation Pathways to Performance

There are three routes through which capabilities transmit to performance. Successful implementations use all three. These pathways and the relative mechanisms are revealed in **Table 3**.

Table 3. Mediation Pathways in ESG Implementation.

Mediation Pathway	Studies	Key Mechanisms	Performance Outcomes	Relevant Studies
Innovation Pathway	14	Green innovation, technological innovation, R&D enhancement, patent development	Innovation output, patent quality, technological capabilities, green technology development	Chen *et al.* (2023); Fan *et al.* (2023); Long *et al.* (2023); Ma *et al.* (2025); Sun & Zhang (2025); Van *et al.* (2025); Wu *et al.* (2024); Wu (2024); Yuan *et al.* (2024); Yu *et al.* (2024); Zeng *et al.* (2024); Xiaosan Zhang *et al.* (2025); Xuehui Zhang *et al.* (2025); Zhao *et al.* (2023)
Stakeholder Pathway	12	Stakeholder engagement, legitimacy building, relationship management, social capital	Stakeholder satisfaction, legitimacy, social license, reputation, relationship quality	Brunet *et al.* (2025); Chipangamate *et al.* (2023); Garg *et al.* (2025); He & Ma (2024); Hsueh (2019); Jiang *et al.* (2024); Lee *et al.* (2024); Li (2025); Luan & Wang (2024); Tang *et al.* (2025); Wang *et al.* (2024); Yang *et al.* (2025)
Efficiency Pathway	8	Resource optimization, cost reduction, operational efficiency, risk mitigation	Financial performance (ROA, ROE), operational efficiency, risk reduction, market valuation	Ding *et al.* (2024); Dsouza *et al.* (2025); Jiang *et al.* (2025); Li & Sun (2024); Song *et al.* (2024); Yang *et al.* (2025); Yin *et al.* (2023); Tan & Wei (2023); Aich *et al.* (2021); Chen, L. *et al.* (2024); De Donno (2022); Du *et al.* (2025); Lee, S. & Kim (2024); Li *et al.* (2025); Suta *et al.* (2025); Yu *et al.* (2025)

Note: The study counts document the papers that unambiguously scrutinise each pathway in the role of mediation between capabilities and performance. Given that some studies analyse several pathways at the same time, the counts are not mutually exclusive. The 'Relevant Studies' column cites, for each pathway, some representative studies that should be regarded as illustrative and not exhaustive.

The innovation trail (14 articles) centers on green innovation and R&D. Chen *et al.* (2023) find that ESG disclosure has an effect on innovation driven by financing constraints and signaling. Wu *et al.* (2024) have shown that green cognition at the executive level affects innovation via ESG mediation factors. As noted by Yuan *et al.* (2024), a number of mechanisms allow ESG ratings to encourage innovation in green technology.

The stakeholder path (12 studies) recognises that developing relations and securing legitimacy are key. Tang *et al.* (2025), network management influences ESG through information spreading. Jiang *et al.* (2024) ESG is a form of legitimacy signal for the extension of emerging multinationals.

The efficiency route (8 studies) enhances operations through better resource utilization. Jiang *et al.* (2025) reveal that ESG acts on employment via financing and efficiency. Yang *et al.* (2025) prove that ESG fosters commercial credit financing by increasing transparency and reducing risks.

3.5. Industry Variations and Contextual Factors

The industry environment influences the capabilities according to industry mechanisms and stakeholder expectations. A number of sectors are also coming to attempt and find an array of tactics that highlight the need to raise ESG goals, with these particularly prevalent in manufacturing, finance and energy. Such variances relate partly influences of regulations, environmental impact and stakeholder expectations forming diverging paths in capabilities development (Mcivor *et al.*, 2025; Niesten *et al.*, 2024).

