Vifada Management and Social Sciences, E-ISSN 2987-1999

Collaborative Sustainable Development Strategy: Linking Dynamic Capabilities To Sustainable Business Performance in The Indonesian Cocoa Value Chain

Asni Mustika Rani [(1*)] *Agus Rahayu* [(2)] *Lili Adi Wibowo* [(3)] *Alfira Sofia* [(4)] *Umari Abdurrahim Abi Anwar* [(5)]

[(1,2,3,4)] *Universitas Pendidikan Indonesia, Bandung Indonesia*
[(5)] *Universitas Islam Bandung, Bandung, Indonesia*

Received: 2025, 05,22 **Accepted**: 2025, 08,19
Available online: 2025, 12,28

*Corresponding author.
E-mail addresses: asnimustika@upi.edu

KEYWORDS

Keywords:
Dynamic Sustainable Supply Chain Capabilities; Collaborative Sustainable Development Strategy; Sustainable Business Performance; Cocoa Industry.

Conflict of Interest Statement:
The author(s) declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

ABSTRACT

Sustainability pressures in agricultural value chains are no longer distant policy discussions. They now influence how firms organize sourcing, production, and distribution on a daily basis. In Indonesia's cocoa sector, these pressures go beyond compliance. Firms are increasingly required to embed environmental and social considerations into their operational decisions if they wish to maintain market access and competitiveness. This study examines how Dynamic Sustainable Supply Chain Capabilities (DSSCC) relate to Sustainable Business Performance (SBP) and whether a Collaborative Sustainable Development Strategy (CSDS) serves as the mechanism linking the two. Survey data were collected from 40 downstream bean-to-bar cocoa firms and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results reveal a clear pattern. DSSCC strongly supports the formation of CSDS, indicating that leadership commitment, sustainable sourcing, responsible processes, sustainable delivery systems, technology management, and social capability create the internal conditions necessary for collaboration. However, DSSCC does not directly improve SBP. Performance gains emerge when these capabilities are enacted through structured collaboration. CSDS fully mediates the relationship between DSSCC and SBP, suggesting that sustainability outcomes improve when firms work closely with farmers, buyers, communities, and regulators rather than relying solely on internal initiatives. The study draws on the Resource-Based View, Dynamic Capabilities Theory, Stakeholder Theory, and Institutional Theory to frame sustainability transitions as relational processes that unfold across value chains. The findings underline a practical implication: strengthening internal capability is important, but sustainable performance depends on how effectively firms translate that capability into collective action.

Introduction

Sustainable development has moved from an abstract agenda to an operational issue that directly affects how food value chains run. This shift is especially visible in agriculture, where supply chains connect smallholders to global markets. Sustainability demands now appear in day-to-day decisions about farming practices, sourcing arrangements, quality control, and market access. Regulations, buyer requirements, and international commitments have changed what counts as "acceptable" performance. Sustainability is no longer treated only as a compliance checklist or an internal efficiency project. It increasingly reflects collective outcomes shaped by interactions among firms, farmers, communities, and institutions. Cocoa is a clear example because ethical sourcing, environmental responsibility, and inclusive development are now expected across a fragmented and multi-actor chain.

In Indonesia, these external pressures meet persistent structural constraints. Cocoa used to be a strong contributor to national economic performance, yet the sector has weakened over time. Production has declined, cultivated areas have shrunk, and exports have lost momentum (BPS – Statistics Indonesia, 2024). Data from Directorate General of Plantations (Direktorat Jenderal Perkebunan, 2024) show that cocoa production fell from 767,280 tons in 2019 to 641,248 tons in 2024. This represents a cumulative decline of about 16.43% over five years, alongside a contraction in plantation area from roughly 1.7 million to 1.5 million hectares. Aging trees, pest and disease pressure, and limited rejuvenation continue to constrain productivity. Export volumes also indicate erosion of market position. By 2023, exports had decreased to around 340,000 tons, at a time when sustainability requirements are becoming more decisive for market access.

The competitive challenge is no longer only about volume. Buyers increasingly consider quality and the ability to meet sustainability criteria. Indonesia remains one of the major cocoa producers, yet only a limited share of exports can be positioned as fine or certified cocoa. FAO (Food and Agriculture Organization of the United Nations (FAO), 2024) estimates that around 10% of Indonesian cocoa exports fall into the fine flavor category, still below levels observed in Ghana or Côte d'Ivoire where quality and certification systems have been institutionalized for longer. Nugraha and Hitchins note that sustainability certification has gradually become a normal sourcing condition rather than an optional premium feature (Nugraha & Hitchins, 2021). Under these conditions, sustainability is tied to whether firms can maintain access to international markets.

Institutional forces intensify this pressure. Regulations, buyer requirements, and sector standards operate together, producing coercive, normative, and mimetic pressures that shape firm behavior over time (DiMaggio & Powell, 1983). Managers cannot organize production and supplier relationships in conventional ways and still expect to compete. They are pushed to revisit how they work with farmers, intermediaries, communities, and regulators. Many adjustments happen through learning and experimentation rather than through fully formalized programs. Sustainability, in practice, is becoming a baseline requirement for doing business rather than a reporting add-on.

