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Social Capital and Supplier Adaptation of Social and Environmentally Sustainable Practices

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ABSTRACT

Firms in emerging nations face significant challenges in integrating environmental and social considerations into their supplier operations. Weak institutional frameworks, limited government support, resource constraints, high initial capital costs, a lack of expertise and restricted access to financial institutions often compound these challenges. Our study examines how adequate buyer–supplier social capital, characterised by trust, mutual respect, shared values and open communication, enhances socially and environmentally sustainable practices adoption. While the role of social capital in facilitating collaboration, knowledge exchange and innovation is recognised, its impact on suppliers' adoption of sustainable practices still needs to be explored. Our research focuses on manufacturing firms in Kenya—a representative context that exemplifies the challenges and opportunities in developing economies. Survey data from 233 manufacturing firms reveal that structural social capital significantly enhances suppliers' social and environmental sustainability. Relational social capital significantly influences suppliers' adoption of sustainable practices, but only when reciprocity and mutual friendship are strong. Conversely, cognitive social capital has a limited effect on adopting these practices. These findings provide new insights into sustainable supply chain implementation dynamics in developing countries and highlight the roles of various forms of social capital in promoting sustainability.

1 | Introduction

The increasing interest in environmental regulations and stakeholder pressures has led to companies incorporating sustainability into their supply chain management strategies to gain a competitive edge (Aragón-Correa, Marcus, and Vogel 2020; Meixell and Luoma 2015). However, while firms race to gain a competitive advantage through sustainability, weak institutions, supplier knowledge gap and resource constraints pose hidden barriers that multinational corporations' strategies in emerging nations fail to address (Ademi, Sætre, and Klungseth 2024; Tukuta and Saruchera 2015; Wohlgezogen et al. 2021). Industry 4.0 technologies and circular economy (CE) principles offer opportunities for improved productivity and promoting sustainable practices (Awan et al. 2022). However, firms in developing economies face barriers to adopting such tools due to limited access to digital infrastructure. As a result, reliance on technology can not necessarily resolve social challenges in business processes. Adopting sustainable practices in developing economies requires complementary efforts in capacity building, collaboration, trust building, financial incentives and behavioural change. A collaborative governance structure that aligns sustainability goals with local business realities is critical (Awan, Sroufe, and Shahbaz 2021; Sinkovics et al. 2021). A governance structure built on trust, mutual respect and shared ownership can help suppliers meet their sustainability goals by substituting for or complementing digital tools.

Collaboration, trust and strong ties within supply chain networks are key for successfully adopting CE and other

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sustainable practices. However, the governance structure for most global value chains (GVCs) only sometimes facilitates such relationships (Awan et al. 2022). Social capital (SC) theory suggests that strong interfirm ties can promote cooperation and knowledge sharing, enabling suppliers' adoption of sustainable practices in resource-constrained environments (Chowdhury et al. 2024). However, the extent to which SC affects suppliers' adoption of sustainable practices remains inadequately explored. Existing research on SC in supply chains has primarily concentrated on its impact on organisational performance outcomes rather than on supplier–buyer relationships and adoption of sustainable practices (Chowdhury et al. 2024). These studies focus on areas such as SC and local supplier exploitation and exploratory learning (Ha 2021; Wang et al. 2017), knowledge sharing (Appiah and Obey 2023), resilience (Jääskeläinen, Korhonen, and Amiri 2023) and reducing opportunism behaviour (Alghababsheh and Gallear 2020). As a result, limited research explores the impact of SC on the dyadic interaction between firms and suppliers.

Furthermore, scholars still need to fully explore the heterogeneity of SC in terms of social and environmental responsibilities and their related outcomes. The influence of SC may not be the same across different social and environmental sustainability outcomes. Structural, relational and cognitive SC each plays unique roles in driving social and environmental sustainability practices (Hung, Chen, and Chung 2014; Ozgun et al. 2022). However, their specific impact on suppliers' adoption of social and environmentally sustainable practices remains unexplored (Chowdhury et al. 2024). Gaining a more profound insight into how various aspects of SC affect diverse long-term outcomes is essential. Our study aims to deepen our understanding of the distinct roles played by structural, relational and cognitive SC in adopting sustainable practices, highlighting a perspective that has been insufficiently explored in existing literature. We aim to elucidate how supply chain initiatives can leverage these forms of capital more effectively.

Secondly, there is a significant gap in understanding the role of home and host country environments in shaping sustainability practices within the GVCs (Awan et al. 2022). Sustainability research primarily centres around developed countries, where organisations operate under strong regulatory frameworks (Millar and Russell 2011; Shubham, Charan, and Murty 2018). Firms in emerging nations face significant barriers such as weak institutions, resource constraints and limited expertise that hinder sustainable practices (Álvarez Jaramillo, Zartha Sossa, and Orozco Mendoza 2019; Khanna, Palepu, and Jayant 2005). Business practitioners and suppliers often lack a comprehensive understanding of sustainability (Wamalwa and Meyer 2024). According to institutional theory, including informal institutions such as supplier relationship management and SC (Knowles 2005) can help effectively address such institutional voids and a lack of resources in developing economies (Barbalet 2023; Puffer, McCarthy, and Boisot 2010). Therefore, based on the challenges above, we propose that the influence of SC on suppliers' adoption of sustainable supply chain practices is anticipated to be more substantial in developing nations than in developed countries. Therefore, an examination of the influence of SC on suppliers' adoption of sustainable advantage would provide valuable insights into the implementation of sustainable supply chains in emerging countries such as Kenya. However, there is a noticeable lack of sustainability research in the management literature, especially in developing economies that are disproportionately affected by its impact (Berrone et al. 2023; Hong et al. 2022). Therefore, further research on sustainability in developing economies is necessary, as the theories and policies formulated in developed economies may not be suitable in this particular context (Wamalwa and Meyer 2024). By examining the unique contributions of structural, relational and cognitive SC, our study highlights how SC provides a sustainable mechanism for overcoming institutional voids, resource constraints and knowledge gaps in developing economies, enabling firms to better their social and environmental goals.

Finally, our study makes a substantial methodological contribution to the current body of research on sustainability. Prior research often combines social and environmental metrics, which risk theoretical ambiguity (Alghababsheh and Gallear 2021; Awan et al. 2022). This study evaluates their performance better to understand their unique impacts on the supply chain (Awan et al. 2022). We carry out an independent examination of both social and environmental performance, which allows for a more precise understanding of the results. This study addresses the research gap guided by the following research questions:

- What is the influence of SC between buyers and suppliers on suppliers' adoption of socially sustainable practices?
- What is the influence of SC between buyers and suppliers on the extent to which suppliers implement environmentally friendly practices?

2 | Theoretical Consideration and Hypothesis Development

Our study explores how structural, relational, and cognitive SC influences suppliers' adoption of social and environmentally sustainable practices in developing economies. By focusing on supply chains in these contexts, we examine how firms can leverage SC to address resource scarcity, limited expertise, inadequate infrastructure and institutional voids, thus contributing to sustainable supply chain management (SSCM) practices.

2.1 | SC Theory

SC refers to the network of relationships, shared norms, values and trust that enable individuals or groups to work together effectively to achieve common goals and objectives. It denotes resources embedded in these social connections and relationship networks (Adler and Kwon 2002). These networks facilitate collective actions and provide a collectively owned capital that entitles individuals or organisations to credit in various ways (Alghababsheh and Gallear 2020). SC fosters cooperation, trust and information exchange, serving as a substitute and complement to other forms of capital, enabling firms to navigate

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resource constraints in developing economies (Appiah and Obey 2023). Individuals and organisations who lack financial resources and human skills can still be successful by having strong and valuable connections, which compensate for their limitations and provide additional support. These connections can also enhance the productivity of economic capital by reducing transaction and monitoring costs. SC is intricately woven into the fabric of social relationships.

Nahapiet and Ghoshal (1998) propose three dimensions of SC: cognitive, relational and structural. The structural social capital (SSC) dimension focuses on the strengths and numbers of ties between actors and the general patterns of connection between partners in terms of presence, frequency and strength of social interaction (Alghababsheh and Gallear 2020). Formalised networks and frequent information exchange characterise it and provide a foundation for environmental and socially sustainable practices through improved knowledge transfer and collaborative innovation (Nahapiet and Ghoshal 1998; Revilla and Knoppen 2015).