There is strong emphasis on manufacturing (12 studies) due to its environmental impact and supply chain complexity. Abbas *et al.* (2025) argue that organizational ambidexterity facilitates frugal innovation in the Turkish manufacturing sector, while Zhao *et al.* (2023) show that digital transformation improves ESG performance through green innovation in 224 Chinese enterprises. The industry's emphasis on operational capabilities is also corroborated by studies showing that green manufacturing increases ESG performance due to innovation and decreased financing constraints (Zeng *et al.*, 2024). Capability-based approaches are also attractive to non-state-owned and technology-intensive manufacturing enterprises (Miao *et al.*, 2023).

Banking services A focuses on governance capabilities and stakeholder management as per regulatory mandate (8 studies) 3.4. Al-Nimer (2024) reveals innovation mediates the relationship between strategic risk integration and ESG performance in Jordanian banking; Hasnaoui (2025) probes high-ESG mutual funds perform market timing with regard to Eurozone tech investments. This industry's double function as an ESG implementer and enabler requires skills for internal governance and external ESG assessments (Huang, 2024; Remo-Diez *et al.*, 2025).

Six studies in the field of energy sector investigate tensions between environmental barriers and possibilities for technological advances. Wang & Zhang (2025)

demonstrate that using AI in supply chains drive ESG performance via advancement and cooperation with regard to renewable energy. The transition of the industry demands a broad capability portfolio that combines long lasting operational excellence with novel digital and sustainability skills (Csedo *et al.*, 2022) (**Figure 4**).

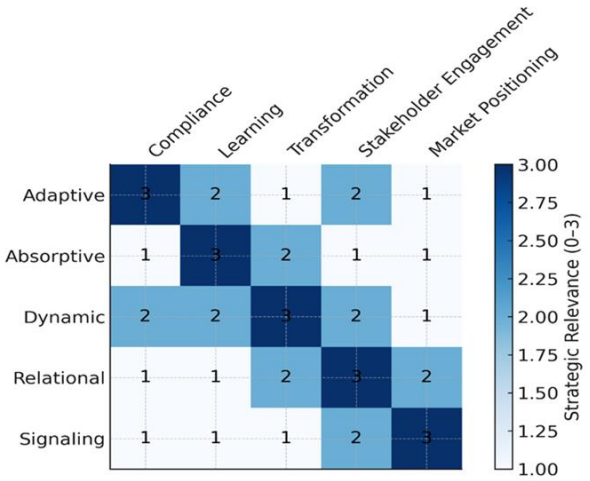

Figure 4. Matrix of Strategic Relevance Places a Value on Capability Along these Key Industry Themes. Note: Figure 4 displays strategic relevance across industries. Values represent relevance scores (0-3 scale) based on capability emphasis patterns.

3.6. Capability Development Barriers and Implementation Constraints

Most research is about positive relationships, not breakups. This results in underestimation of the understanding of practical capability operating. Building adequate capacities is hampered by general resource constraints in all settings. Song *et al.* (2024) prove external guarantees can destroy ESG by draining resources. In the findings of Ma *et al.* (2025) mentioned that the existence of a financial constraint would be arrive to dam the effectiveness of green innovation, where it emphasizes that there must be a good and regular funding on this case; something that many organizations do face. Capacities cannot be achieved by periodic infusions, difficult in case of resource strained organizations.

Further, you may have conflicting combinations of capabilities in practice. Luo (2025) shows that strengthened internal controls led to layoffs in hospitality companies during COVID-19. This underscores the trade-offs between different ESG dimensions that capability frameworks tend to ignore, such as governance capabilities causing a deterioration of social performance under distress. These tensions suggest that parallel development of multiple ESG competencies might lead to conflicting approaches within the firm rather than their synergistic use.

The structure has impact how they are performative and capabilitizing. Firm characteristics moderate capability effectiveness. Hou *et al.* (2024) point out that digital transformation yields ESG-performance improvement mainly during the mature and decline stage rather than growth stages. Yang *et al.* (2025) demonstrate that ESG financing effects differ significantly among polluting and clean industries. These observations support the idea of some skills being perceived as useful in one discipline and less relevant in another.