One common response has been capability building. This study focuses on Dynamic Sustainable Supply Chain Capabilities (DSSCC). Based on the Resource-Based View and Dynamic Capabilities Theory, DSSCC are treated as more than routine operational skills. They represent a sustainability-oriented bundle that includes leadership direction, sourcing practices, internal processes, logistics, technology management, and social responsibility (Barney, 1991; Teece et al., 1997). These capabilities should help firms sense change and reconfigure routines as sustainability demands evolve. Field observations in the Indonesian cocoa sector, however, suggest uneven capability development. Firms that operate closest to smallholders often face sharper resource constraints, coordination gaps, and limited institutional support, which weakens capability formation where it may be most needed.

Capability building alone also does not guarantee better sustainability performance. Dynamic capabilities can support adaptation and learning (Beske, 2012), but their effects are often constrained when firms act in isolation. Evidence from emerging economy contexts points in a consistent direction: collaboration is frequently required to close implementation gaps and to turn strategic intent into real changes in practice (Dariah et al., 2025; Hall & Wagner, 2012). Cocoa supply chains are fragmented. Problems related to farmer livelihoods, environmental degradation, and certification readiness are distributed across many actors. A single firm rarely has the authority, resources, or legitimacy to address all these issues on its own.

This study therefore positions a Collaborative Sustainable Development Strategy (CSDS) as a central mechanism that can translate internal capabilities into measurable outcomes. CSDS refers to structured collaboration among firms, farmers, buyers, communities, and regulators to pursue shared sustainability goals through farmer empowerment, productivity improvement, and environmental and social stewardship (Freeman, 2010; Gray & Stites, 2013). These arrangements create space for joint problem solving, shared investment, and regular exchange. They also allow sustainability-oriented capabilities to operate at value-chain level instead of remaining limited to individual organizations.

Despite growing interest in sustainability capabilities and collaboration, many empirical studies still treat these streams separately. The result is a limited understanding of whether collaboration actually mediates the link between internal transformation and sustainability performance,

particularly in agricultural value chains within emerging economies. This study addresses that gap by testing the mediating role of CSDS in the relationship between DSSCC and Sustainable Business Performance (SBP) in the Indonesian cocoa value chain. Using PLS-SEM, the analysis estimates both direct and indirect relationships among the constructs. The study combines RBV, Dynamic Capabilities Theory, Stakeholder Theory, and Institutional Theory to offer a grounded view of sustainability transitions in agriculture. The practical implication is direct: capability strengthening matters, but sustainability performance is more likely to improve when capabilities are mobilized through collaboration and shared responsibility across the value chain.

Literature Review

Conceptual Framework and Hypotheses Development

The conceptual framework of this study assumes that sustainability outcomes within agricultural value chains emerge from the interaction between internal organizational capabilities and externally oriented collaborative strategies. DSSCC is expected to influence both CSDS and SBP, while CSDS functions as a mediating mechanism that translates organizational capabilities into broader value-chain performance outcomes. This framework is grounded in the Resource-Based View, Dynamic Capabilities Theory, Stakeholder Theory, and Institutional Theory, which collectively explain how internal capabilities and external collaboration contribute to sustainability performance.

Fragmented agri-food systems rarely achieve sustainability improvements through isolated organizational efforts. Firms must therefore mobilize internal capabilities through engagement with farmers, buyers, local communities, and regulatory institutions. Prior studies emphasize that sustainability-oriented capabilities and collaborative mechanisms are increasingly important in achieving long-term competitive advantage and organizational resilience (Beske, 2012; Dubey & Gunasekaran, 2016).

The Influence of DSSCC on CSDS

Dynamic Sustainable Supply Chain Capabilities (DSSCC) are expected to strengthen Collaborative Sustainable Development Strategy (CSDS) because organizations with adaptive sustainability capabilities are more capable of building strategic collaboration with stakeholders. Firms possessing sustainability-oriented leadership, sourcing, process management, and technological capabilities tend to engage more effectively with suppliers, farmers, regulators, and communities in achieving sustainability objectives.

According to Teece et al. (1997), dynamic capabilities enable firms to integrate, build, and reconfigure competencies in response to changing environments. In the context of sustainable supply chains, these adaptive capabilities facilitate coordination and collaboration among supply chain actors (Beske, 2012). Similarly, Goyal et al. (2024) and Boeske (2023) argue that leadership commitment and sustainability integration strengthen stakeholder engagement and inter-organizational cooperation. Therefore, organizations with stronger DSSCC are more likely to develop effective collaborative sustainability strategies.

H1 : DSSCC has a significant positive influence on CSDS.

The Influence of DSSCC on SBP

DSSCC are also expected to directly influence Sustainable Business Performance (SBP). Organizations with strong sustainable supply chain capabilities are generally more capable of improving operational efficiency, reducing environmental impacts, and maintaining social responsibility while achieving economic performance. Through adaptive and sustainability-oriented capabilities, firms can strengthen competitiveness and resilience in dynamic business environments.

The Triple Bottom Line perspective emphasizes that sustainable business success should integrate economic, environmental, and social performance (Elkington, 1997). Zhu et al. (2008) found that sustainable operational capabilities contribute positively to environmental and economic outcomes. Furthermore, Hong et al. (2018) reported that firms integrating sustainable supply chain practices

with dynamic capabilities achieve more consistent sustainability performance. Carter and Rogers (2008) also highlighted that sustainability-oriented capabilities can create long-term organizational value and competitive advantage.

H2 : DSSCC has a significant influence on SBP.