Relational social capital (RSC) is a multidimensional notion that encompasses the trust, obligation, identity, respect and friendship that exist in partner relationships (Wang et al. 2017). It leverages goodwill that exists between actors through repeated interactions. RSC builds on trust and reciprocity and fosters social responsibility initiatives, such as fair labour practices and ethical sourcing (Alghababsheh and Gallear 2021; Gualandris and Kalchschmidt 2016).

Cognitive social capital (CSC) refers to the shared goals, values, norms and understanding that enable individuals or organisations to collaborate effectively. CSC also involves reciprocal expectations regarding the goodwill and trustworthiness of exchange partners (Wang et al. 2017). The cognitive capital component denotes resources that provide shared representation, interpretation and meaning systems. It emerges when partners share a common language, codes, culture, business philosophy, goals and vision, fostering mutual understanding and alignment. It represents reciprocal expectations and similar perceptions, allowing buyers and suppliers to discover what is familiar and appropriate. Cognitive social capital (CSC), characterized by shared norms and values, aligns with buyer-supplier motivations, potentially leading to stronger adherence to sustainability goals (Silva, Ashby, and Nascimento 2023; Wang et al. 2017). These dimensions, therefore, offer distinct ways to sustain sustainability, warranting more nuanced exploration in the context of emerging economies.

SC has proven to be a valuable framework for comprehending the dynamics of buyer–supplier relationships and implementing knowledge management practices (Appiah and Obey 2023). Previous studies have suggested that SC is an efficient intervening mechanism for the buyer to manage the buyer–supplier relationship towards its performance goals (e.g., Li et al. 2022). SC provides a comprehensive framework for understanding relationships and dynamics, fostering trust and goodwill between buyers and suppliers (Li et al. 2022). It plays a crucial role in supporting and enhancing effective SSCM by facilitating knowledge exchange, promoting learning, fostering resilience, encouraging innovation and mitigating opportunistic behaviour (Lee 2015; Wang et al. 2017).

This study contributes to the body of knowledge by differentiating the roles of structural, relational and cognitive SC in driving social and environmentally sustainable practices within the supply chain. By focusing on buyer–supplier dyadic relationships, we address a significant gap in understanding how SC can overcome resource constraints, lack of knowledge and expertise, and institutional weaknesses to promote sustainable development. SSC fosters governance, information exchange and compliance with sustainability standards; RSC builds trust, reduces opportunism behaviour and supports continuous learning. CSC enhances shared norms and values and facilitates collaboration on sustainability issues.

2.2 | Hypothesis Development

SSC empowers businesses to influence suppliers to embrace socially responsible practices by establishing a framework for governance, collaboration, knowledge creation and sharing (Sukoco, Hardi, and Qomariyah 2018). It also enables purchasing firms to oversee suppliers' ethical conduct and adherence to human rights and other labour standards, ensuring social sustainability throughout the supply chain (Acquah et al. 2024). To enhance SSCM between buyers and suppliers, both parties should actively develop SSC by sharing information and expertise, allocating resources effectively, and demonstrating commitment. However, building such a commitment is challenging due to uncertainty, cultural discrepancies and concerns about opportunistic behaviour and information gaps between buyers and suppliers (Alghababsheh and Gallear 2021; Ciliberti, Pontrandolfo, and Scozzi 2008). Social interactions and interpersonal relationships within social networks bridge these gaps, reduce uncertainty, enable knowledge exchange and resolve workplace flaws (Kim, Lee, and Lee 2017; Nahapiet and Ghoshal 1998).

To achieve mutual benefits between buyer and supplier relationships, SSC is crucial. This includes interorganisational activities such as sharing information, organising social events, conducting team-building exercises, facilitating joint problem-solving workshops and establishing cross-functional teams. SSC embedded in buyer–supplier relationships is a valuable resource that helps organisations. These practices help address supplier social failure, increase cooperation between buyers and suppliers, facilitate collaboration, collective action and information sharing, and reduce opportunism in the dyadic relationship (Alghababsheh and Gallear 2021; Lioliou and Zimmermann 2015), hence supporting the adoption of socially responsible practices among suppliers. We argue that regular interactions between buyers and suppliers at various levels enhance access to accurate information, issue resolution and streamlined processes. It reduces uncertainty, promotes transparent communication and encourages adherence to social rules of behaviour (Appiah and Obey 2023; Hung, Chen, and Chung 2014; Jiang 2009). SSC promotes effective knowledge exchange, broadens collaboration opportunities, minimises transaction costs, promotes social learning and influences suppliers to adopt sustainable practices. SSC also provides

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a framework for regulating supplier behaviour through code of conduct certifications (Johnson, Elliott, and Drake 2013; Yim and Leem 2013). This framework ensures compliance with social responsibilities. It also creates a collaborative environment where buyers and suppliers participate in joint problem-solving and co-create social sustainability solutions (Horn, Scheffler, and Schiele 2014). SSC enhances comprehension of labour standards, human rights practices and community development requirements. SSC also institutionalises incentives such as market access, more extended contracts or preferential terms for suppliers who adopt sustainable practices (Acquah et al. 2024; Johnson, Elliott, and Drake 2013).

Drawing on SC theory, we contend that SSC encourages suppliers to embrace social sustainability through the establishment of governance frameworks, the promotion of knowledge creation and sharing, the facilitation of collaborative decision-making and problem-solving, the establishment of incentives for suppliers who implement these practices and the implementation of monitoring systems. We therefore hypothesise the following:

H1a. *Structural SC in dyadic buyer–supplier relationships improves the social sustainability performance of the supplier.*

SSC significantly affects suppliers' adoption of environmental practices. Engaging in social interactions, such as technical exchanges, can improve the performance of sustainable supply chains by enabling knowledge sharing and fostering collaboration. Suppliers in developing economies often need help with their limited knowledge and information. This limitation hampers their ability to effectively tackle emerging environmental issues in their products and operations (Lee 2015). SSC is essential for enabling interactions between local suppliers and buyers, fostering robust relationships and granting access to valuable knowledge and resources (Revilla and Knoppen 2015). Buyers can proactively share their knowledge of environmental sustainability with local suppliers by utilising SSC. This involves offering training on environmentally sustainable practices, ultimately enhancing supply chain sustainability, quality and efficiency (Horn, Scheffler, and Schiele 2014; Revilla and Knoppen 2015). SSC enhances suppliers' reputations, attracts premium buyers and reduces resistance, motivating vendors to adopt sustainable practices (Qiao, Li, and Capaldo 2022).

We argue that implementing SSC in supplier relationship management (SRM) helps improve local suppliers' comprehension and recognition of external knowledge related to environmentally sustainable practices (Lee 2015). These interactions enhance their ability to acquire and apply knowledge about sustainability in their operations (Revilla and Knoppen 2015). The frequent interaction with suppliers also enables firms to promote collaboration and joint problem-solving, strengthening monitoring and compliance mechanisms among suppliers (Awaysheh and Klassen 2010; Tipu and Fantazy 2018). SSC increases visibility, which enables firms to enforce sustainable practices and hold non-compliant suppliers accountable. A well-established dyadic relationship built on trust between buyers and suppliers also reduces uncertainty in the relationship and lowers transaction costs (Li et al. 2022). This creates an environment for suppliers to experiment with sustainable practices without fear of opportunism from their partners (Qiao, Li, and Capaldo 2022).

Based on SC theory, we argue that SSC enables, reinforces and spreads sustainable practices among suppliers through better information sharing, knowledge creation, monitoring and collaboration; therefore, we hypothesise the following:

H1b. *Structural SC in dyadic buyer–supplier relationships enhances supplier environmental sustainability performance.*

RSC refers to the value created within a business relationship resulting from the collaboration between the firm and its partners (Miocevic 2016). RSC is formed through trust, respect, friendship and reciprocity over some time. Socialisation is key to developing trust within exchange relationships. Companies can build trustworthiness by engaging in interactions and transactions (Gelderman, Semeijn, and Mertschuweit 2016). Trust between buyers and suppliers enhances collaboration, collective action, operational efficacy and cooperative behaviour, reducing transaction costs (Alghababsheh and Gallear 2021; Kim, Lee, and Lee 2017). By leveraging this relational capital, businesses can enhance their relationships with suppliers and provide the necessary support to mitigate risks associated with investing in supplier capability development (Frankowska and Cheba 2021). Trust and close interaction with supply chain partners lead to relationship learning and enable the institutionalisation of knowledge in relationship structures and working procedures (Alghababsheh and Gallear 2021).