These hurdles illustrate why in practice, also capability-based ESG approaches often falter. Institutions may possess the necessary abilities, but lack the resources to activate them, become plagued from within by a discord between abilities, and function where their abilities have no bearing. Knowing these parameters will be crucial in revealing the capacity puzzle discussed here.

3.7. Failure Mechanisms in ESG Implementation

The literature reviewed shows a systematic positive bias, although a small subset of studies (n=11, 10.5%) mention null or negative relationships between capabilities and ESG outcomes. Fresh evidence from Lei and colleagues (2025) offers especially pertinent illustrations of these failure mechanisms. A systematic examination of these cases shows three specific failure mechanisms which are important to understand from both research and a practical standpoint.

The above patterns of failure indicate that not all patterns of capability development are positive. Instead, such patterns are likely dependent on the availability of resources, organisational cohesion, and the alignment of institutions. As Lei and Kocoglu (2025) show, the cost of compliance is a double-edged sword. In some cases, failure to comply, even with the best of intentions, can create a situation that is worse than none at all. In the same fashion, Lei (2025) documents how some climate adaptation investment results in what he calls ‘selective vulnerability,’ whereby some people are protected, while others are not. Moreover, the literature on capability development must begin to address the more negative aspects of the field by determining the boundary conditions within which certain capabilities become liabilities, rather than assets.

4. Discussion

While the literature shows that capability sets influence ESG performance, there is limited empirical evidence related to the mechanisms involved. Literature shows links but not processes. Such an analysis reveals three theoretical and methodological challenges.

4.1. The Capability Black Box Concept

There’s a lag between finding and doing. Although talents seem to have an impact on ESG performance, how they work as well is more or less vague. The term ‘capability black box’ betrays a profound misunderstanding of the differences between skills and real-life performance.

The black box problem occurs when capability and performance are correlated through research without an explanation of what is happening in between. One related body of literature has established the positive associations between certain abilities and ESG outcomes but failed to reveal the underlying process (Abbas *et al.*, 2025; Al-Nimer, 2024; Liang *et al.*, 2022; Fan *et al.*, 2023; Ding *et al.*, 2024; Korankye *et al.*, 2025). For example, while

ambidexterity and innovation capabilities are positively related to better ESG performance, we still do not know the mechanisms that link such competencies to environmental and social outcomes (**Table 4**).

Table 4. ESG Implementation Failure Mechanisms

Failure Mechanism	Description	Representative Studies	Theoretical Explanation
Resource Drain	Over-investment in specific capabilities crowds out resources for other strategic priorities, creating trade-offs rather than synergies	Ma *et al.* (2025); Jiang *et al.* (2025); Song *et al.* (2024); Lei & Kocoglu (2025)	Excessive green patent filing diverts R&D resources from core innovation, weakening overall performance while inflating E scores; compliance costs crowd out efficiency investments
Capability Conflict	Simultaneous development of multiple capabilities creates organizational tensions and conflicting priorities	Liu & Wang (2025); Hou *et al.* (2025); Brunella *et al.* (2024)	Pursuit of technological innovation conflicts with stakeholder engagement demands, as rapid change threatens community relationships
Institutional Misfit	Capability deployment strategies effective in one institutional context fail when transferred to different regulatory or cultural environments	Jiang *et al.* (2024); Lei (2025); Lei & Xu (2025a)	Market-oriented governance practices from developed economies underperform in state-directed systems; climate adaptation creates selective vulnerability where protection becomes accessible only to wealthy households

ESG capabilities are complex. Individual capability models are insufficient. Various studies evidence that leveraging of these levers in a concerted manner is crucial to realize ESG benefits (Sekimoto & Amran, 2025; Zhang *et al.*, 2024; Cichosz *et al.*, 2025; Van *et al.*, 2025; Deng & Karia, 2025). These studies demonstrate a variety of complex interactions among abilities, but do not specify the mechanisms that support these conjoint effects.