The Influence of CSDS on SBP

Collaborative Sustainable Development Strategy (CSDS) is expected to positively influence Sustainable Business Performance (SBP). Collaborative strategies enable organizations to share resources, knowledge, and sustainability responsibilities with multiple stakeholders. Such collaboration can improve productivity, strengthen social legitimacy, and support environmental stewardship across supply chain networks.

Freeman (2010) explains through Stakeholder Theory that organizations achieve sustainability objectives more effectively when stakeholder interests are incorporated into strategic decisions. In addition, Hall and Wagner (2012) argue that collaborative sustainability initiatives improve innovation capability and operational performance, particularly in resource-constrained environments. Gray and Stites (2013) further emphasized that partnerships among firms, communities, NGOs, and regulators strengthen organizational legitimacy and sustainability outcomes. In agricultural value chains, collaboration among firms, farmers, communities, and regulators is therefore essential in creating long-term sustainable performance.

H3 : CSDS has a significant positive influence on SBP.

The Mediating Role of CSDS in the Relationship Between DSSCC and SBP

CSDS is proposed to mediate the relationship between DSSCC and SBP because internal sustainability capabilities may not fully generate performance outcomes without effective collaboration mechanisms. Although DSSCC provide the organizational foundation for sustainability practices, collaborative strategies enable these capabilities to be implemented and expanded across the broader value chain.

Beske and Seuring (2014) explain that sustainable supply chain capabilities become more effective when supported by collaborative relationships among supply chain actors. Similarly, Dubey and Gunasekaran (2016) argue that collaborative mechanisms strengthen the influence of dynamic sustainability capabilities on organizational performance. Through collaboration, firms can improve coordination, trust, resource integration, and collective problem-solving, which ultimately enhances sustainable business performance across economic, environmental, and social dimensions.

H4 : CSDS significantly mediates the relationship between DSSCC and SBP.

Figure 1. **Conceptual Framework**

Research Design and Methodology

Research Approach and Design

This study uses a quantitative design to examine relationships among DSSCC, CSDS, and SBP in Indonesia's cocoa industry. A cross-sectional approach was used to capture how sustainability-oriented capabilities and collaborative practices are structured and applied across firms at a particular point in time.

The hypotheses were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM fits the study because the model includes multiple latent constructs and assesses both direct and mediated relationships with a relatively small and specialized sample. The method allows simultaneous estimation of direct and indirect paths. It is also suitable for complex models and data that may not follow strict normality assumptions, which is common in firm-level survey contexts..

Population and Sampling Technique

The population comprises downstream cocoa firms in Indonesia operating under the bean-to-bar model and engaging in sustainability-oriented practices. Bean-to-bar firms are relevant because they manage the value chain end-to-end, from sourcing cocoa beans to producing finished chocolate. This structure allows sustainability initiatives to be embedded across sourcing, processing, and delivery rather than applied as separate interventions. Based on information released by the Ministry of Agriculture and reported in national media in 2023, there were 31 registered bean-to-bar and artisanal processors in Indonesia (Gandhi, 2023). The segment has continued to evolve as demand grows for traceable, premium, and sustainably produced chocolate. New entrants have appeared, particularly in specialty markets. By 2025, the exact number of active firms could not be confirmed because no central national registry was available. This limitation reflects the fragmented structure of the sector. Data collection was therefore conducted with support from the Indonesian Bean-to-Bar Chocolate Association and in coordination with the Ministry of Agriculture. Through these channels, 40 bean-to-bar firms voluntarily participated and provided complete responses.

A saturated sampling approach was applied. All identifiable firms reachable through available networks and institutional links were invited to participate. This approach aimed to reduce selection bias and to capture variation in sustainability practices within a small industry segment. Respondents were senior personnel (e.g., supply chain, operations, or sustainability managers) involved in strategic decisions on sourcing, production, and sustainability. Their roles help ensure that responses reflect firm-level strategic orientations rather than purely individual preferences.

Given the census-oriented and voluntary design, the study emphasizes analytical rather than statistical generalization. The results are intended to deepen understanding of how sustainability capabilities and collaborative strategies operate in premium cocoa value chains in emerging economy contexts, rather than to produce population estimates.

The sample size (N = 40) reflects the scale of the bean-to-bar segment in Indonesia and satisfies common guidelines for PLS-SEM. Using the 10-times rule, the minimum sample should be at least ten times the largest number of structural paths pointing to any endogenous construct. In this model, SBP has two incoming paths (from DSSCC and CSDS). The minimum implied size is 20. The achieved sample exceeds that requirement.

The census-oriented approach also strengthens internal validity. Including all identifiable firms within a small and well-defined segment allows the analysis to reflect sector realities rather than a narrow subset. In niche industries where the population is limited but strategically meaningful, this approach is methodologically reasonable and substantively relevant.

Data Collection Procedure

Data were collected between January and February 2025 using a structured questionnaire measuring DSSCC, CSDS, and SBP. Respondents rated each statement on a seven-point Likert scale from strong disagreement to strong agreement. This scale was selected to capture finer variation and allow respondents to express nuanced differences in the implementation and outcomes of sustainability practices.