Trust also reduces governance costs, facilitates the adaptation of sustainable supply chain relationships and enhances knowledge transfer between the organisation and its suppliers (Gualandris and Kalchschmidt 2016). RSC also contributes to improved sustainability performance, as the buying firm's involvement in corporate social responsibility (CSR) and adherence to the social code of ethics send essentials to suppliers about its trustworthiness, expectations and ethical principles (Jiang 2009). This, in turn, implies to suppliers the level of trustworthiness and the specific requirements that the company anticipates from them. RSC promotes favourable and moral ethical conduct among suppliers. Suppliers can enhance their success by partnering with buying firms that prioritise CSR development or possess relevant expertise. This collaboration can help them tackle complex CSR challenges and provide valuable insights, fostering an environment for continuous learning and empowering them to tackle complex social issues (Fortis et al. 2018).

The strength and quality of personal relationships between buyers and suppliers significantly impact suppliers' adoption of sustainable practices. Trust, obligations, respect and friendship form the foundation of these relationships. These interactions improve their capacity to gain and utilise sustainability knowledge in operations. RSC enables suppliers to integrate existing knowledge with new knowledge effectively, leading to heightened commitment and the seamless implementation of socially sustainable practices. We therefore hypothesise the following:

H2a. *RSC will significantly affect supplier adoption social performance.*

We further argue that friendly and reciprocal relationships can incentivise suppliers to follow a manufacturer's lead in implementing environmentally sustainable practices (Chiappetta

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Jabbour, Mauricio, and de Sousa Jabbour 2017; Luthra, Garg, and Haleem 2015; Yu, Zhang, and Huo 2021). RSC adds value by facilitating the exchange of shared knowledge and understanding between buyers and suppliers (Appiah and Obey 2023). It promotes close communication and interaction between manufacturers and suppliers (Yu, Zhang, and Huo 2021). It also helps acquire information, boosts confidence in exchanging information and lowers transaction costs by improving the overall value of the relationship. This allows suppliers to understand the manufacturer's standards and requirements. Suppliers' RSC facilitates collaborations between a manufacturer and suppliers through relational building and information sharing, which can improve suppliers' adoption of environmentally sustainable practices (reuse and recycling, waste management) (Chiappetta Jabbour, Mauricio, and de Sousa Jabbour 2017; Luthra, Garg, and Haleem 2015; Yu, Zhang, and Huo 2021). Establishing RSC between buyers and suppliers provides the basis for suppliers' adoption of environmentally sustainable practices. Cultivating enduring and reliable partnerships with suppliers has the potential to bolster supplier dedication and incentivise them to improve their environmental competence (Alghababsheh and Gallear 2021; Blonska et al. 2013; Gualandris and Kalchschmidt 2016). Therefore, we propose the following hypothesis:

H2b. *Relational capital will have a significant effect on supplier environmental performance.*

CSC encompasses the shared mental framework, collective understanding, shared culture, business philosophy, goals and vision among network actors or parties in a relationship (Alghababsheh and Gallear 2020; Dias and Silva 2022; Nahapiet and Ghoshal 1998). CSC fosters common understanding, effective communication and information sharing, avoiding misunderstanding and information asymmetry (Jääskeläinen, Korhonen, and Amiri 2023). It promotes communication, collaboration, resource exchange, continuous improvement and a shared mindset, ensuring partners act ethically and do not exploit each other's weaknesses (Silva, Ashby, and Nascimento 2023; Wang et al. 2017). Shared goals and a sustainable culture encourage buyers and suppliers to collaborate rather than pursue their interests. This also helps to prevent undesirable opportunistic behaviours and promotes transparency and solutions (Daghar, Alinaghian, and Turner 2021). Sustainable behaviour guidelines and principles are easier to implement when both parties agree, ensuring consistency in action and decision-making. A shared consensus enhances the likelihood of suppliers successfully implementing these practices (Dias and Silva 2022; Gelderman, Semeijn, and Mertschuweit 2016). We propose that shared interpretations build mutual trust and commitment, which are essential for ethical behaviour and sustainability. Suppliers adopt sustainable practices more positively when there are shared norms, values, goals and visions in buyer–supplier relationships. This alignment enhances supplier engagement in socially sustainable practices, mainly when the buying firm actively participates in socially sustainable initiatives. The identification of suppliers with the social activities of the buying firm fosters trust, encourages assistance and cooperation and promotes the exchange of tacit knowledge among suppliers (Huang 2016). This, in turn, enhances buyer–supplier learning and a commitment to social initiatives such as labour rights, fair wages, community engagement and ethical behaviour.

Making sense of CSR and other social issues in organisations involves gradually developing the meaning and identity of CSR (Fortis et al. 2018) and other social responsibilities. Through collaborative communication and interpretive processes, partners codevelop a shared understanding of social responsibilities, building capacity to address complex social issues and create new learning capabilities (Cramer, Van Der Heijden, and Jonker 2006). Inclusive sense-making is crucial for suppliers to develop shared understanding and collective processes, enabling them to address complex issues. This is most effective when alignment between company management and suppliers is achieved through structured collaboration, co-authoring reports, participating in stakeholder dialogues and expressing shared viewpoints to external stakeholders, including the public and media (Fortis et al. 2018). Stakeholder-inclusive approaches foster mutual trust and transparency and create coinnovation platforms where companies and suppliers collaboratively develop solutions that integrate diverse perspectives (Doten-Snitker et al. 2021).

Drawing on SC theory, we argue that CSC shapes suppliers' behaviour by establishing shared norms and expectations that guide appropriate supplier conduct. It also establishes the parameters for acceptable and expected behaviour from suppliers. Such shared meaning and understanding shape supplier behaviour and accordingly influences supplier adoption of a social code of conduct and responsibilities. This shared meaning and culture ensures that buyers and suppliers are accountable for their responsibilities, reinforcing mutual trust and relationships. Given the effects of SC on trust development, values alignment and effective collaboration, we therefore hypothesise the following:

H3a. *CSC positively impacts supplier adoption of sustainable social practices within their organisations.*

CSC strengthens buyer–supplier relationships by facilitating coordination for environmental goals and empowering suppliers to address complex sustainability issues through collaborative problem-solving (Dias and Silva 2022). It enables effective coordination and sharing of ideas, overcoming communication barriers caused by cultural and institutional differences in relationships (Silva, Ashby, and Nascimento 2023; Wang et al. 2017). Collaborative interorganisational relationships rooted in strong CSC reduce transaction costs and improve suppliers' adoption of sustainability practices (Daghar, Alinaghian, and Turner 2021).

When buyers and local suppliers have shared environmental sustainability goals or interests, the resulting synergy improves the exchange of resources and knowledge. This, in turn, fosters better understanding and increased interactions between buyers and suppliers. As a result, this fosters a more effective learning experience and promotes the exchange and combination of resources more efficiently (Wang et al. 2017). CSC between buyers and suppliers enhances the design and smooth implementation of environmental sustainability initiatives. CSC also establishes the opportunity to align their business philosophies and encourages the negotiation of congruent goals (Horn, Scheffler, and Schiele 2014). This is important as it ensures that suppliers and buyers pursue common environmental sustainability goals, reinforcing mutual commitment by both parties. Buying firms can influence suppliers' decisions by aligning their goals, values and visions through consistent communication (Carter and Liane Easton 2011; Horn,

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Scheffler, and Schiele 2014). Establishing shared norms and values with suppliers ultimately increases trust, strengthening long-term collaboration and sustainability performance. This trust is a foundation for long-term partnerships and strengthens the firm's overall sustainability performance.

Based on SC theory, we argue that shared norms and language decrease communication barriers between buyers and suppliers (Dias and Silva 2022). This facilitates the exchange of environmental knowledge and best practices while also encouraging collaborative problem-solving (Vurro, Russo, and Perrini 2009; Wang et al. 2017). This allows buyers and suppliers to work together on environmental solutions, ensuring that suppliers are actively involved in their environmental responsibilities and enhancing their capacity to adopt sustainable practices (Cramer, Van Der Heijden, and Jonker 2006). This also ensures that suppliers have sufficient and accurate, timely information about environmental regulations and market expectations, allowing them to be compliant and competitive (Gelderman, Semeijn, and Mertschuweit 2016). Considering the impact of CSC on effective communication, information sharing, learning and collaborative problem-solving, we thus hypothesise the following:

H3b. *CSC positively impact supplier adoption of environmentally sustainable practices within their organisations.*

Figure 1 presents a conceptual framework that guides the study. This conceptual framework illustrates the role of SC dimensions (structural, relational and cognitive) on suppliers' adoption of socially and environmentally sustainable practices. Contextual factors specific to developing economies, such as weak institutions, resource constraints and infrastructure limitations, interact with these dimensions to influence sustainable social and environmental outcomes.

