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Learning *About* and Learning *From* Sustainability Alliances: How Do SMEs Develop Dynamic Capabilities?

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ABSTRACT

This study examines how small and medium-sized enterprises (SMEs) develop sustainability capabilities by engaging in sustainability alliances. By combining perspectives on organisational learning theory and the dynamic capabilities framework, the research investigates how SMEs develop both networking and sustainability capabilities across different phases of the alliance lifecycle and what organisational learning mechanisms support their development. This study adopts a qualitative research design based on a multiple case study methodology, investigating five Italian SMEs active in the agri-food sector, with distinct organisational models and sustainability strategies. Results show that sustainability alliances evolve dynamically across alliance lifecycle stages, supported by different behaviours, tools, and roles. Organisational learning fosters the development of dynamic capabilities for sustainability, moving SMEs from operational eco-efficiency to systemic transformation, increasing their competitiveness.

1 | Introduction

In recent years, the business landscape has witnessed a paradigm shift towards sustainability driven by increasing environmental concerns, regulatory pressures and evolving consumer expectations (Delbridge et al. 2024). The rise of sustainability has expanded performance beyond economic success to include environmental and social dimensions. Achieving sustainable business performance therefore requires integrating these three aspects (Gimenez et al. 2012). This shift has pushed organisations to rethink not only their internal operations but also their inter-organisational relationships, as sustainability challenges extend beyond the boundaries and capacity of individual firms (Harrison et al. 2023; Frostenson and Prenkert 2015; De Bakker et al. 2019).

The challenges of sustainability are particularly heightened for small and medium-sized enterprises (SMEs), which constitute over 99.8% of firms in the European Union, employing 65.1% of employment and 53.6% of value-added (Schulze Brock et al. 2025). Despite their recognised agility and flexibility in pursuing sustainability-related opportunities (Hockerts and Wüstenhagen 2010; La Rocca and Dal Molin 2024), SMEs face resource constraints that limit their action (Lee et al. 1999; Fortis et al. 2018). Inter-firm cooperation has therefore emerged as a critical pathway for SMEs to overcome these constraints, with empirical evidence indicating that approximately 26% of firms identify cross-sector collaboration as key to improved resource efficiency (Eurobarometer 2022).

In this context, sustainability alliances—inter-organisational collaborations that focus on joint action for shared sustainability goals—are emerging as valuable mechanisms for addressing environmental and social challenges while overcoming resource limitations (Inigo et al. 2020; Hübel et al. 2022; Vurro et al. 2024). Alliances can take different forms, from informal collaborations to shareholding alliances (Gulati 2007) and follow a lifecycle that structures their development and operation. This lifecycle revolves around pre-formation, governance and post-formation activities (Inigo et al. 2020;

Kale and Singh 2009), which we further operationalise into Focus, Create, Manage and Sustain (Frączkiewicz-Wronka et al. 2024).

Managing these alliances presents firms with a dual challenge: they must develop capabilities for managing partnerships effectively while simultaneously leveraging alliances as platforms for developing sustainability competencies (Snell and Morris 2014). Central to this challenge is the distinction between two complementary types of learning. Learning about alliances refers to acquiring knowledge about the partners themselves—their resources, routines, strategic priorities and ways of collaborating. This type of learning supports the development of networking capabilities, as it enables firms to identify, establish, coordinate and sustain effective inter-organisational relationships. In contrast, learning from alliances involves extracting broader insights and best practices from the alliance as a whole, including operational improvements, sustainability innovations and knowledge that can be applied across the firm. This type of learning underpins the development of sustainability capabilities, helping firms integrate environmental and social considerations into strategic and operational practices. Networking capabilities are thus defined as an organisation's ability to identify, establish, coordinate and sustain relationships with external partners (Mitrega et al. 2012), thus enabling effective alliance management. Sustainability capabilities are defined as the firm's ability to integrate environmental and social considerations into its strategic decision-making and operational practices.

The high failure rate of alliances, estimated at around 60% (Dhaundiyal and Coughlan 2022), underscores the complexity of developing and deploying these capabilities effectively. This is especially evident in sectors characterised by resource constraints, such as the agri-food one, which is characterised by strong dependence on natural resources (Dias et al. 2022), a fragmented structure composed mainly of small-scale operators, and significant environmental and social impact (Jirapornvaree et al. 2022). The sector faces the challenge of ensuring food security while advancing sustainability in the context of climate change and biodiversity loss (Silvestri et al. 2023). As the current food system sits at the intersection of social, environmental and economic crises (El Bilali 2019), the sustainable development of this sector is recognised as a critical priority (Pender et al. 2014). Traditionally marked by limited knowledge management and low R&D intensity, agri-food firms increasingly rely on inter-organisational relationships to share and transfer knowledge (Vesperi and Coppolino 2023). The sector's complex issues and structural limitations call for specialised tools and policies developed through bottom-up, collaborative approaches (Fraser et al. 2006).