Before the main survey, the instrument was reviewed by a small group of academics and practitioners with expertise in supply chain management and sustainability. The review ensured item clarity, contextual fit, and alignment with the Indonesian cocoa sector. Minor wording adjustments were made based on feedback. Questionnaire items were developed through a detailed review of relevant literature and mapped explicitly to the six DSSCC dimensions, three CSDS dimensions, and four SBP dimensions. The survey was distributed through formal email invitations with follow-up reminders to improve participation and completeness. Clarification interviews were also conducted

with selected respondents to reduce misinterpretation, particularly for sustainability practices that may differ across firms.

Data Analysis Technique

PLS-SEM analysis followed a two-stage procedure. The first stage assessed the measurement model. Reliability was evaluated using Cronbach's Alpha and Composite Reliability (CR). Convergent validity was assessed using Average Variance Extracted (AVE). Indicator reliability was examined via outer loadings. Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio.

The second stage evaluated the structural model and tested hypotheses using path coefficients, bootstrapped t-statistics, and R^2 values. Statistical significance was assessed at the 5% level, with t-values above 1.96 indicating significant effects. The structural equations were:

$$\text{"CSDS"} = \beta_1\text{"DSSCC"} + \varepsilon_1$$
$$\text{"SBP"} = \beta_2\text{"DSSCC"} + \beta_3\text{"CSDS"} + \varepsilon_2$$

Mediation was examined through the indirect effect of DSSCC on SBP via CSDS using bootstrapping. This approach is widely used in PLS-SEM because it estimates mediation without strong distributional assumptions. The next section reports results, beginning with the measurement model and followed by the structural model.

Findings and Discussion

Findings

Reliability, Convergent Validity, and Discriminant Validity

The measurement model was evaluated before assessing structural relationships. Overall, the indicators show satisfactory measurement quality and meet common psychometric standards. Internal consistency reliability was assessed first. Cronbach's Alpha values for all constructs exceed 0.70, indicating strong consistency across items. Composite Reliability (CR) results support the same conclusion. CR values range from 0.941 to 0.975, indicating reliable measurement across constructs (Table 1). These results align with established reliability guidelines and support the robustness of the measurement model (Hair et al., 2022).

Table 1. Reliability result

	Cronbach's Alpha	rho_A	CR	AVE
Collaborative Sustainable Development Strategy	0.930	0.933	0.941	0.593
Dynamic Sustainable Supply Chain Capabilities	0.965	0.967	0.969	0.634
Sustainable Business Performance	0.972	0.973	0.975	0.693

Convergent validity was examined using AVE. CSDS (0.593), DSSCC (0.634), and SBP (0.693) exceed the 0.50 benchmark, indicating that each construct explains more than half of the variance in its indicators. Discriminant validity was then checked to confirm that constructs are empirically distinct. Outer loadings show that indicators load strongly on their intended constructs. The Fornell–Larcker criterion indicates that the square root of AVE for each construct exceeds its correlations with other constructs. HTMT ratios also remain below conservative thresholds. Together, these results indicate clear separation among DSSCC, CSDS, and SBP. The measurement model therefore provides a reliable basis for structural model evaluation.

Coefficient of Determination (R^2)

Model explanatory power was assessed using R^2 values for endogenous constructs (Table 2). CSDS has an R^2 of 0.649, meaning DSSCC explains 64.9% of the variance in collaborative strategy. This is substantial and indicates that internal sustainability capabilities strongly shape collaboration. SBP has an R^2 of 0.761, indicating that DSSCC and CSDS jointly explain 76.1% of performance variance. Using Hair et al.'s benchmarks (Hair et al., 2022), both values fall in the substantial range, showing strong predictive relevance in this context.

Table 2. Coefficient of determination

	R Square	R Square Adjusted
Collaborative Sustainable Development Strategy	0.649	0.639
Sustainable Business Performance	0.761	0.748

Path Coefficients and Hypothesis Testing

Structural results provide direct evidence for the proposed relationships (Table 3; Figure 2). DSSCC has a strong positive effect on CSDS (β = 0.805, t = 13.898, p < 0.001). Firms with stronger sustainability-oriented leadership, sourcing, processes, delivery, technology management, and social capabilities are more likely to engage in structured collaboration with value-chain stakeholders.

CSDS also shows a significant positive effect on SBP (β = 0.787, t = 5.894, p < 0.001). Stronger collaboration is associated with better sustainability performance across economic, social, environmental, and supply chain dimensions. The size of this relationship highlights collaboration as a practically meaningful driver of outcomes.

The direct path from DSSCC to SBP is not significant (β = 0.103, t = 0.717, p = 0.473). This indicates that capability development, when not supported by collaboration, does not translate directly into better performance within this segment of the Indonesian cocoa value chain.

Mediation analysis reinforces this interpretation. The indirect effect of DSSCC on SBP through CSDS is positive and significant (β = 0.634, t = 5.381, p < 0.001). CSDS fully mediates the relationship between DSSCC and SBP. Capability effects appear to materialize mainly through collaborative strategy rather than through isolated deployment.