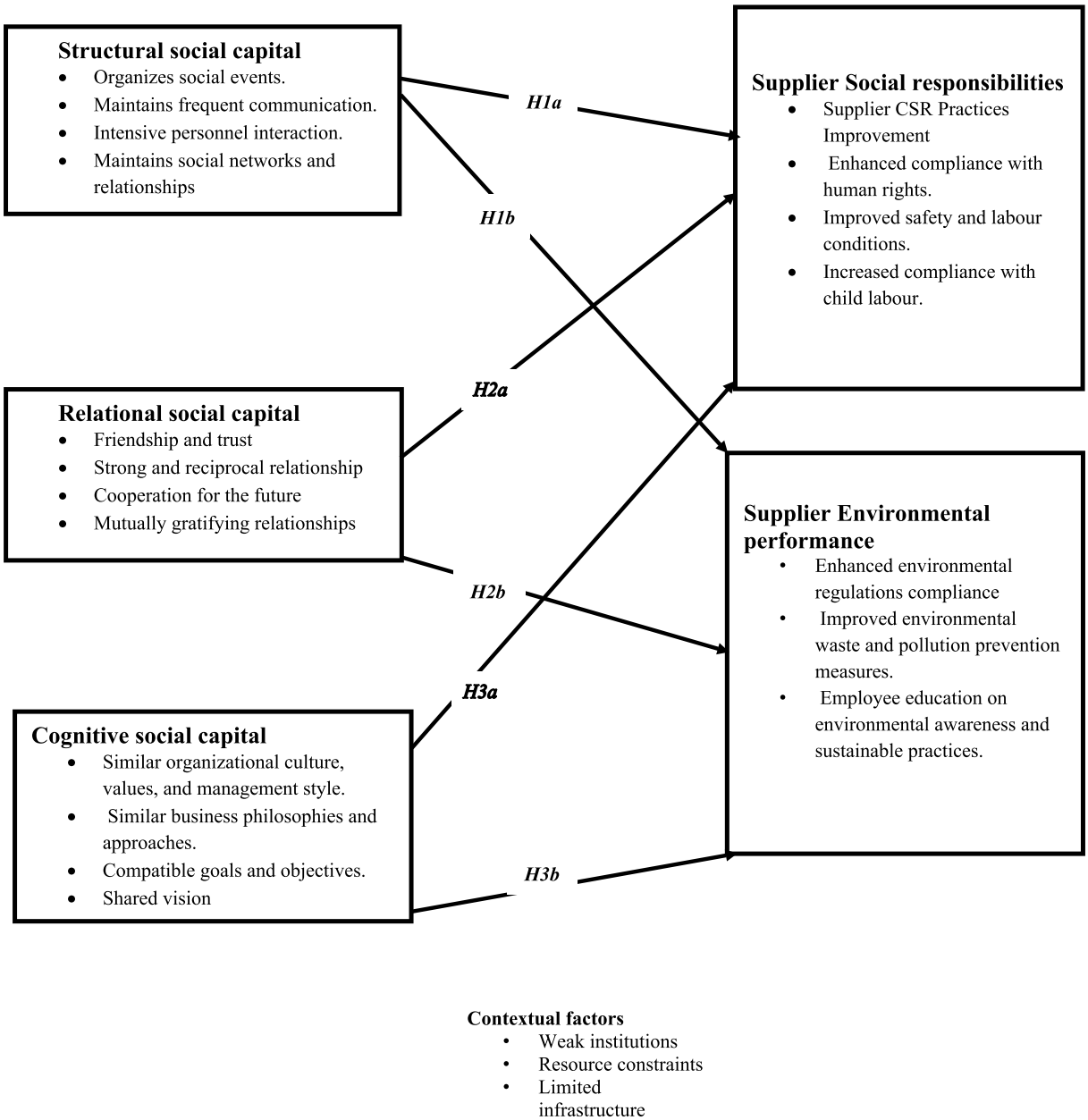

FIGURE 1 | Conceptual framework for the study.

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3 | Methodology

The study's population consisted of 640 manufacturing firms operating in Kenya. The firms varied in type, ranging from agricultural manufacturing to food processing firms to cement manufacturing firms. The study follows a cross-sectional, exploratory research design. We conducted a census study to provide comprehensive population insights into Kenya's manufacturing firms' entire population. The census approach enhances the study's external validity and reliability and provides a holistic understanding of complex supply chain networks and firm relationships (Fowler 2013). Prior researchers like Alghababsheh and Gallear (2021) have used the census approach to study SC in the supply chain and examine buyer–supplier relationships. This comprehensive data collection strengthens the reliability and applicability of our findings across the industry.

We collected data sets from different managers to reduce bias and enhance the reliability and validity of the research findings in data collection. Due to the low literacy level among some suppliers, such as smallholder farmers, we relied on procurement managers to provide us with the data (Wamalwa and Meyer 2024). We asked the procurement managers to evaluate six key suppliers based on their adoption of sustainable practices; we collected data on the independent variables from the operational officers or their equivalent (administrators) (Podsakoff et al. 2003). By leveraging insights from daily interactions with procurement officers and broader strategic goals from the operational manager, we ensured a comprehensive understanding of supply chain dynamics. This approach ensures that the data reflect multiple perspectives within the firm, minimising the risk of standard method and response bias.

Our response rate could have been much higher after following up with respondents via email, social media and telephone. We only received a total of 233 complete questionnaires. The response rate was 36.4%. Although the response rate is less than 50%, it is consistent with rates seen in studies conducted in similar contexts, particularly in developing economies where challenges such as resource constraints and access issues can affect participant levels (Baruch and Holtom 2008; Egbetokun 2022). To examine potential non-response bias in our study, we conducted a non-response bias test by categorising the respondents into three groups: early, middle and late. Early respondents ($n = 51$) provided feedback within the first week after the initial survey invitation, and late respondents ($n = 56$) responded only after follow-up efforts. We compared these groups across key variables related to relational, structural, cognitive, SC, and suppliers' social and environmental responsibilities.

We assessed the following specific variables: We participate in and plan social events with our suppliers, foster a relationship characterised by mutual friendship and have the same vision of business in the relationships. We also assessed the dependent variable supplier's adoption of social and environmental responsibilities. We used the independent-samples Mann–Whitney U test to test for categorical variables.

We analysed whether significant differences existed between data collected from early and late respondents. Table 1 presents our findings. The finding from this test shows no significant differences between the two categories of data. This provided insight into the representativeness of our sample, helping to ensure that our results accurately reflected the broader population despite the response rate limitations. We performed a t-test to validate these findings further and detect any subtle variation in means. In line with the Mann–Whitney U test, the t-test revealed no statistically significant difference in the mean responses between early and late respondents. This reinforces our confidence that non-response bias was minimal, suggesting the data represented the broader population under study. This provided insight into the representativeness of our sample, helping to ensure that our results accurately reflected the broader population despite the response rate limitations.

We also conducted the Herman single-factor test. The results revealed that the standard method bias was 35.884%. This suggests that common method bias is unlikely to pose a problem. Table 2 presents the descriptive statistics and correlation analysis of the data utilised.

3.1 | Characteristics of the Respondents

The male respondents accounted for 64% of the total, while the female respondents accounted for 36%. A total of 30.5% of the participants have achieved a master's or graduate degree, 41% have obtained a bachelor's degree and 28.5% possess a diploma or certificate in procurement or logistics. This indicates that the participants possessed a high level of education and were competent in completing the surveys. Seventy-three percent of the participants had a tenure of over 2 years in the organisation, while 20% had a tenure ranging from 1 to 2 years. Only 7% of the individuals had been with the organisation for less than 1 year. Therefore, we presumed that the participants fully understood the social and environmental sustainability performance of both the firm and its suppliers.

3.2 | Measurements

Our study methodology emphasises the independent assessment of structural, relational and cognitive SC dimensions to better capture their unique impact on supplier sustainable practices. By segmenting survey items to address each dimension individually, our approach enables us to analyse how each form of SC influences social and environmental outcomes differently.