Despite growing interest in sustainability roles and competencies (Deloitte 2023), the academic literature remains underdeveloped in explaining how SMEs learn and develop capabilities specifically for sustainability-oriented alliances (Peterman et al. 2020). Understanding this gap requires examining the mechanisms through which learning unfolds across different stages of the alliance lifecycle and how organisational factors facilitate or hinder this process. The organisational learning perspective (Hermelingmeier and von Wirth 2021) provides a suitable theoretical lens for examining this dual challenge for two main reasons. First, the interaction between these capabilities presents a unique learning challenge, requiring firms to continuously adapt and refine their approaches based on partnership experiences while deepening their expertise in sustainable practices. Capabilities emerge through an iterative process, pointing to the nature of capability development as a learning process, shaped by both direct experience and inter-organisational knowledge exchange (Hübel et al. 2022), where learning about alliance partners dominates the early phases of the alliances, while learning from alliances dominates during the operational alliance phases (Das and Kumar 2007). Second, the development of both networking and sustainability capabilities heavily relies on the firm's ability to absorb and integrate knowledge gained from alliance experiences (Van Wijk et al. 2008).

Drawing on organisational learning theory and the dynamic sustainability capabilities framework, this study investigates the iterative learning processes that occur across the alliance lifecycle and the organisational factors that enable or constrain capability development. The ultimate purpose is to deepen our understanding of how SMEs build dynamic sustainability capabilities through inter-organisational collaboration, contributing both to academic theory and to the design of more effective sustainability partnerships. Notably, we address the following research questions:

RQ1. How do SMEs develop networking and sustainability capabilities throughout the alliance lifecycle?

RQ2. What organisational learning mechanisms support the development of sustainability-related dynamic capabilities?

2 | Theoretical Framework

Sustainability-focused inter-organisational collaborations present inherent learning-related opportunities and challenges. As firms increasingly interact around social and environmental issues, the complexities and tensions of these partnerships become apparent, such as developing new knowledge about sustainability practices while simultaneously learning to effectively manage collaborative relationships (Vurro et al. 2024). This dual learning challenge requires organisations to develop capabilities for both acquiring and integrating sustainability-related knowledge and for managing the learning processes in inter-organisational partnerships. To understand how SMEs develop such capabilities through sustainability alliances, we integrate two complementary theoretical perspectives: (1) organisational learning theory, which explains how knowledge is acquired, distributed, interpreted and retained throughout the alliance lifecycle (Huber 1991; Argote 2011), and (2) the dynamic capabilities framework, which identifies what strategic capabilities firms must develop to address sustainability challenges (Teece et al. 1997; Teece 2007). These perspectives are mutually constitutive: learning mechanisms shape capability development, while existing capabilities influence what and how firms learn from alliances.

2.1 | An Organisational Learning View on the Process of Dynamic Capabilities Development

Alliances serve as key mechanisms for organisational learning (Eisenhardt and Schoonhoven 1996; Kohtamäki et al. 2023)—the process by which organisations acquire, distribute, interpret and retain knowledge at individual, group and organisational levels (Huber 1991; Argote 2011; Argote and Miron-Spektor 2011). This learning process is fundamental to achieving strategic renewal (Crossan et al. 1999) and competitive advantage (Teece 2007; Pérez López et al. 2004). Sustainability alliances represent suitable learning contexts as they often bring together organisations with diverse knowledge bases, institutional logics and operational practices, leading to novel knowledge combinations (Inigo et al. 2020). Moreover, they address challenges requiring continuous learning and adaptation, as new environmental and social issues emerge and both consumers' and stakeholders' expectations shift (Hübel et al. 2022).

Literature distinguishes between two types of learning in alliance contexts: learning from alliances—the capacity to absorb and exploit partner knowledge, potentially leading to internal innovation and enhanced sustainability practices—the accumulation of experience in alliance management itself, encompassing the firm's ability to capture, share, store and deploy knowledge related to partnership management (Hübel et al. 2022; Vurro et al. 2024; Anand and Khanna 2000). These two learning processes are complementary and mutually reinforcing: the learning about process supports the development of networking capabilities (Mitrega et al. 2012), while the learning from one underpins sustainability capabilities development.

Such learning processes evolve across the alliance lifecycle through iterative cycles of experimentation, reflection and adaptation, shaping how knowledge is consolidated over time (Hübel et al. 2022; Inkpen and Tsang 2007; Kale and Singh 2009). Knowledge acquisition happens through direct interaction with alliance partners, exposure to new sustainability practices, and joint problem-solving efforts (Peterman et al. 2020). Knowledge assimilation involves interpreting and integrating this new information within the firm's existing knowledge structures, often requiring the translation of sustainability concepts into the specific organisational context of the SME (Hermelingmeier and von Wirth 2021). In particular, during the pre-formation phase (Focus and Create), SMEs mainly engage in knowledge acquisition about potential collaboration opportunities and sustainability issues. Learning about alliances dominates in these phases as firms assess partner compatibility and sustainability orientation (Das and Kumar 2007). The governance (Manage) phase involves learning about effective partnership management and deepening technical knowledge of sustainability practices. In this phase, knowledge assimilation is in focus as the firm integrates new insight into its operations and decision-making processes. Both learning from and learning about alliances operate simultaneously, as firms coordinate partnerships while absorbing sustainability innovations. In the post-formation phase (Sustain), learning from alliances is emphasised as firms reflect on alliance experiences, codify practices and transfer knowledge to other organisational domains (Inigo et al. 2020; Kale and Singh 2009). While the post-formation phase can be considered as the 'final' stage of the alliance, learning does not necessarily follow such a linear trajectory. Indeed, experience gained from one alliance can shape the formation of future ones, whether with existing or new partners (Zollo and Winter 2002).