Table 3. Path coefficient result

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Collaborative Sustainable Development Strategy -> Sustainable Business Performance	0.787	0.783	0.134	5.894	0.000
Dynamic Sustainable Supply Chain Capabilities -> Collaborative Sustainable Development Strategy	0.805	0.806	0.058	13.898	0.000
Dynamic Sustainable Supply Chain Capabilities -> Sustainable Business Performance	0.103	0.104	0.144	0.717	0.473
Dynamic Sustainable Supply Chain Capabilities -> Collaborative Sustainable Development Strategy -> Sustainable Business Performance	0.634	0.630	0.118	5.381	0.000

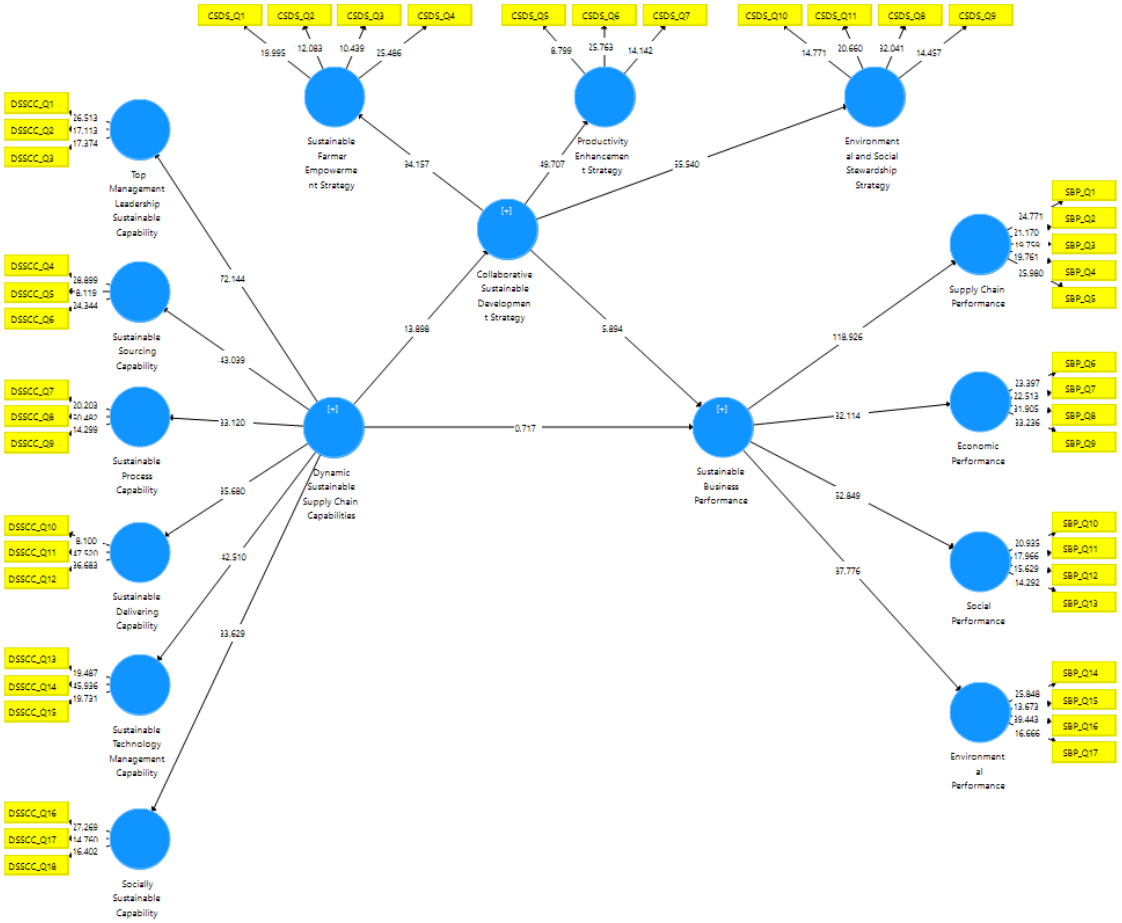

Figure 1. Estimated Structural Model of DSSCC, CSDS, and SBP Using PLS-SEM

Discussion

This discussion focuses on three applied questions: how DSSCC influences CSDS, whether CSDS mediates the DSSCC–SBP relationship, and what these patterns imply for sustainability practice in cocoa. The results point to a consistent message. Internal capabilities matter, but their performance effect is realized mainly through collaboration across the value chain.

The Influence of DSSCC on CSDS

The relationship between DSSCC and CSDS is strong (β = 0.805). Capability development clearly shapes whether collaborative strategies emerge and how they are sustained. Firms with stronger sustainability-oriented leadership, responsible sourcing, improved processes, sustainable delivery, effective technology management, and social engagement are better positioned to initiate collaboration and keep it working.

This finding fits RBV and Dynamic Capabilities Theory, which emphasize internal competencies as enablers of strategic action (Dubey et al., 2023; Teece, 2018, 2023; Teece et al., 1997). The result also adds an important nuance. Capability is potential. It does not automatically become collective action. Collaboration requires deliberate design: routines, commitments, and governance arrangements that channel internal strength outward. DSSCC can be understood as latent capacity, while CSDS represents how that capacity is organized into joint action.

The pattern aligns with studies linking dynamic capabilities to sustainability adaptation (Beske, 2012; Eisenhardt & Martin, 2000). In supply chain settings, these capabilities support reconfiguration of resources and routines toward sustainability objectives (Hong et al., 2018). The evidence here suggests that the strategic value of DSSCC lies not only in making firms more adaptable internally, but in making them more capable partners externally.

CSDS as a Mediator Between DSSCC and SBP

The mediation results provide the central insight of the study. DSSCC does not show a significant direct effect on SBP, yet the indirect effect through CSDS is strong and significant. CSDS fully

mediates the relationship. Collaboration is the mechanism that converts internal sustainability capabilities into performance.