Based on the literature (Nahapiet and Ghoshal 1998), there are three dimensions of SC: the cognitive refers to shared ambitions, vision and values; the relational SC dimensions are trust, identification and obligation; and the SSC relates to strengths and numbers of ties between actors. After reviewing the literature, we identified the following variables as our measurement variables (see Table 3). The RSC dimensions were measured using variables adapted from Wang et al. (2017). The variables used were 'We have developed friendship and trust with suppliers and encourage consultation', 'We have a strong and reciprocal relationship with our suppliers, and we are dedicated to maintaining these relationships', 'We expect to cooperate far into the future' and 'Our relationship with suppliers is mutually gratifying'. The measurement for SSC and CSC was adopted from Alghababsheh and Gallear (2021). The SSC

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TABLE 1 | Independent-samples Mann–Whitney *U* test.

Hypothesis test summary				
	Null hypothesis	**Test**	**Sig.*,[a]**	**Decision**
1	The variable 'We engage in and organise social events with our suppliers' has the same distribution across categories of data collection times.	Independent-samples Mann–Whitney *U* test	0.623	Retain the null hypothesis
2	The variable 'the relationship is characterised by mutual friendship' is the same across categories of time of data collection.	Independent-samples Mann–Whitney *U* test	0.780	Retain the null hypothesis
3	The variable 'We have the same vision of business in the relationships' is the same across categories of time of data collection.	Independent-samples Mann–Whitney *U* test	0.499	Retain the null hypothesis
4	The distribution of supplier social responsibility is the same across categories of data collection time.	Independent-samples Mann–Whitney *U* test	0.431	Retain the null hypothesis
5	The distribution of environmental responsibility is the same across categories of data collection time.	Independent-samples Mann–Whitney *U* test	0.803	Retain the null hypothesis

Independent-samples Mann–Whitney *U* test summary	
Total *N*	107
Mann–Whitney *U*	1495.000
Wilcoxon *W*	3091.000
Test statistic	1495.000
Standard error	136.416
Standardised test statistic	0.491
Asymptotic sig. (two-sided test)	0.623

*The significance level is 0.050.
[a]Asymptotic significance is displayed.

variables used were 'We engage in and organise social events with our suppliers', 'we communicate frequently with our suppliers', 'we maintain frequent and intensive interaction between personnel' and 'we maintain social relationships and networks with our major suppliers'. The variables used under CSC were as follows: 'We have similar organisational culture/values and management style with suppliers', 'We have similar philosophies/approaches to business dealings', 'We have compatible goals and objectives with suppliers' and 'We have the same vision of business in the relationships'.

We controlled for firms' size, age, number of years the firm has been in operation and industry type. All the items were measured using a 5-point Likert scale (1 indicating *strongly disagree* and 5 indicating *strongly agree*). To measure the dependent variables, we used two sets of measures: suppliers' organisational involvement in social activities and suppliers' adoption of environmental sustainability practices. We used Chan's (2005) instruments to measure the independent variable (adoption of environmental sustainability practices), the variables used were supplier compliance with environmental regulations, environmental pollution prevention measures and environmental education for employees. To measure the second independent variable, the social performance of suppliers, we used the following variable adapted from Alghababsheh and Gallear (2021): supplier engagement in CSR activities, compliance with human rights policy, and improved safety and labour conditions.

4 | Data Analysis and Results

4.1 | Reliability and Validity

As shown in Table 3, the alphas and composite reliabilities for all of the factor constructs are higher than the commonly recommended 0.7, except for one variable, structural SC, which is 0.683 closer to 0.7. Therefore, this study ensures individual item reliability. The square root of AVE exceeds the correlation between the latent variables and every other variable, supporting discriminant validity.

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TABLE 2 | Descriptive statistics and correlation analysis.

		STD	Mean	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Size of organisation	1.7811	0.41438	1														
2	Industry type	3.4163	0.85253	−0.058	1													
3	Firms age	3.7554	0.85867	−0.030	−0.037	1												
4	We engage in and organise social events with our suppliers.	3.6524	0.56033	0.061	−0.003	−0.115	1											
5	We have frequent communication with our suppliers.	3.5966	0.58750	0.061	0.053	−0.145*	0.449**	1										
6	We maintain frequent and intensive interaction between personnel	3.4120	0.54316	−0.057	−0.028	−0.069	0.473**	0.172**	1									
7	We maintain social relationships with our major suppliers.	3.5536	0.57077	−0.141*	0.020	−0.101	0.294**	0.386**	0.304**	1								
8	The relationship is characterised by close interaction at multiple levels.	3.9270	0.78718	0.149*	−0.077	−0.148*	0.519**	0.328**	0.091	0.186**	1							
9	The relationship is characterised by mutual trust at multiple levels.	4.0558	0.79945	0.128	−0.003	−0.150*	0.563**	0.388**	0.076	0.234**	0.808**	1						

(Continues)

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TABLE 2 | (Continued)

		STD	Mean	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
10	The relationship is characterised by high levels of reciprocity.	3.8798	0.77302	0.079	0.011	−0.135*	0.411**	0.339**	0.036	0.191**	0.637**	0.708**	1					
11	The relationship is characterised by mutual friendship.	3.8927	0.73788	0.247**	−0.025	−0.137*	0.514**	0.337**	0.143*	0.213**	0.639**	0.675**	0.733**	1				
12	We have similar organisational culture/ values and management style with suppliers	4.4592	0.74817	0.034	−0.010	−0.126	0.434**	0.384**	0.137*	0.331**	0.372**	0.325**	0.342**	0.425**	1			
13	We have similar philosophies/ approaches to business dealings.	4.4464	0.72391	0.025	−0.023	−0.094	0.363**	0.385**	0.056	0.255**	0.375**	0.344**	0.358**	0.469**	0.893**	1		
14	We have goals and objectives that are compatible with those of our suppliers.	4.3648	0.67591	0.071	−0.033	−0.083	0.405**	0.318**	0.035	0.212**	0.504**	0.489**	0.488**	0.442**	0.690**	0.670**	1	
15	We have the same vision of business in the relationships.	4.3391	0.67663	−0.011	−0.022	−0.072	0.324**	0.313**	0.040	0.226**	0.338**	0.403**	0.375**	0.410**	0.738**	0.781**	0.661**	1

**Correlation is significant at the 0.01 level (two-tailed).
*Correlation is significant at the 0.05 level (two-tailed).

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TABLE 3 | Measurement variables.

Variable and items	Standardised factor loading	Cronbach's alpha	CR	AVE
Structural social capital (Alghababsheh and Gallear 2021)				
We engage in and organise social events with our suppliers.	0.793	0.679	0.803	0.512
We have frequent communication with our suppliers.	0.691			
We maintain frequent and intensive interaction between personnel.	0.695			
We maintain social relationships with our major suppliers.	0.684			
Relational social capital (Wang et al. 2017)				
We have developed friendship and trust with suppliers and encourage consultation.	0.877	0.903	0.932	0.776
We have a strong and reciprocal relationship with our suppliers, and we are dedicated to maintaining these relationships.	0.909			
We expect to cooperate in the near future.	0.873			
Our relationship with suppliers is mutually gratifying.	0.863			
Cognitive social capital (Alghababsheh and Gallear 2021)				
We have a similar organisational culture/values and management style to that of our suppliers.	0.930	0.919	0.943	0.806
We have similar philosophies/approaches to business dealings.	0.936			
We have goals and objectives that are compatible with those of our suppliers.	0.835			
We have the same vision of business in the relationships.	0.886			
Social responsibilities (Alghababsheh and Gallear 2021)				
Our suppliers engage in CSR practices.	0.907	0.943	0.959	0.854
We have improved compliance with human rights supplier facilities	0.916			
We have improved safety and labour conditions	0.943			
We have improved compliance with child labour employment in the supplier facilities	0.929			
Environmental performance (Chan 2005)				
Our suppliers have improved compliance with environmental regulations.	0.946	0.936	0.957	0.881
Our suppliers have improved compliance with environmental waste and pollution prevention measures.	0.944			
Our suppliers educate their employees on environmental awareness and sustainable practices.	0.926			

5 | Hypothesis Testing Results

5.1 | SC and Social Performance of Suppliers

Table 4 shows the results of hierarchal regression analysis for SC's influence on supplier social sustainability as a dependent variable. Hierarchical regression analysis is well suited to studies with multiple conceptually related predictors. However, it is hypothesised to have distinct impacts on outcomes because it allows researchers to enter variables in a specific order, enabling step-by-step analysis of each predictor's unique contribution. This method helps assess the incremental variance explained by each predictor while controlling other variables introduced in previous steps, thus providing a clear understanding of how each predictor independently and collectively affects the outcomes (Hayes and Matthes 2009). Model 1 in Table 4, presents the results of analysis of control variables on social performance of suppliers ($R^2 = 0.029$, $\Delta R^2 = 0.029$, $\Delta F = 2.307$). The regression

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TABLE 4 | Social capital and supplier adoption of social sustainable practices.