The evidence base would indicate that contextual differences do restrict our analysis of performance capabilities. Heterogeneity studies indicate that identical capabilities lead to different results depending on organizational, sectoral, and institutional conditions (Chen & Lee, 2024; Hou *et al.*, 2024; Yang *et al.*, 2025; Li & Sun, 2024; Jiang *et al.*, 2025; Dsouza *et al.*, 2025; Heubeck, 2024; Miao *et al.*, 2023). Usually, context is simply considered as numerical entities and not as true theoretical basis that greatly influences operational skills efficacy.

This has implications. Capabilities highlighted in research may be built without organizations noticing improvements in ESG performance because their understanding of the operational efficiency of such capabilities is limited in domain specific contexts. It is important to clarify that in this review, we conceptualize organizational capabilities primarily as mediating mechanisms that explain how ESG strategies translate into performance outcomes, rather than as moderating variables that strengthen or weaken this relationship. This means that these capabilities can be seen as 'carriers' or 'transmission mechanisms' for strategic intent and its potential outcomes. Although some research looks at certain contextual features (e.g., institutional pressure, firm size) as moderators of the capability-performance relationship, the central theoretical framework positions capabilities as intermediary variables in the cause-effect relation from strategy to performance.

4.2. Process Mechanisms and Implementation Reality

Studies acknowledge complexity but not mechanism. Capability building is also cognitive, organizational and networked processes about which little is known (Wu *et al.*, 2024; Dong *et al.*, 2025; Tang et. al, 2025; Naveed *et al.*, 2025). Wu *et al.* (2024) explore the link between executive mindset and ESG performance via capabilities. They don't explain how thinking transforms. Dong *et al.* (2025) argue that reporting systems shape ESG performance. They do not specify which ways of measuring inhibit or stimulate these consequences, and they do not show how the effects spread in a company. Tang *et al.* (2025) have argued that network position influences ESG performance via information sharing. They don't tell you how to create and maintain useful networks.

These empirical results highlight three further gaps in developing capabilities. Development has many stages and loops. Earlier decisions invest and shape future decisions (Yuan *et al.*, 2024; Wu *et al.*, 2024; Ma *et al.*, 2025; Cheng & Li, 2025). There are connections in the literature and arguments around them, but no work seems to address organizational cause and effect structures. An organizational context always matters in the working of capabilities. There are contexts in which capabilities will fail (Naveed *et al.*, 2025; Wang & Zhang, 2025; Miao *et al.*, 2023; Yang *et al.*, 2025). Various types of firms illustrate the point with empirical studies, but these studies provide the least help in suggesting easier conditions for achieving the positive outcome. A slower burn, as opposed to just a one-off investment, is the most neglected element of the management of capabilities (Tang *et al.*, 2025; Brunet *et al.*, 2025; Cichosz *et al.*, 2025).

A lack of understanding of the processes involved is the most significant barrier to organizations attempting to develop ESG capabilities. There is a clear inability to bridge the action gaps, especially the processes of change,

understanding of feedback loops, and actions that initiate the processes.