The effectiveness of organisational learning in sustainability alliances is influenced by various organisational factors that can either enable or constrain capability development at different stages of the alliance lifecycle. The literature identifies key factors that are particularly relevant for SMEs involved in sustainability partnerships. First, absorptive capacity, that is, the ability to recognise, assimilate and internalise external knowledge (Cohen and Levinthal 1990), determines how effectively SMEs integrate sustainability knowledge from alliances. Many SMEs struggle with this process due to resource constraints, limited prior knowledge and insufficient internal structures for knowledge retention and application.

Second, leadership commitment and strategic orientation (Wang et al. 2024) foster an organisational culture prioritising learning and sustainability, as leaders set objectives, allocate resources and embed sustainability into decision-making. Leadership orientation towards alliances for sustainability signals the importance the company attributes to alliance-driven learning and ensures that sustainability knowledge is integrated into core operations (Bocken and Geradts 2020).

Third, organisational flexibility combined with formalised management structures enables firms to adapt to new knowledge while ensuring effective learning. Flexibility in structures, processes and strategies in response to new knowledge allows adjustment to sustainability challenges, while formalised structures such as dedicated teams, roles and responsibilities, governance mechanisms and training programs provide a foundation for knowledge absorption and integration (Schilke and Goerzen 2010; Kohtamäki et al. 2018; Hockerts and Wüstenhagen 2010).

Finally, relational capital refers to the quality of relationships and trust between alliance partners that influences knowledge dynamics (Dyer and Singh 1998). It facilitates communication across diverse backgrounds and enables the transfer of tacit knowledge, which is essential for sustainability learning but often difficult to codify (Van Wijk et al. 2008). Together, these organisational factors shape the capacity of firms to transform learning processes into tangible capabilities, serving as the bridge between knowledge acquisition and capability development.

2.2 | The Dynamic Capabilities Framework: Addressing the Sustainability Challenge

The dynamic capabilities framework (Teece et al. 1997) provides a lens for understanding how firms develop and deploy capabilities to address sustainability challenges through alliances. At its core are three microfoundations, including the ability to sense or identify opportunities and threats, seize value through resource mobilisation and strategic investment, and reconfigure organisational structures and assets

to maintain competitive advantage (Teece 2007, 2014). In sustainability alliances, sensing capabilities enable firms to identify sustainability challenges, regulatory changes and collaboration opportunities, and emerge particularly from learning about alliances during pre-formation phases. Seizing capabilities allow firms to form strategic alliances and make governance decisions that effectively capture value from sustainability-oriented partnerships. These develop through both learning from and learning about alliances during the formation and governance phases. Reconfiguring capabilities supports the continuous adaptation of organisational structures, processes and resource allocation based on learning from alliance experiences and evolving sustainability requirements. These mature through iterative learning cycles, particularly evident in post-formation stages.

In this view, sensing, seizing and reconfiguring constitute the micro-level processes through which networking and sustainability capabilities develop. Pitelis et al. (2024) defined network capability as the 'ability to develop, maintain, coordinate and exploit relationships, as well as access resources that are controlled by external actors through networks' (p. 3309). Networking capabilities emerge primarily from learning about alliances and encompass what the literature has termed alliance capabilities (Alonso and Andrews 2019; Niesten and Jolink 2020; Al-Tabbaa et al. 2019; Schreiner et al. 2009), comprising three key elements: (1) knowing how to realise collaboration opportunities; (2) building and managing inter-organisational social capital and fine-tuning relational processes; (3) inter-organisational learning (Kohtamäki et al. 2018). While networking capabilities have been linked to economic performance (Chi et al. 2010), sales growth (Parida et al. 2016) and innovation (Mu et al. 2017; Wu 2017; Walter et al. 2006), it remains underexplored in sustainability contexts (Kale and Singh 2009; Wang and Rajagopalan 2015; Vurro et al. 2024), with emerging evidence suggesting they foster eco-innovation capability and sustainability performance (Ben Amara and Chen 2020).

An emerging strand of research studies dynamic capabilities for sustainability (DCsS) (Amui et al. 2017), commonly defined as 'capabilities required to address complex and evolving challenges arising from the internalisation of economic, environmental and social issues as part of corporate strategy' (Buzzao and Rizzi 2021, 7–8), including green product development (Chen and Chang 2013), business models for sustainability (Bocken and Geradts 2020), and sustainable supply chain management (Kähkönen et al. 2018). These capabilities support long-term competitiveness by fostering continuous adaptation (Wang and Ahmed 2007; Winter 2003) while simultaneously creating sustainability effects in terms of processes (e.g., new product development or production process improvements), outcomes (e.g., green innovation), or relational structures (e.g., multi-stakeholder collaboration). Amui et al. (2017) were the first to coin the term 'dynamic capabilities for sustainability' (DCsS) to encompass dynamic capabilities that explicitly focus on and address sustainability issues. These capabilities enable companies to address the increasing demands from external stakeholders and regulators to reduce the negative social and ecological impacts of business activities and increase shared value creation (Buzzao and Rizzi 2021; Cezarino et al. 2019; Wu et al. 2013; Zhang et al. 2020; Abdelfattah et al. 2025; Ortiz-Avram et al. 2024).