	Model 1				Model 2				Model 3				Model 4			
	Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients	
	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.
(Constant)	4.139	0.326		<0.001	0.201	0.399		0.615	−0.267	0.393		0.496	−0.651	0.412		0.116
Size of organisation	−0.038	0.102	−0.024	0.712	−0.014	0.079	−0.009	0.864	−0.032	0.079	−0.021	0.685	−0.019	0.079	−0.012	0.811
Industry type	0.037	0.050	0.049	0.454	0.027	0.038	0.035	0.480	0.030	0.036	0.039	0.416	0.034	0.036	0.044	0.347
Firm's age	−0.122	0.049	−0.161	0.014	−0.043	0.038	−0.057	0.255	−0.026	0.036	−0.035	0.469	−0.027	0.036	−0.036	0.451
We engage in and organise social events with our suppliers.					0.255	0.072	0.220	<0.001	0.103	0.082	0.089	0.211	0.071	0.084	0.062	0.396
We have frequent communication with our suppliers.					0.334	0.065	0.302	<0.0001	0.286	0.063	0.259	<0.001	0.273	0.063	0.247	<0.001
We maintain frequent and intensive interaction between personnel.					0.109	0.069	0.091	0.115	0.187	0.068	0.157	0.007	0.207	0.068	0.173	0.003
We maintain social relationships with our major suppliers.					0.319	0.064	0.280	<0.001	0.293	0.062	0.258	<0.001	0.273	0.062	0.240	<0.001

(Continues)

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TABLE 4 | (Continued)

	Model 1				Model 2				Model 3				Model 4			
	Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients	
	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.
The relationship is characterised by close interaction at multiple levels.									0.028	0.069	0.034	0.679	0.028	0.070	0.034	0.693
The relationship is characterised by mutual trust at multiple levels.									0.024	0.076	0.030	0.750	−0.001	0.079	−0.001	0.994
The relationship is characterised by mutual friendship.									0.218	0.066	0.259	0.001	0.196	0.067	0.233	0.004
The relationship is characterised by high levels of reciprocity.									−0.020	0.070	−0.022	0.779	−0.031	0.073	−0.035	0.675
We have a similar organisational culture/values and management style to that of our suppliers.													0.040	0.101	0.047	0.689
We have similar philosophies/approaches to business dealings.													−0.089	0.107	−0.099	0.405

(Continues)

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TABLE 4 | (Continued)

	Model 1				Model 2				Model 3				Model 4			
	Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients	
	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.
We have goals and objectives that are compatible with those of our suppliers.													0.062	0.072	0.064	0.388
We have the same vision of business in the relationships.													0.160	0.078	0.167	0.041
R	0.171[a]				0.671[b]				0.715				0.730			
R^2	0.029				0. 0.450				0.511				0.534			
Adjusted R^2	0.017				0. 0.433				0.486				0.501			
R^2 change	0.029				0.421				0.060				0.023			
F change	2.307				43.111**				6.799**				2.656**			

**Significant at the 0.05 level (two-tailed).

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weight for specific variables includes firms' age ($\beta = -0.161$, $p = 0.014$), industry type ($\beta = 0.049$, $p = 0.454$) and size of the organisation ($\beta = -0.024$, $p = 0.712$). This shows that the control variable has insignificant effects on suppliers' CSR practices.

Hypothesis 1a suggests that structural SC dimensions positively affect suppliers' socially sustainable performance. Our findings in Model 2 on Table 4 show that structural SC dimensions positively affect suppliers' adoption of social responsibility practices ($R^2 = 0.450$, $\Delta R^2 = 0.421$**, $\Delta F = 43.111$**). The regression weight for specific variables shows engagement in and organising social events with our suppliers ($\beta = 0.220$, $p = 0.001$) and frequent communication with our suppliers ($\beta = 0.302$, $p = 0.001$), maintaining frequent and intensive interaction between personnel ($\beta = 0.091$, $p = 0.115$) and maintain social relationship with our major suppliers ($\beta = 0.280$, $p = 0.001$). Thus, H1a is supported.

Hypothesis 2a suggests that RSC will have a positive significant effect on supplier adoption of socially sustainable practices. Our findings on Model 3 in Table 4 show that relational SC positively affects the adoption of social responsibility practices ($R^2 = 0.511$, $\Delta R^2 = 0.0601$, $\Delta F = 6.799$.). The regression weight for specific variables shows that the relationship is characterised by close interaction at multiple levels ($\beta = 0.034$, $p = 0.679$). The relationship is characterised by mutual trust at various levels ($\beta = -0.030$, $p = 0.750$) and high levels of reciprocity ($\beta =$-0.022, $p = 0.779$), thus insignificant effects on suppliers' social performance. However, with the RSC variable, the relationship is characterised by mutual friendship ($\beta = 0.259$, $p = 0.001$), which significantly positively affects the organisation's adoption of social practices. Thus, H2b is supported.

Hypothesis 3a posited that CSC will have a positively significant effect on suppliers' sustainable social performance. Analysis of Model 4 in Table 4 indicates that CSC has an observable effect on suppliers' adoption of social responsibility practices, with a substantial portion of variance explained ($R^2 = 0.534$, $\Delta R^2 = 0.023$**, $\Delta F = 2.656$). Nevertheless, when examining the regression weights for specific variables, it appears that respondents shared similar organisational cultures/values and management styles with their suppliers ($\beta = 0.047$, $p = 0.689$), as well as philosophies/approaches to business dealings ($\beta = -0.0099$, $p = 0.405$), and compatible goals and objectives ($\beta = 0.064$, $p = 0.388$). A notable exception was found in the alignment of vision within business relationships ($\beta = 0.167$, $p = 0.041$), which significantly influenced suppliers' sustainable social performance. However, due to the mixed effects observed across the different components of cognitive SC, H3a is not supported.

5.2 | SC and Environmental Performance

Model 1 includes a control variable. The results are presented in Table 5, Model 1 ($R^2 = 0.023$, $\Delta R^2 = 0.023$, $\Delta F = 1.767$). The regression weights for specific variables are firm age ($\beta = 0.063$, $p = 0.3397$), industry type ($\beta = -0.029$, $p = 0.661$) and size of organisation ($\beta = 0.131$, $p = 0.047$). [Correction added on 10 February 2025, after first online publication: The preceding sentence has been updated for clarity in this version.] This shows that the control variable, firms' age, significantly affects suppliers.

Hypothesis 1b suggests that structural SC dimensions positively affect supplier adoption of environmentally sustainable practices. Our findings, Model 2 on Table 4, show that structural SC positively affects supplier adoption of environmental sustainable practices ($R^2 = 0.326$, $\Delta R^2 = 0.303$, $\Delta F = 25.303$**).

The regression weight for specific variables shows. Two variables, 'We engage in and organise social events with our suppliers' ($\beta = 0.263$, $p = 0.001$) and 'We have frequent communication with our suppliers' ($\beta = 0.356$, $p = 0.001$), have positive significant effects on suppliers' adoption of environmentally sustainable practices. However, regarding the other two variables examined, it was observed that maintaining frequent and intensive interactions between personnel ($\beta = -0.023$, $p = 0.717$) and sustaining social relationships with major suppliers ($\beta = 0.081$, $p = 0.197$) did not yield statistically significant effects on the adoption of sustainable environmental practices by suppliers. Therefore, the findings indicate that Hypothesis 1b is supported, suggesting these forms of social interaction do not substantially influence environmental sustainability initiatives among suppliers.

Hypothesis 2b suggests that RSC will positively affect supplier adoption of environmentally sustainable practices. Our findings on Model 3 in Table 5 show that relational SC positively affects suppliers' ecologically sustainable practices ($R^2 = 0.407$, $\Delta R^2 = 0.081$, $\Delta F =$ 7.525**). The regression weight for the variables reveals that certain characteristics of the relationship between buyers and suppliers exhibit insignificant impacts on suppliers' environmental sustainability. Specifically, close interaction at multiple levels ($\beta = 0.099$, $p = 0.282$), mutual trust at various levels ($\beta = 0.016$, $p = 0.878$) and mutual friendship ($\beta = 0.003$, $p = 0.730$). However, a notable exception was observed for relationships characterised by high levels of reciprocity, which showed a significant positive effect ($\beta = 0.259$, $p = 0.003$). Consequently, the evidence supports Hypothesis 2b, indicating that high reciprocity within buyer–supplier relationships enhances environmental sustainability among suppliers.