Table 5. Research Gaps and Future Directions

Research Gap	Current State & Limitations	Future Research Opportunities	Supporting Evidence
Process Understanding	The literature is dominated by correlation-based analysis without mechanism exploration; very few studies examine actual longitudinal processes. This results in a poor understanding of how capabilities grow over implementation stages.	Design multi-wave longitudinal studies to follow capabilities developed over a period of 5+ years; do ethnographies which capture the how, where and when change happens; use process tracing methodologies; trace capability-building sequences and feedback loops	Heubeck (2024); Hu et al. (2025); Chen et al. (2023); Ding et al. (2024); Cheng & Li (2025); Wang & Hu (2022); Yang & Yang (2022); Fan et al. (2023); Deng & Karia (2025); Alkaraan et al. (2024); Abbas et al. (2025); Liang et al. (2022)
Failure Analysis	The literature demonstrates a systematic positive bias. Very few studies examine negative outcomes or implementation failures, leading to an absence of systematic barrier identification and capability deterioration analysis.	Systematic investigation of failed ESG initiatives across industries and contexts; development of failure taxonomies and early warning systems; analysis of capability deterioration conditions; mixed-method studies examining implementation barriers and resistance factors	Song et al. (2024); Liu & Wang (2025); Ma et al. (2025); Brunella et al. (2024); Miao et al. (2023); Xiao et al. (2024)
Cross-institutional Validity	There is an extreme geographic concentration, with a large portion of studies focusing on China. Few studies conduct genuine multi-country comparisons, limiting the consideration of institutional context variations and cultural differences.	Multi-country replication studies using identical methodologies across developed and emerging markets; institutional boundary analysis examining how regulatory environments shape capability development; cross-cultural validation of capability frameworks and measurement instruments	Long et al. (2023); Gangi et al. (2020); Dsouza et al. (2025); Yang & Yang (2022); Billi & Bernardo (2025); Huang (2024); Gordano et al. (2024); Li (2025); Hsueh (2019); Albino-Pimentel et al. (2021); Niu et al. (2022)
Capability Interactions	The vast majority of studies focus on individual capabilities in isolation. Few studies examine capability synergies and interactions, resulting in a lack of systems-level analysis and configurational approaches.	Configurational studies using fsQCA and set-theoretic methods; development of capability ecosystem models; investigation of capability trade-offs, complementarities, and substitution effects; systems dynamics modeling of capability interactions	Sekimoto & Amran (2025); Zhang et al. (2024); Csedo et al. (2022); Alkaraan et al. (2024); Deng & Karia (2025); Abbas et al. (2025); Lee et al. (2024); Marnoto et al. (2024); Korankye et al. (2025); Omonijo & Zhang (2025); Van et al. (2025)
Temporal Dynamics	Most studies use static cross-sectional snapshots. Few incorporate temporal dimensions, limiting the understanding of capability lifecycle stages, maturation patterns, and evolution trajectories.	Multi-wave panel studies spanning capability development phases; investigation of capability maturation patterns and lifecycle stages; analysis of capability decay, renewal, and transformation cycles; examination of temporal contingencies and evolutionary pathways	Heubeck (2024); Hu et al. (2025); Hou et al. (2024); Yang & Yang (2022); Sun et al. (2022); Gangi et al. (2020); Chen et al. (2023); Long et al. (2023); Fan et al. (2023)
Measurement Standardization	There is severe definitional inconsistency and widespread conceptual confusion across capability types (e.g., significant overestimation in dynamic and governance capabilities). There is an absence of validated measurement instruments and psychometric testing.	Development of psychometrically validated capability scales with established reliability and validity; creation of standardized capability definitions and measurement protocols; establishment of capability assessment standards with convergent and discriminant validity; meta-analytic validation studies	Abbas et al. (2025); Liang et al. (2022); Niesten et al. (2024); Al-Nimer (2024); Chen & Lee (2024); Cheng & Li (2025); Dong et al. (2025); Heubeck (2024); Brunet et al. (2025); Chipangamate et al. (2023)

The most recent empirical research shows diversity in the relationships between capabilities and performance. Extreme climate risk, as shown by Lei and Xu (2025a), exacerbates household energy poverty as a result of the disruption of economic infrastructure and volatility of prices. This means that the environmental capabilities in this case need to be coupled with social equity. Lei and Kocoglu (2025) state that the cleaner production mandates in China are a negative case; the compliance costs crowd out the efficiency-enhancing investments and

as a result, the carbon performance is even worse. This finding is an example of the need for context-specific scope boundaries of regulation. Concerning network effects, Lei and Xu (2025b) describe how the centrality of a venture capital firm stimulates green innovation empirically because of knowledge spillovers, reputation, and governance. Lei and Zhang (2025) demonstrate that the empirical corpus on green innovations and human capital is a specific channel for the innovation triad construct: training of employees, the level of technical training of the workforce, and the quality of the education of the workforce. Lei (2025) describes the high price of climate-resilient infrastructure that outprices poor people as adaptive inequality. Collectively, these studies suggest a focus shift to the process of mechanisms and distributive impacts.