This pattern reflects realities in many emerging economy value chains. Stand-alone sustainability actions can be meaningful, but they often fail to produce stable performance gains when implemented without wider coordination. In Indonesian cocoa, critical resources and legitimacy are distributed across smallholders, cooperatives, NGOs, certification bodies, and government agencies. Sustainability cannot be delivered by one firm alone. CSDS functions as a conduit that connects fragmented actors and aligns goals, investments, and learning processes across the chain.

The result also resonates with prior work emphasizing collaboration as a mediator. Klassen and Vereecke (Klassen & Vereecke, 2012) show that strategic collaboration strengthens resilience and sustainability through trust and joint decision-making. Foerstl et al. (Foerstl et al., 2015) similarly identify buyer–supplier cooperation as a key pathway linking internal capabilities to environmental performance. The implication is direct: collaboration is not an optional supplement. It is the route through which sustainability becomes operational.

Practical Implications for Cocoa Supply Chains

The practical message is straightforward. Internal improvement alone is insufficient. Firms should still invest in DSSCC, but these capabilities need to be embedded in structured collaboration along the supply chain.

CSDS provides a practical architecture for organizing this engagement. Farmer empowerment, joint productivity initiatives, and shared environmental and social stewardship make it easier to distribute risk, share knowledge, and coordinate resources. This matters in cocoa value chains that are geographically dispersed and institutionally fragmented, where power asymmetries can also complicate implementation.

The performance benefits associated with CSDS are likely to touch all SBP dimensions: supply chain, economic, social, and environmental. Many benefits are relational and may not appear immediately in conventional metrics because they are rooted in trust, legitimacy, and resilience. Pagell and Wu (Pagell & Wu, 2009) argue that firms integrating sustainability into core operations while nurturing collaborative relationships achieve more robust outcomes. Vachon and Klassen (Vachon & Klassen, 2006) also show that upstream and downstream collaboration is essential for extending sustainable practices across complex networks.

Policy and Institutional Implications

The findings also carry policy implications. Governance focused only on compliance is unlikely to trigger deeper sustainability transitions. Collaboration requires relational infrastructure. Public institutions can play a catalytic role by creating platforms and mechanisms that sustain joint action, such as regional sustainability hubs, shared traceability systems, collective certification arrangements, and co-investment in community development.

Incentives also matter. Policies that reward cooperative behavior—joint capacity building, participatory governance, and inclusive value creation—are more aligned with the logic of CSDS and with SDGs 8, 12, and 17. The full mediation effect implies that stricter enforcement or technology upgrading alone will not be sufficient. Sustainability governance needs tools that enable long-term collaboration and shared responsibility.

Theoretical Contributions

This study contributes by treating mediation as an active strategic process rather than a passive statistical bridge. CSDS does not merely “carry” effects from DSSCC to SBP. Collaboration reshapes how capabilities are interpreted, recombined, and aligned with stakeholder expectations.

This perspective challenges firm-centric readings of RBV and Dynamic Capabilities Theory that emphasize internal optimization (Eisenhardt & Martin, 2000; Teece, 2018, 2023; Teece et al., 1997). In sustainability settings—especially in emerging economies—capabilities often translate into performance only when embedded in collaborative and institutional arrangements (Beske, 2012; Hong et al., 2018). Using Stakeholder Theory and Institutional Theory, the study also positions firms as actors involved in co-creating norms and governance mechanisms rather than only responding to external rules (Seuring & Gold, 2013). The findings complement work on collaborative governance by showing empirically how relational structures strengthen accountability and co-created value in sustainability transitions (Foerstl et al., 2015; Hall & Wagner, 2012).

Limitations and Directions for Future Research

Several limitations should be noted. The study focuses on downstream bean-to-bar firms, which provides only a partial view of upstream dynamics involving farmers and intermediaries. Future studies

could adopt a multi-actor design to examine interactions across the full chain from farm to finished product. The cross-sectional design also limits inference about how CSDS evolves over time. Longitudinal research is needed to examine how collaboration is built, adjusted, and sometimes weakened. Comparative research across other agricultural sectors or ASEAN contexts would also help clarify how institutional and cultural conditions shape the effectiveness of collaborative sustainability strategies.

Conclusion

This research set out to understand why capability development does not always lead to visible sustainability performance improvements. Evidence from Indonesia's cocoa sector suggests that the issue lies not only in the strength of internal capability, but in how that capability is mobilized.

DSSCC provide an important foundation. They shape leadership orientation, sourcing practices, production systems, logistics, technology use, and social responsibility. Yet these internal strengths do not automatically produce better sustainability outcomes. The findings show that performance improvements occur when those capabilities are activated through collaboration.

The mediating role of CSDS clarifies this mechanism. Collaboration connects fragmented actors, aligns incentives, and enables shared learning. In agricultural value chains characterized by smallholders and institutional complexity, sustainability cannot be delivered by a single firm acting alone. It is produced through coordinated effort.

Although the empirical focus is the Indonesian cocoa industry, the implications extend more broadly to emerging economy supply chains facing similar sustainability pressures. Firms seeking long-term resilience should not treat sustainability as an isolated technical project. It requires relational investment, institutional engagement, and governance structures that allow internal capabilities to generate collective impact. Sustainable business performance, therefore, is not simply a function of internal excellence. It reflects how effectively firms participate in and shape collaborative systems.