Hypothesis 3b suggests that CSC will have a significant a positive effect on suppliers' sustainable environmental performance. Our findings on Model 4 in Table 5 show that cognitive SC significantly affects suppliers' environmental performance ($R^2 = 0.451$, $\Delta R^2 = 0.044$, $\Delta F = 4.394$.*). The regression analysis examining specific variables indicated that several elements did not considerably influence supplier ecological performance. Specifically, having similar organisational culture/values and management styles with suppliers ($\beta = 0.243$, $p = 0.061$), similar philosophies/approaches to business dealings ($\beta =$-0.142, $p = 0.081$) and a shared vision of business in the relationships ($\beta = 0.033$, $p = 0.792$) were found to have insignificant effects. Similarly, possessing compatible goals and objectives with suppliers was associated with an insignificant negative impact on supplier performance ($\beta = 0.115$, $p = 0.191$). Consequently, these results suggest that Hypothesis 3b is unsupported, as the anticipated positive impacts of alignment in organisational culture, philosophy and vision did not materialise, and compatible goals unexpectedly correlated with poorer performance.

To verify the study's reliability, we conducted various robust checks to ensure the results were held under different conditions. First, we tried an alternative statistics model, specifically

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TABLE 5 | Social capital and supplier engagement in environmentally sustainable practices. [Correction added on 10 February 2025, after first online publication: In Table 5, the values under Model 1, columns Beta and Sig., rows Size of organisation and Firms age have been updated in this version.]

	Model 1				Model 2				Model 3				Model 4			
	Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients	
	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.
(Constant)	3.631	0.309		<0.001	0.907	0.418		0.031	0.533	0.409		0.194	0.120	0.423		0.777
Size of organisation	0.193	0.097	0.131	0.047	0.155	0.083	0.105	0.063	0.053	0.082	0.036	0.518	0.100	0.081	00.068	0.219
Industry type	−0.021	0.047	−0.029	0.661	−0.034	0.040	−0.048	0.389	−0.024	0.038	−0.033	0.530	−0.020	0.037	−0.027	0.595
Firms age	−0.045	0.047	0.063	0.339	0.017	0.040	0.024	0.663	0.037	0.038	0.052	0.330	0.038	0.037	0.053	0.308
We engage in and organise social events with our suppliers.					0.288	0.075	0.263	<0.001	0.067	0.085	0.062	0.430	0.056	0.086	0.052	0.512
We have frequent communication with our suppliers.					0.372	0.068	0.356	<0.001	0.335	0.065	0.321	<0.001	0.282	0.065	0.270	<0.001
We maintain frequent and intensive interaction between personnel.					−0.026	0.072	−0.023	0.717	0.044	0.071	0.039	0.536	0.072	0.070	0.063	0.306
We maintain social relationships with our major suppliers.					0.087	0.067	0.081	0.197	0.048	0.064	0.044	0.458	0.031	0.064	0.029	0.631
The relationship is characterised by close interaction at multiple levels.									0.077	0.071	0.099	0.282	0.081	0.072	0.104	0.257

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TABLE 5 | (Continued)

	Model 1				Model 2				Model 3				Model 4			
	Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients	
	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.
The relationship is characterised by mutual trust at multiple levels.									0.012	0.079	0.016	0.878	0.026	0.081	0.034	0.744
The relationship is characterised by high levels of reciprocity.									0.024	0.069	0.030	0.730	0.054	0.068	0.068	0.431
The relationship is characterised by mutual friendship.									0.215	0.072	0.259	0.003	0.120	0.075	0.145	0.109
We have a similar organisational culture/values and management style to that of our suppliers.													0.206	0.109	0.243	0.061
We have similar philosophies/ approaches to business dealings.													−0.128	0.073	−0.142	0.081
We have goals and objectives that are compatible with those of our suppliers.													0.105	0.080	0.115	0.191

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TABLE 5 | (Continued)

	Model 1				Model 2				Model 3				Model 4			
	Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients		Unstandardised coefficients		Standardised coefficients	
	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.	B	Std. error	Beta	Sig.
We have the same vision of business in the relationships.													−0.027	0.103	−0.033	0.792
R	0.150				0.571				0.638				0.672			
R^2	0.023				0.326				0.407				0.451			
Adjusted R^2	0.010				0.0305				0.377				0.413			
R^2 change	0.023				0.303				0.081				0.044			
F change	1.767				25.303**				7.525**				4.394**			

**Significant at the 0.01 level (two-tailed).

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structural equation modelling, to examine whether the relationship between SC and sustainable outcomes remained consistent. Our findings showed no difference.

Second, we divided the sample into two subgroups based on the firm's size (large group and small firm). We carried out linear regression for the two groups, focusing on RSC and cognitive SC. For large and medium-sized firms, the findings remained the same. However, for small firms, we observed that relationships characterised by mutual friendship significantly affected environmental sustainability (B = 0.363, $p = 0.001$). Additionally, cognitive and social factors such as shared vision had an impact on environmental responsibilities (B = 0.221, $p = 0.022$) and social responsibilities (B = 0.670, $p = 0.008$) of small firms, while similar organisational culture and management style were associated with suppliers' social responsibilities (B = 0.484, $p = 0.038$). We also performed a sensitivity analysis test by adjusting variables and removing outliers to examine whether the unexpected or non-significant effects persisted. We also checked the measurement scales and how we operationalised them to see if that changed the results, but nothing changed.

6 | Discussion of Findings

Our findings suggest that firm size significantly influences supplier adoption of sustainable practices, while control variables firm age and industry type have little effect on suppliers' adoption of sustainable practices. Large firms face more significant stakeholder pressure to adopt environmentally sustainable practices than small firms due to their visibility (Liedong et al. 2015; Scherer 2017). At the same time, small firms leverage cognitive and RSC to drive sustainability. Small firms benefit due to close interpersonal connections, flexible organisational culture, and dependency on relational networks as a source of competitive advantage. Smaller firms adopted sustainable practices based on internal relationships and cultural flexibility, while larger firms responded to stakeholder pressures.

We examined why age, industry type and firm size showed mixed or insignificant effects on supplier adoption of socially and environmentally sustainable practices. We argue that older firms may have stable traditional practices and resist adopting socially sustainable initiatives due to institutional inertia. The varied motivation for adopting social sustainability makes the industry a weak predictor of firms adopting social responsibilities. Firms in the same sector may adopt different social duties based on their leadership style, resources and strategic priorities. Although large firms have more resources, their engagement with social sustainability practices may be more about compliance than genuine commitment, limiting the impact on suppliers. This suggests that the firm's social responsibilities are driven by organisational strategic intent and leadership rather than organisational characteristics like age, industry or size. External pressures, such as market expectations and stakeholder demand, may substantially influence social responsibilities more than internal factors. However, firm age emerged as a predictor of environmental sustainability as older firms have more experience and resources to invest in sustainable practices (waste reduction and energy efficiency), which require long-term investment and learning over time.

Our research indicates that SSC positively impacts suppliers' socially and environmentally sustainable performance. SSC shapes supplier behaviours, fosters sustainable activities and facilitates successful buyer–supplier collaboration. Continuous interaction fosters strong ties, knowledge exchange and the effective implementation of social and environmental practices. Our findings show that SSC dimensions, such as maintaining social relationships with our major suppliers, improve social sustainability but not ecologic sustainability. Our findings also show that frequent buyer–supplier interaction does not significantly affect supplier social and environmental sustainability. Differences between social and ecological sustainability can explain the discrepancies. Strong supplier relationships foster trust, respect and collaboration, which are necessary for supporting social sustainability initiatives like fair labour and community engagement. Strong relationships may not promote environmental practices requiring technical expertise and formal processes. Informal interactions may not transfer knowledge-specific skills and capabilities for ecological practices. Maintaining social relationships with major suppliers while being supportive may need more technical rigour and resources to improve the environment. Suppliers may view such employee interactions as routine business interactions rather than a sign of innovation or sustainability.

Our findings demonstrate that RCS significantly affects supplier adoption of environmentally and socially sustainable practices. High reciprocity significantly fosters structured exchanges essential for environmental sustainability, such as waste management, emissions reduction or energy efficiency initiatives. It eliminates ambiguity, enhances predictability and cultivates trust. For instance, a supplier may commit to reducing waste or emissions in exchange for a long-term contract or training.

This mutual commitment enables sharing costs, technical resources and knowledge, thereby enhancing the resource sharing and technical expertise essential for environmental practices.