Concrete guidance is required to address the cross-sectional predominance in this literature. Future research should utilise multi-year ESG data panels—Refinitiv, CSMAR, or Bloomberg—spanning at least five years. Lag capability variables by one period: R&D intensity for innovation, board sustainability committees for governance, digital investment for technology, and stakeholder engagement frequency for relational. Two empirical approaches should be considered. First, employing two-step system GMM with second and third lags as instruments; acceptable specifications should present AR(1) $p < 0.05$, AR(2) $p > 0.10$, and Hansen J $p > 0.10$. Second, two-way fixed effects with firm and year dummies to address cross-section heterogeneity and macro shocks. For robustness, reverse the lag order, alter the empirical proxies, conduct industry or size threshing, and implement placebo futures (null outcome expected). These approaches would push the field from cross-sectional correlation to more reliable causal identification.

4.3. Geographic Clustering and Institutional Limits

The vast majority of studies take into account Chinese companies, which poses difficulties regarding ESG competencies at a worldwide level. Studies, including those of China, suggest that coordination by a state can foster rapid development. Government support, rules and state owned make the capabilities development (Chen *et al.*, 2023; Cheng & Li, 2025; Hou *et al.*, 2024; Yang *et al.*, 2025; Jiang *et al.*, 2025).

European research shows different patterns. European enterprises and the engagement of stakeholders and cooperative governance. Chinese capabilities are not transferable to market economies (Remo-Diez *et al.*, 2025; Hasnaoui, 2025; Marnoto *et al.*, 2024; Mcivor *et al.*, 2025).

Cross-country comparisons are scarce and most often point to a lack of transferability. Long *et al.* (2023) also indicate that skill shortages are a barrier to ESG factors in green innovation across 37 countries, and Dsouza *et al.* (2025) find contrasting mediation effects among OECD-developed countries. This evidence suggests that the institutional context has a substantial effect on the capability dynamics, however comprehensive comparative studies are still scarce. Geographical imperatives inform our theory outcomes and trouble our understanding of how different institutional forms might frustrate or promote capability expansion.

4.4. Research Agenda and Limitations

Using the established patterns and the limitations, **Table 5** integrates six important research gaps and proposes actionable directions for future research for each gap. These gaps are underpinned by empirical findings in the literature, and each includes methodological suggestions for the guidance of future research.

Literature offers associations but less information about the manner by which capabilities actually develop or get activated (Chen *et al.*, 2023; Zhang *et al.*, 2024). This limitation is likely to be partly addressed by multi-wave longitudinal research investigating how capabilities unfold over time, the lack of which is noted in previous work (Heubeck, 2024; Hu *et al.*, 2025). The complete failure to perform systematized failure analysis apart from Song *et al.* (2024) who interrogated the negative capability effects, represents an additional methodological chasm that should be filled with well-researched studies.

Research examines individual capabilities. There have been few investigations focusing on the interaction of multiple capabilities. Some studies show synergies among various capabilities (Sekimoto & Amran, 2025; Zhang *et al.*, 2024; Van *et al.*, 2025). These capability interrelationships might be more appropriately represented through configurational approaches than with linear models. Research also requires common measurement methods. Most of the conceptualizations are not adequately tested (Abbas *et al.*, 2025; Al-Nimer, 2024) and this undermines theory building.