Recently, Ortiz-Avram et al. (2024) have proposed four categories of DCsS based on the level of stakeholder integration and sustainability orientation:

1. Firm-level eco-efficiency refers to a company's ability to incrementally adjust and optimise processes and products by systematically assessing stakeholder sustainability concerns.
2. Firm-level transformation involves the capacity to develop new products, redefine business models and innovate internal processes by integrating stakeholder sustainability concerns.
3. Supply chain eco-efficiency indicates the ability to enhance sustainability within the supply chain through collaboration with suppliers to exchange information and best practices, fostering the development of sustainable products and services.
4. Systemic transformation is the capability to integrate stakeholder concerns into decision-making and innovation processes, for example, by establishing structured collaborations with supply chain partners and developing new inter-organisational frameworks, driving collective action and joint innovation initiatives.

Summing up, organisational learning theory and the dynamic capabilities perspective provide a complementary perspective on how SMEs can develop and deploy networking and sustainability capabilities through alliances. While organisational learning theory explicates the mechanisms through which knowledge is acquired, assimilated and applied through the alliances' lifecycle, the dynamic capabilities framework identifies the strategic capabilities firms must develop to address sustainability challenges in dynamic environments. Understanding their integration is key to explaining capability development in sustainability alliances. Indeed, the development of DCsS represents an outcome of this learning-driven capability building process, potentially progressing from internal operational improvements to more complex inter-organisational or systemic innovations. This progression is, however, not linear nor automatic and is highly dependent on organisational factors. Figure 1 illustrates how learning about and learning from alliances interact with the alliance lifecycle phases (Focus, Create, Manage, Sustain) to build networking and sustainability capabilities. Through the microfoundations of sensing, seizing and reconfiguring, these learning processes enable SMEs to develop DCsS, supported by key organisational enablers.

3 | Methodology

3.1 | Research Design

This study adopts a qualitative research design based on a multiple case study methodology (Yin 2009; Eisenhardt 1989). Case selection followed a theoretical sampling approach aimed at