Funding Statement

This research was financially supported by the Indonesia Endowment Fund for Education (LPDP), Ministry of Finance of the Republic of Indonesia, through doctoral scholarship funding. The funding institution did not influence the study design, data collection, data analysis, interpretation of findings, or preparation of the manuscript.

Institutional Review Board Statement

The study involved human participants and received ethical approval from the Ethics Committee of Universitas Pendidikan Indonesia. All procedures were conducted in accordance with institutional ethical standards and applicable research regulations.

Informed Consent Statement

Prior to participation, all respondents provided informed consent. Participation was voluntary, and confidentiality was ensured through anonymization of all responses.

Data Availability Statement

The dataset generated and analyzed during this study is available from the corresponding author upon reasonable request, subject to ethical and confidentiality considerations.

Authors' Contributions

Asni Mustika Rani initiated and designed the study, coordinated the research process, conducted data collection and analysis, and drafted the manuscript.

Agus Rahayu, Lili Adi Wibowo, and Alfira Sofia contributed to strengthening the theoretical framework, refining the research model, and enhancing analytical consistency.

Umari Abdurrahim Abi Anwar provided critical methodological insights and substantive revisions that improved clarity and academic rigor.

All authors reviewed the manuscript and approved the final version for submission.

Acknowledgements

The author wishes to express sincere appreciation to the Indonesia Endowment Fund for Education (LPDP), Ministry of Finance, Republic of Indonesia, for the academic and financial support provided during the doctoral study period, which enabled the completion of this research and manuscript.

Disclosure of AI Use
The authors used OpenAI's ChatGPT solely for language-editing purposes to improve clarity and grammatical accuracy. The tool did not contribute to data analysis, interpretation, or the development of scientific arguments. All content was fully reviewed and finalized by the authors.

Transparency Statement
The corresponding author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported. No important aspects of the study have been omitted, and any deviations from the original research plan have been appropriately explained.

Conflicts of Interest
The authors declare no conflict of interest.

Citations Policy Compliance Statement
The authors confirm that all citations included in this manuscript are directly relevant to the study's content and context. Excessive self-citation has been avoided, and references have been selected to ensure balance, accuracy, and ethical appropriateness in accordance with the journal's publication ethics policy.

References

Abbasi, M., & Nilsson, F. (2016). Developing environmentally sustainable logistics. Exploring themes and challenges from a logistics service providers' perspective. Transportation Research Part D: Transport and Environment, 46, 273–283. https://doi.org/10.1016/j.trd.2016.04.004

Anwar, U. A. A., Rahayu, A., Wibowo, L. A., Sultan, M. A., Aspiranti, T., Furqon, C., & Rani, A. M. (2025). Supply chain integration as the implementation of strategic management in improving business performance. Discover Sustainability, 6(1). https://doi.org/10.1007/s43621-025-00867-w

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Beske, P. (2012). Dynamic capabilities and sustainable supply chain management. International Journal of Physical Distribution and Logistics Management, 42(4), 372–387. https://doi.org/10.1108/09600031211231344

Beske, P., & Seuring, S. (2014). Putting sustainability into supply chain management. Supply Chain Management, 19(3), 322–331. https://doi.org/10.1108/SCM-12-2013-0432

Boeske, J. (2023). Leadership towards Sustainability: A Review of Sustainable, Sustainability, and Environmental Leadership. Sustainability (Switzerland), 15(16). https://doi.org/10.3390/su151612626

BPS – Statistics Indonesia. (2024). Indonesia Cocoa Statistics 2023 (Vol. 8). https://www.bps.go.id/id/publication/2024/11/29/ed255af0c9059f288fb7e1de/statistik-kakao-indonesia-2023.html

Camilleri, M. A. (2017). Corporate sustainability and responsibility: creating value for business, society and the environment. Asian Journal of Sustainability and Social Responsibility, 2(1), 59–74. https://doi.org/10.1186/s41180-017-0016-5

Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: Moving toward new theory. International Journal of Physical Distribution and Logistics Management, 38(5), 360–387. https://doi.org/10.1108/09600030810882816

Christopher, M., & Peck, H. (2004). Building the Resilient Supply Chain. The International Journal of Logistics Management, 15(2), 1–14. https://doi.org/10.1108/09574090410700275

Dariah, A. R., Rani, A. M., Sundaya, Y., & Abdullah, R. (2025). Sustainable business practices in Indonesia and Brunei Darussalam: awareness or innovation? Discover Sustainability, 6(1). https://doi.org/10.1007/s43621-025-01028-9

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited institutional isomorphism and collective rationality in organizational fields. American Sociological Review, 48(2), 147–160. https://doi.org/10.1016/S0742-3322(00)17011-1

Direktorat Jenderal Perkebunan. (2024). Statistik Perkebunan Jilid I 2022-2024. https://ditjenbun.pertanian.go.id/buku-statistik-perkebunan-jilid-i-2022-2024/

Dubey, R., Bryde, D. J., Dwivedi, Y. K., Graham, G., Foropon, C., & Papadopoulos, T. (2023). Dynamic digital capabilities and supply chain resilience: The role of government effectiveness. International Journal of Production Economics, 258(April), 108790. https://doi.org/10.1016/j.ijpe.2023.108790

Dubey, R., & Gunasekaran, A. (2016). The sustainable humanitarian supply chain design: agility, adaptability and alignment. International Journal of Logistics Research and Applications, 19(1), 62–82. https://doi.org/10.1080/13675567.2015.1015511