Geography is limiting the extent to which findings can be generalised between countries. There are limited numbers of comparisons between contexts at the institutional level (Long *et al.*, 2023; Gangi *et al.*, 2020; Dsouza *et al.*, 2025). Future research needs multi-country studies. This would demonstrate the extent to which capability development is influenced by other actors and when such relationships can transfer across governance systems.

This review recognizes and appropriately states many important limitations that are inherent to the focus and methodology of the research in question. Limitations: Limiting the search to Web of Science and using only one search strategy as well as the terms “ESG + Strategy + Capability” may have omitted relevant studies that applied other words. Generalizability and theoretical coherence are also limited by the geographically focused sample and measurement inconsistencies. Quantitative methods dominate, potentially limiting the depth of processual insights, and the search date does not fully capture a fast-moving field in which exciting new discoveries are likely to have been made.

5. Conclusions

What this analysis exposes is a fundamental gap: the necessary organizational capabilities to realize ESG aspirations are poorly understood. An analysis of 105

empirical papers reveals a field rich in correlational findings and poor in understanding why. We identified five clusters of capabilities operating via three unique mechanisms; however, the structures of organizations that enable these mechanisms remain unclear. Most are from the context of China, reporting state-led insights while also raising concerns about their transferability. The lack of analysis on failures limits an integrated picture of the possible implementation problems practitioners may face.

The framework for improvement, including capabilities in black box, development paths covered, coordinating mechanisms and instigating conditions. This view reframes ESG, repositioning it from a 'box to be ticked' (compliance) to a strategic barrier, and from 'does ESG have value?' to that of 'what role can skills play in supporting the success of ESG initiatives?' Seizing this opportunity requires overcoming the rollout's challenges through strategies that demonstrate tools, create coalitions of actors, and link assessments of failure to stories of success. Only by unpacking the black box can our field move beyond correlation to causation and contribute to organizations with ESG strategies that can be actually implemented.

While this review provides a comprehensive overview, it is not without its constraints. Our reliance on the Web of Science and English-only articles likely excluded pertinent work published in other languages or indexed in regional databases. The keyword strategy was also intentionally specific; by prioritizing "capability," we may have bypassed studies using related concepts like "competences." Methodologically, we adhered to scoping review methodologies by omitting formal quality assessments and meta-analyses, which is a limitation for us to be prescriptive in our conclusions. Finally, because the current literature is dominated by cross-sectional data from China, the universal applicability of these patterns remains to be seen. Addressing these gaps through longitudinal and multi-country studies represents a vital next step for the field.

Appendix A: Capability Measurement Framework

This appendix illustrates the operational definitions and measurement proxies for the capability clusters in **Table 2** to aid in the transparency of the research and to assist in future empirical work. These literatures and synthesised indicators are the indicators of most assessments of capability. Each assessment of capability indicator is illustrated in **Table A1**.

Table A1. Capability Measurement Framework

Failure Mechanism	Description	Representative Studies	Theoretical Explanation
Resource Drain	Over-investment in specific capabilities crowds out resources for other strategic priorities, creating trade-offs rather than synergies	Ma et al. (2025); Jiang et al. (2025); Song et al. (2024); Lei & Kocoglu (2025)	Excessive green patent filing diverts R&D resources from core innovation, weakening overall performance while inflating E scores; compliance costs crowd out efficiency investments
Capability Conflict	Simultaneous development of multiple capabilities creates organizational tensions and conflicting priorities	Liu & Wang (2025); Hou et al. (2025); Brunella et al. (2024)	Pursuit of technological innovation conflicts with stakeholder engagement demands, as rapid change threatens community relationships
Institutional Misfit	Capability deployment strategies effective in one institutional context fail when transferred to different regulatory or cultural environments	Jiang et al. (2024); Lei (2025); Lei & Xu (2025a)	Market-oriented governance practices from developed economies underperform in state-directed systems; climate adaptation creates selective vulnerability where protection becomes accessible only to wealthy households

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