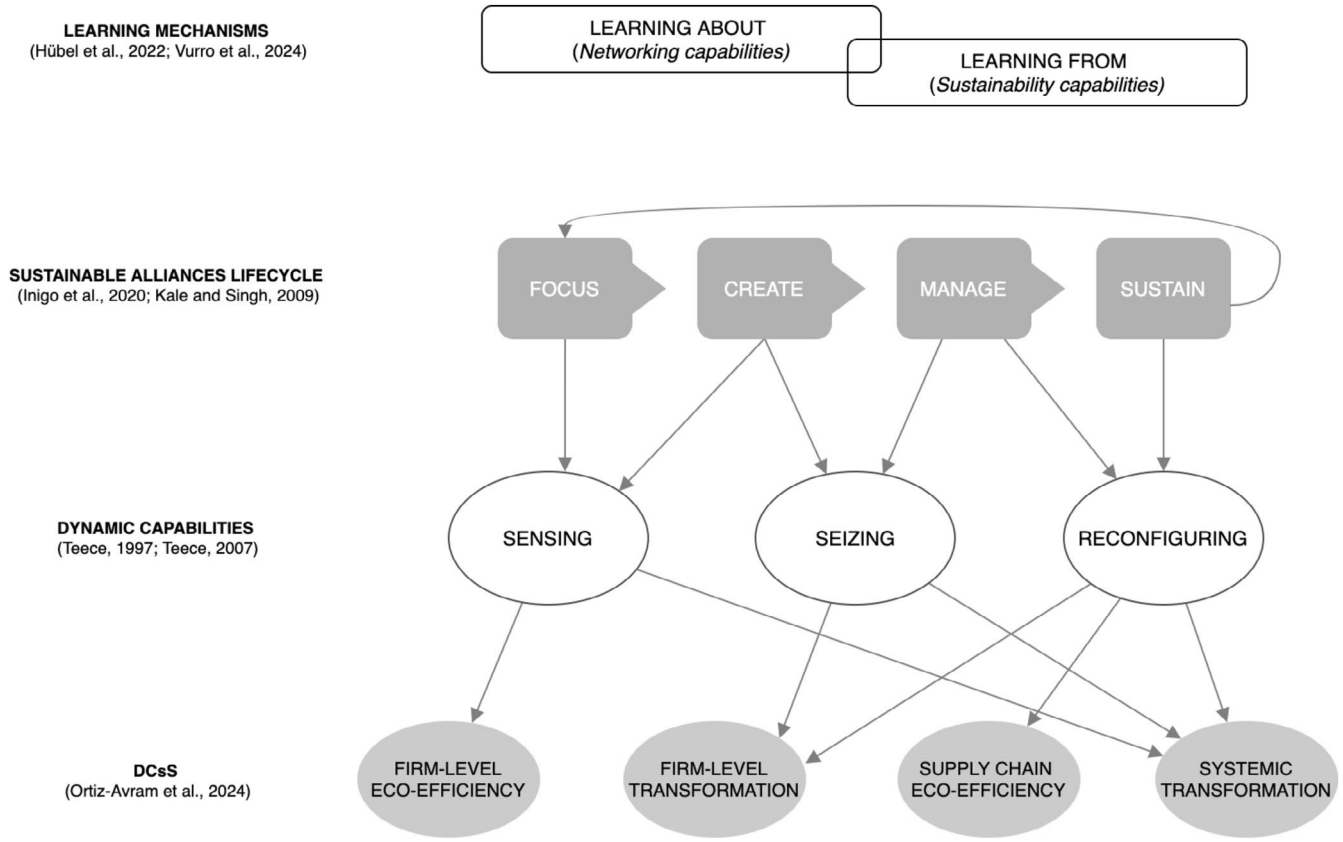

FIGURE 1 | Integrative framework of learning mechanisms, alliance lifecycle, and dynamic capabilities for sustainability. This framework illustrates how SMEs develop dynamic capabilities for sustainability through organisational learning across the alliance lifecycle. Learning about alliances (knowledge about partners and collaboration management) predominates during pre-formation phases (Focus, Create) and supports networking capability development. Learning from alliances (sustainability insights and best practices) becomes more prominent during operational phases (Manage, Sustain) and underpins sustainability capability development. Both processes operate simultaneously during governance. Alliance phases map onto dynamic capability microfoundations: The Focus phase engages sensing capabilities (identifying sustainability challenges and collaboration opportunities); the Create phase initiates seizing capabilities (mobilising resources and establishing partnerships); the Manage phase intensifies seizing while beginning reconfiguring (coordinating partnerships and adapting processes); and the Sustain phase emphasises reconfiguring capabilities (continuously transforming organisational structures based on alliance learning). In turn, dynamic capability microfoundations enable progressive DCsS development. Firm-level eco-efficiency develops primarily through experiential learning and internal process optimisation; firm-level transformation requires more sophisticated seizing capabilities to mobilise resources for sustainable products and business models; supply chain eco-efficiency demands reconfiguring capabilities at the inter-organisational level to restructure supplier relationships and knowledge-sharing mechanisms; and systemic transformation, the highest DCsS maturity level, requires the simultaneous, coordinated deployment of all three microfoundations (sensing, seizing, reconfiguring). *Source:* Author's elaboration.

identifying revelatory cases holding potential for theoretical contribution (Eisenhardt 1989; Eisenhardt and Graebner 2007). Specific criteria have guided the case selection process of this research. First, we focused on companies with legal offices in Italy and classified as SMEs. According to the latest Istat data (2023), SMEs constitute the vast majority of Italian enterprises; specifically, SMEs—which include micro-enterprises (up to 9 employees), small firms (10–49 employees) and medium-sized enterprises (50–249 employees)—amount to approximately 4.9 million, representing almost 99% of the total number of enterprises. SMEs are also the most productive and essential enterprises for the 'Real Italian Economy', capable of generating significant added value. Second, we selected SMEs active in the agri-food sector, which concentrates a large portion of Italian firms and constitutes a key source of added value (Istat 2023). Third, we selected SMEs that were explicitly sustainability-oriented and had formalised such efforts through alliances. Sustainability was considered in its economic, social and environmental dimensions, as well as in its strategic and collaborative manifestations. Finally, we sought variety across alliance typology (R&D vs. commercial) and alliance duration (emergent vs. established).

Based on these criteria and following Eisenhardt (2021), we selected five SMEs: these cases were chosen based on the likelihood of the focal phenomenon occurring and the variation they offered across theoretical dimensions, thus improving generalizability (i.e., transferability) of the emergent theory across settings. The SMEs are listed in Table 1, which provides an overview of their key characteristics.

Data collection and analysis, detailed in the following paragraphs, proceeded iteratively and in parallel until additional data no longer provided new insights into learning processes

TABLE 1 | Overview of the selected case studies.

Case	Industry	Sustainability focus	Type of sustainability alliances
Amaro Lucano	Beverages/ herbal spirits	Sustainability is seen as a long-term strategic value for value creation, involving circular innovation, local supply chains, and cultural heritage promotion	• Commercial B2B for incorporating sustainability into supply chain practices • Non-commercial B2B for value creation (i.e., Associazione Museimpresa) • Pre-competitive alliances with research institutions for promoting sustainable agricultural model • Cultural and territorial with institutions for preserving local traditions (i.e., Essenza Lucano museum)
Aproli	Olive oil cooperative	Economic, social, and environmental sustainability pursued through producer aggregation, value chain certification, and sustainable farming practices	• Supply chain alliances through the producers' organisation • Alliances for sustainable agriculture with other partners of the producers' organisation • Commercial alliances • Knowledge-oriented alliances
Naturbio	Organic farming	Integrates economic, ethical, social, and environmental sustainability; invests in waste reuse, product innovation, and relationship-based learning with partners	• Network alliances aimed at accessing funding • Alliances with large-scale distributors for sustainable innovation processes • Alliances with suppliers for sustainable product innovation • B2B alliances for circular economy
Masseria Redenta	Beekeeping	Promotes long-term social and environmental sustainability through food education, cooperative farming, and response to climate variability	• Consortium alliances with educational purposes • B2B alliances for technological and environmental innovation • Alliances for product quality improvement
Fiordelisi	Agri-food processing	Embeds sustainability in strategic and operational decisions; develops circular packaging and new products, supported by certifications and internal CSR structures	• Customer-driven alliances aimed at acquiring sustainability certifications • Alliances for sustainable product innovation