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? Strategic Management Journal, 21(10–11), 1105–1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11<1105::AID-SMJ133>3.0.CO;2-E

Elkington, J. (1997). Cannibals with Forks: The Triple Bottom Line of 21st Century Business. Capstone Publishing Limited. https://www.sdg.services/uploads/9/9/2/1/9921626/cannibalswithforks.pdf

Foerstl, K., Azadegan, A., Leppelt, T., & Hartmann, E. (2015). Drivers of Supplier Sustainability: Moving Beyond Compliance to Commitment. Journal of Supply Chain Management, 51(1), 67–92. https://doi.org/10.1111/jscm.12067

Food and Agriculture Organization of the United Nations (FAO). (2024). Indonesia: Upgrading bulk cocoa into fine cocoa. Regional Knowledge Platform on One Country One Priority Product (OCOP) in Asia and the Pacific. https://www.fao.org/one-country-one-priority-product/asia-pacific/good-practices/detail/indonesi-upgrading-bulk-cocoa-into-fine-cocoa/en

Freeman, R. E. (2010). Strategic Management: A Stakeholder Approach. Cambridge University Press. https://www.cambridge.org/core/product/identifier/9781139192675/type/book

Gandhi, G. (2023). Industri Pengolahan Cokelat Indonesia No. 3 Dunia, Kemenperin Pacu Daya Saing. https://www.tempo.co/ekonomi/industri-pengolahan-cokelat-indonesia-no-3-dunia-kemenperin-pacu-daya-saing-226611

Goyal, P. A., Khan, P., & Goud, P. V. (2024). Investigating The Role Of Sustainable Leadership In Driving Organizational Sustainability. Educational Administration: Theory and Practice, 30(5), 4094–4100. https://doi.org/10.53555/kuey.v30i5.3574

Gray, B., & Stites, J. P. (2013). Sustainability through Partnerships: Capitalizing on Collaboration (pp. 1–109). Network for Business Sustainability. https://nbs.net/wp-content/uploads/2022/01/NBS-Systematic-Review-Partnerships.pdf

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM). In Women Entrepreneurs (3rd ed.). SAGE Publications.

Hall, J., & Wagner, M. (2012). Integrating sustainability into firms' processes: Performance effects and the moderating role of business models and innovation. Business Strategy and the Environment, 21(3), 183–196. https://doi.org/10.1002/bse.728

Hart, S. L., & Dowell, G. (2011). A Natural-Resource-Based View of the Firm: Fifteen Years After. Journal of Management, 37(5), 1464–1479. https://doi.org/10.1177/0149206310390219

Hong, J., Zhang, Y., & Ding, M. (2018). Sustainable supply chain management practices, supply chain dynamic capabilities, and enterprise performance. Journal of Cleaner Production, 172, 3508–3519. https://doi.org/10.1016/j.jclepro.2017.06.093

Klassen, R. D., & Vereecke, A. (2012). Social issues in supply chains: Capabilities link responsibility, risk (opportunity), and performance. International Journal of Production Economics, 140(1), 103–115. https://doi.org/https://doi.org/10.1016/j.ijpe.2012.01.021

Krause, D. R., Handfield, R. B., & Tyler, B. B. (2007). The relationships between supplier development, commitment, social capital accumulation and performance improvement. Journal of Operations Management, 25(2), 528–545. https://doi.org/10.1016/j.jom.2006.05.007

Najjar, M., Yasin, M. M., Bell, M. Z., & Bell, D. (2024). Investigating social sustainability practices in global supply networks: A fuzzy-set qualitative comparative analysis. Journal of Cleaner Production, 447, 141590. https://doi.org/https://doi.org/10.1016/j.jclepro.2024.141590

Nugraha, D., & Hitchins, R. (2021). Public-Private Development Partnerships in commodity sectors: a case study from Indonesia: Vol. Sustainabl. https://www.springfieldcentre.com/sustainable-cocoa-production-program-scpp-case-study-series-no-1/

Pagell, M., & Wu, Z. (2009). Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars. Journal of Supply Chain Management, 45(2), 37–56. https://doi.org/10.1111/j.1745-493X.2009.03162.x

Seuring, S., & Gold, S. (2013). Sustainability management beyond corporate boundaries: From stakeholders to performance. Journal of Cleaner Production, 56, 1–6. https://doi.org/10.1016/j.jclepro.2012.11.033

Teece, D. J. (2018). Business models and dynamic capabilities. Long Range Planning, 51(1), 40–49. https://doi.org/10.1016/j.lrp.2017.06.007

Teece, D. J. (2023). The Evolution of the Dynamic Capabilities Framework ... In Artificiality and Sustainability in Entrepreneurship Exploring (pp. 113–129). Springer. https://doi.org/10.1007/978-3-031-11371-0_9

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. Strategic Management Journal, 18(7), 509–533. https://doi.org/10.1177/0269094218765167

Vachon, S., & Klassen, R. D. (2006). Extending green practices across the supply chain: The impact of upstream and downstream integration. International Journal of Operations and Production Management, 26(7), 795–821. https://doi.org/10.1108/01443570610672248

Zhu, Q., Sarkis, J., & Lai, K. hung. (2008). Confirmation of a measurement model for green supply chain management practices implementation. International Journal of Production Economics, 111(2), 261–273. https://doi.org/10.1016/j.ijpe.2006.11.029