Reciprocity in developing economies builds trust and provides a platform for resource-intensive sharing that enhances environmentally sustainable efforts. When buyers provide resources or incentives for ecologically sustainable practices, suppliers will likely reciprocate by investing in them. While relational norms and informal support may sustain social practices, reciprocity drives environmental practices that require a structured, ongoing exchange of resources and long-term commitment. Reciprocity strengthens a feeling of fairness and accountability, which can be especially crucial in executing long-term, resource-intensive environmental practices. Mutual friendship increases supplier adoption of socially sustainable practices by fostering trust and collaboration. It creates a collaborative atmosphere where social issues like fair labour practices and community engagement can thrive as they are often rooted in shared values and mutual relationships rather than formal exchanges. When suppliers and buyers share a friendly relationship, they are more likely to care about each other's well-being and the impact of their actions on the community. Friendship cultivates empathy and intrinsic motivation to act.

We argue that reciprocity and mutual friendship influence different aspects of sustainability. They foster distinct types of motivation and engagement between buyers and suppliers. While

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reciprocity drives environmental sustainability by promoting resource exchange and a result-oriented commitment to sustainable practices, mutual friendship fosters trust, ethical behaviour and a people-centred approach.

Our findings on CSC are contradictory to our expectations. While we anticipated that the buying firm and supplies have a shared culture, values and management style, similar philosophies/approaches to business dealings, compatible goals and objectives with suppliers will significantly affect suppliers' adoption of sustainable practices. Our findings show that only a shared vision between buyers and suppliers will impact supplier adoption of socially sustainable practices. However, it does not have an impact on environmental practices. We argue that this could be possible because a shared vision ensures that the buying firms and suppliers are committed to a similar ethical and social standard, reducing friction and misunderstandings. This also leads to mutual accountability for upholding social responsibilities. This mutual accountability encourages suppliers to meet high social standards consistently, knowing that the buyers value these practices as part of their shared vision. Buyers are also likely to support suppliers in maintaining these standards, such as fair pricing and long-term contracts. A shared vision also promotes long-term commitment in the relationship as buyers and suppliers are more likely to make socially beneficial investments, such as worker training, fair wages and safe working conditions that support sustainable community growth and well-being. However, a shared value did not influence environmental sustainability as the ecological goals required specific technical knowledge, resources and structural processes that go beyond shared values, goals and culture. Environmental responsibilities involve complex technical requirements such as reducing emissions, waste management and energy efficiency, which demand expertise and resources. Shared vision, culture, goals and philosophy may support the alignment of values but do not automatically equip suppliers with the technical knowledge and tools to implement environmental improvement.

7 | Theoretical Contribution

Our research draws upon SC theory to address significant gaps in understanding how SC influences supplier behaviour in developing economies. It contributes to the literature on SSCM by showing how RSC, CSC and SSC enhance suppliers' adoption of socially and environmentally sustainable practices.

Unlike prior research that focused on specific dimensions of SC (Chowdhury et al. 2024). We adopt a comprehensive approach by examining all three types of SC. At the same time, previous research has primarily concentrated on conventional outcomes such as strategic performance, operational performance, relationship learning, opportunity, knowledge sharing and integration (Alghababsheh and Gallear 2021). We focus on how SC influences (partner) suppliers' adoption of social and environmental performance. This expands the literature by shifting from firm-centric to partner outcomes.

Our study positions SC as a mechanism for addressing the institutional void in emerging economies. It demonstrates how informal institutions can replace formal governance systems to promote sustainable supply chain practices in weakly regulated environments. RSC and SSC promote trust-based relationships and frequent interactions, enabling buyers to share sustainability knowledge and expertise with suppliers. This helps overcome barriers, such as limited access to training and resources. Our findings add to the literature by identifying SC as a tool for building supplier capacity in settings where formal training resources may be scarce.

It bridges SC and institutional theory by presenting SC as a replacement for weak formal institutions. It broadens the influence of SC from firm-centric to partner-centric outcomes and introduces a novel theoretical pathway for achieving sustainability through SC. These deepen our understanding of sustainable supply chains in emerging economies and provide a comprehensive framework for further research into the role of SC in promoting sustainability within and beyond individual firms.

The study makes a significant methodological contribution to existing research on sustainability. We conduct a separate social and environmental performance analysis, enabling a more accurate interpretation of the outcomes. Addressing limitations in prior research that merged these constructs, we show that strategies for socially sustainable practices differ from those required for environmental practices. We emphasise the need to study them independently.

7.1 | Managerial Implications

Our study, rooted in the Kenyan manufacturing sector, provides insights applicable to other developing economies and sectors. Many developing economies need help to adopt sustainable practices across industries due to limited resources, institutional gaps, high illiteracy and poor infrastructure. Strengthening SC between buyers and suppliers can overcome resources and infrastructure limitations, leading to more sustainable and resilient supply chains. SC offers an alternative pathway to improve supplier sustainability and achieve broader development objectives.

While our study has focused on manufacturing firms, the findings apply across various industries. SC strengthens networks between farmers, buyers and agricultural cooperative societies in agriculture, fostering knowledge sharing and sustainability. To address sustainability, SC can also help implement sustainable material sourcing and waste reduction production practices in the construction industry. Globally, SC impact varies.

In Africa, where small and informal businesses play a critical role in the economy, SC often fills the gap left by weak institutions. In South Asia, its effects vary with institutional strengths. Countries like Singapore, with strong institutions, can use SC to improve sustainable practices. Cambodia, a country with limited resources and weak institutions, can leverage SC to enforce environmental standards through informal systems. In Latin American countries like Brazil, SC interacts with social movements focused on ecological justice and sustainability to ensure suppliers adopt sustainable practices that protect forests and the environment. In developed economies, however, institutional support, formal regulations and market structure often play a more significant role in promoting sustainability. SC may

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support sustainability, but its impact is less probable as formal institutions provide substantial incentives and frameworks.

Developing multinational corporations need help integrating environmental and social considerations into their supplier operations. SC can address institutional gaps and resource scarcity in developing economies, significantly influencing suppliers' adoption of sustainable supply chain practices. Therefore, managers in these countries must invest in and develop SC to foster a supportive environment that encourages suppliers to adopt socially and environmentally sustainable practices.

Buying firms should develop SSC, RSC and CSC strategies to motivate suppliers to adopt sustainable practices. This entails establishing robust partnerships with suppliers and promoting collaboration, trust, cooperation, commitment and knowledge sharing. In developing economies, SC plays a crucial role in fostering knowledge exchange between buyers and suppliers, allowing for sharing of expertise, experiences and ideas. This may create systems that will enable suppliers to adopt sustainable practices.

8 | Limitations of the Study

Our study needs to address the interconnectedness between cognitive, relational and structural SC. We argue that CSC arises from structural and relational SC, while its presence fosters commitment and trust in communication, strengthening both relational and structural SC. However, its absence will negatively impact supplier adoption of sustainable practices and cultural and cognitive SC. An important constraint of this study is its failure to account for the interdependence among the three forms of SC. Subsequent research should incorporate this factor.

Furthermore, while a non-response bias test reveals no significant differences between early and late respondents, the low response rate of 36.4% remains a limitation. Nonrespondents, particularly smaller firms or those with fewer established sustainable practices, may differ systematically from respondents, potentially over-representing firms already invested in SC and sustainability. Further studies could address these limitations by improving response rates and reducing the risk of non-response bias.

Our cross-sectional survey design captures data at a specific point in time. However, SC is a concept that evolves; its sustainable practices may require sustained long-term relationships, and cross-sectional data may only partially caption parties that fully understand SC's complexity over time. We recommended that future research employ a longitudinal survey. Finally, our study focuses on Kenya, which limits the results' applicability to different contexts. Hence, it is imperative to replicate the research in alternative environments to validate the findings across diverse environments.

9 | Conclusions

The study reveals the distinct roles that SSC, RSC and CSC play in fostering social and environmental responsibilities among suppliers. Through frequent communication and collaboration with suppliers, structural SC supports social and environmental sustainability practices. In contrast, relational capital, mainly through reciprocity and mutual friendship, promotes social and ecological outcomes. However, CSC influences social practices by fostering a shared vision, while its impact on ecologic practices is limited and requires technical expertise. This study adds to the body of research on sustainable supply chains by looking at all three aspects of SC together and showing how it can help emerging economies deal with a lack of resources, knowledge and institutions. We offer a pathway for sustainability goals through SC mechanisms.

Conflicts of Interest

The authors declare no conflicts of interest.

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