or capability development (Eisenhardt 1989; Dubois and Gadde 2002). The five cases were purposefully selected to capture variation in alliance types and durations within the agri-food sector, allowing us to identify meaningful similarities and differences in learning and capability development (Eisenhardt and Graebner 2007; Yin 2009).

3.2 | Data Collection

Data were collected through semi-structured interviews (Kvale and Brinkmann 2009) with CEOs and managers. Each SME was interviewed twice (apart from Amaro Lucano, where 3 different senior professional figures were interviewed), yielding a total of 12 interviews conducted remotely via Google Meet, between June 2024 and April 2025. Table 2 summarises the information about the interviews.

Interviews followed two flexible interview protocols informed by organisational learning and DCsS (Legard et al. 2003). The first round (June–August 2024) focused on alliance management competencies across the four phases of the alliance lifecycle, examining current tasks, functions and behaviours performed by Alliance Managers, CEOs, or other managers in each phase (Focus, Create, Manage, Sustain), as well as identifying desired competencies for improved performance in each stage. Additionally, it explored the strategic role of collaboration in the firm's overall strategy, the processes and organisational routines supporting the creation and monitoring of alliances, the profile and core capabilities of those responsible for alliance management, and the cultural factors that facilitate inter-firm collaboration.

The second (March–August 2025) aimed at further exploring and integrating the dynamics of alliance management. It investigated how sustainability is conceptualised and incorporated into strategic and operational decision-making and assessed whether sustainability principles are integrated into both existing and prospective alliances. Specifically, it explores: sustainability conceptualisation and partner selection criteria in the Focus phase; alliance formalisation, conflict management, performance metrics and trust-building mechanisms in the Create phase; coordination systems, performance monitoring, organisational routines and knowledge integration processes in the Manage phase; and long-term engagement strategies, organisational learning, alliance durability factors and formal support structures in the Sustain phase. Finally, it assessed the impact of alliances on sustainability-related product, process and

TABLE 2 | Summary of interviews.

ID	Company	Interviewee	Date and duration	Mode
1	Amaro Lucano	CEO	June 2024–30′	Remotely (Google Meet)
2		Alliance Manager	July 2024–30′	Remotely (Google Meet)
3		Head of Business Development	March 2025–120′	Remotely (Google Meet)
4		Head of Business Development	April 2025–45′	Remotely (Google Meet)
5	Aproli Società Cooperativa	CEO & Alliance Manager	June 2024–30′	Remotely (Google Meet)
6		CEO & Alliance Manager	April 2025–60′	Remotely (Google Meet)
7	Naturbio Soc. Agr. Srl	CEO	July 2024–30′	Remotely (Google Meet)
8		CEO	April 2025–60′	Remotely (Google Meet)
9	Masseria Redenta	CEO	July 2024–30′	Remotely (Google Meet)
10		CEO	April 2025–60′	Remotely (Google Meet)
11	Fiordelisi srl	Managing Director	August 2024–40′	Remotely (Google Meet)
12		Managing director	April 2025–60′	Remotely (Google Meet)

organisational innovations, stakeholder involvement in identifying and implementing eco-efficient solutions, and the broader effects on the firm and its supply chain.

Furthermore, interviews were triangulated with secondary materials, including companies' websites, reports provided during the interviews and publicly available information (e.g., specialised magazines), especially to validate the respondents' narratives.

The combination of primary and secondary sources of data allowed for triangulation across multiple dimensions (Farquhar et al. 2020). First, triangulation across informants was ensured as we interviewed different informants within each organisation (e.g., CEO, Alliance Manager and Head of Business Development) to capture different organisational perspectives on alliance management and sustainability practices. Second, in terms of time, we conducted two rounds of interviews separated by several months (June 2024–April 2025), allowing us to validate initial findings, clarify ambiguities and track evolving practices (Patton 1999). Finally, in terms of data types, we complemented primary interview data with secondary sources to corroborate respondents' narratives.

3.3 | Data Analysis

Interviews were audio-recorded and transcribed verbatim to ensure reliability (Gibbert and Ruigrok 2010). The collected data were manually coded by means of a shared Excel spreadsheet and relied on the iterative identification of main topics emerging from the data. First, each author independently conducted an initial round of open coding, identified recurring themes related to alliance phases, learning mechanisms, organisational enablers and capability development. Second, coding outputs were compared and discussed among the authors. Discrepancies were examined and resolved through iterative discussion, leading to a jointly refined coding scheme and contributing to shared interpretative alignment. Third, codes were reviewed into a structured framework informed by both existing literature and data. The final coding structure comprised four main themes: (1) alliance lifecycle phases (focus phase, create phase, manage phase, sustain phase); (2) type of learning (learning from vs. learning about; formal vs. informal learning mechanisms); (3) organisational enablers (absorptive capability, leadership commitment, organisational flexibility, relational capital); (4) capabilities (first, sustainability-related, that is firm-level eco-efficiency, firm-level transformation, supply chain eco-efficiency, systemic transformation; second networking capabilities, defined as the ability to develop, maintain and exploit relationships, as well as accessing resources controlled by external actors).

This process was abductive and iterative in nature, based on a systematic combining logic (Dubois and Gadde 2002). We alternated between theory and empirical material with the aim to rely on existing literature while exploring new areas. This led to refining categories and updating the coding framework.

Finally, a cross-case comparison was conducted to identify similarities and differences across the five SMEs. The fact that all firms operated within the agri-food sector enabled a controlled comparison while still allowing meaningful variations in alliance practices, learning dynamics and sustainability-related outcomes to surface.

4 | Empirical Findings

The empirical findings are organised following the two RQs guiding this study to provide a complete overview of capability development and of the organisational learning dynamics that underpin it. Section 4.1 addresses how SMEs develop networking and sustainability capabilities across the different phases of the alliance lifecycle, tracing the evolution of capabilities in the selected firms. Section 4.2 focuses on how organisational learning mechanisms enable the development of these capabilities and contribute to enhancing organisational performance.

4.1 | Capability Development Across the Sustainability Alliance Lifecycle

The case studies analysed show that networking and sustainability capabilities emerge through a dynamic process developing along the stages of the alliance life cycle. Each phase is associated with specific behaviours, tools and organisational roles that support the development of capabilities.

In the focus phase, companies clarify the strategic reason behind the implementation of the alliance, often grounded in sustainable innovation objectives, access to new markets, improvement of the supply chain, or response to external pressures. The empirical evidence demonstrates diverse strategic motivations. Fiordelisi exemplifies a market-driven sustainability orientation, identifying opportunities to respond to sustainable packaging demands from large-scale retailers. Aproli, operating as an agricultural cooperative, demonstrates an inherent collaborative orientation focused on circular economy principles through production waste valorisation. Strategic vision emerges as a critical enabler during this phase, with firms demonstrating long-term orientations that extend beyond immediate commercial objectives. As articulated by Amaro Lucano management, the company conceptualises itself as 'a repository of strategic collaborations and alliances that embody the company's values beyond purely commercial objectives' (ID1). Similarly, Masseria Redenta articulates a vision centred on environmental sustainability and educational initiatives.

In the create phase, sustainability alliances are built through a combination of formal mechanisms—such as consortia, contracts, producers' organisations—and informal interactions, including participation in events, peer knowledge exchange and firms' facility visits. This phase is characterised by the development of seizing capabilities that enable firms to mobilise resources and establish collaborative frameworks. Partner identification is typically guided by shared values, geographical proximity and alignment of sustainability objectives. While the processes are often informal, they involve a careful evaluation of partner compatibility. For example, Amaro Lucano actively participates in networks, dedicating time and organisational attention to scouting potential partners. In other cases, alliances emerge in response to collaborative project opportunities or tenders that require aggregation of actors, as observed for Aproli and Masseria Redenta. Similar dynamics emerged in Fiordelisi and Naturbio, where customer requests acted as triggers for alliance formation. Across all cases, pre-existing relationships and trust represent critical enablers of alliance formation, with relational continuity emphasised as a foundation for collaboration. In fact, as reported '[...] they are mostly long-standing partners, as we have built lasting relationships with them, so they know that our collaboration will continue' (ID8). The create phase demonstrates the development of opportunity recognition capabilities, partner evaluation competencies and initial relationship management skills that prove essential for subsequent alliance governance and operational effectiveness.

In the manage phase, the interviewed firms adopt distinct practices related to coordination structures, transparency mechanisms, co-creation and trust-building processes. Firms demonstrate diverse approaches to alliance coordination, ranging from dedicated organisational roles to cross-functional committees. For instance, Amaro Lucano employs an 'accelerator' function for strategic sustainability collaborations, coordinated through a corporate committee structure, while Fiordelisi has established a dedicated Corporate Sustainability Manager role to centralise and coordinate sustainability-aligned decision-making processes. Aproli and Masseria Redenta rely on more 'formalised governance agreements, including operational programmes, executive plans' (ID5), and 'consortium-level guidelines' (ID8) to ensure coordination among members. Information sharing mechanisms vary significantly across firms but emphasise stakeholder communication and performance monitoring. Practices range from structured reporting and formal contractual appendices specifying sustainability requirements to more informal and continuous communication within partnership networks. These mechanisms support alignment among partners and facilitate the monitoring of sustainability-related outcomes.

Joint value creation emerges as a fundamental characteristic of effective alliance management. In more advanced cases, such as Amaro Lucano, co-creation involves sophisticated collaborations covering waste valorisation initiatives, pre-competitive research with universities and collective actions with competitors to promote shared industry values. Moreover, alliances support process and product innovations aimed at improving environmental performance and quality standards, as illustrated by Aproli's initiatives to enhance olive grove management and by Masseria Redenta's technology-enabled projects to reduce environmental impact in apiculture. Across cases, co-creation activities extend beyond bilateral exchanges and involve multiple partners, contributing to the development of relational capabilities and reinforcing trust-based collaboration. In the last phase of the sustainability alliance, companies capitalise on the results achieved. Thus, firms realise tangible benefits from collaborative efforts while establishing mechanisms for performance evaluation and future development. This phase is characterised by the deployment of reconfiguring capabilities that enable continuous improvement and organisational adaptation. According to Naturbio, the sustainability alliance can provide access to new funds and project opportunities. Product and packaging innovation represent another key outcome, as demonstrated by Fiordelisi and Amaro Lucano. Aproli exemplified the development of new approaches to waste reduction as a further tangible outcome of alliances. Finally, intangible benefits, such as improved external legitimisation and strengthening of sustainable identity, emerge from the case of Amaro Lucano. Companies also establish performance evaluation mechanisms. Masseria Redenta implements alliance evaluation processes at the end of the alliance lifecycle, while Fiordelisi communicates the results of the activities by publishing sustainability reporting. In some cases, scaling processes—such as the extension of alliances to new actors in the case of Naturbio—or structural formalisation of promising alliances are observed.

4.2 | Enhancing SME Performance Through Organisational Learning

Results show that organisational learning mechanisms highlight the progressive development of DCsS (Ortiz-Avram et al. 2024)

by enabling SMEs to move from operational eco-efficiency toward systemic transformation. While almost all interviewees show that they have achieved firm-level eco-efficiency, only a subset of firms has progressed toward the higher levels of transformation.

Firm-level eco-efficiency is primarily achieved through investments aimed at optimising internal production processes to reduce environmental impact in terms of energy efficiency (ID12) and water savings (ID8; ID12). Eco-efficiency initiatives are characterised by relatively short implementation times and easily observable outcomes, as noted by Amaro Lucano: 'The effect of energy efficiency is certainly more immediate and usable for the firm to highlight the benefits immediately, in a faster way' (ID4). At this level, learning is mainly driven by direct experience and feedback from internal process improvements. The key enabler is often a strong leadership commitment to cost reduction and operational upgrades, which implicitly or explicitly prioritises eco-efficiency as a means to achieve economic benefits.

Firm-level transformation should be considered as an intermediate stage and implies the development of new sustainable products and/or new business models. These evolutionary and progressive paths require longer time frames and often build upon prior eco-efficiency initiatives. As illustrated by Fiordelisi, firms initially adopt environmentally respectful practices and progressively develop more integrated solutions that generate both environmental and economic value (ID12). Product innovation resulting from the management of alliances can be radical—Amaro zero by Amaro Lucano as a 'new product reference' (ID4)—or incremental, as in the case of Masseria Redenta, where collaboration with external laboratories enhanced product quality (ID10). Firm-level transformation is largely driven by learning from alliances. This involves internalising external expertise and knowledge gained through alliances. Organisational flexibility becomes a crucial enabler, allowing SMEs to adapt their product development and business models based on insights acquired through collaborative relationships.

More complexity is identified in a supply chain transformation that involves no longer just the single firm. Only 3 out of 5 companies demonstrate this level of DCsS maturity. Firms at this stage actively engage suppliers and partners to align environmental standards and practices. This is reflected in the adoption of supplier selection criteria, certification requirements and structured evaluation tools, such as questionnaires, aimed at ensuring consistency with firm-level sustainability parameters (ID8; ID12). For supply chain eco-efficiency, learning extends beyond the individual firm to inter-organisational knowledge exchange. Firms actively engage in knowledge acquisition through direct interaction with suppliers and partners (e.g., questionnaires). This process is significantly enabled by relational capital, fostering trust and open communication required for sharing practices and integrating environmental knowledge across the supply chain.

Systemic transformation represents the most advanced and complex stage of DCsS development and is observed in only one case. At this level, innovation arises from a business practice but involves the actors of the entire product life cycle, from production to end-of-life management. In other words, the involvement of various stakeholders has promoted sustainable changes at the system level. As reported by Fiordelisi, the development of a fully consumable product with recyclable mono-material packaging required close collaboration and coordinated modifications across all supply chain operators, together with a significant reconfiguration of internal production layouts and the entire supply chain (ID12). Systemic transformation is rooted in an iterative and comprehensive organisational learning process that involves not only learning from alliances but also continuous learning about alliances. The enablers here include a highly developed absorptive capacity that allows for the recognition, assimilation and application of complex, system-level knowledge from various external actors. Furthermore, strong leadership commitment to holistic sustainability and highly developed formalised management structures that support structured alliances, and new inter-organisational frameworks are essential for driving collective action and joint innovation initiatives that lead to system-wide change.

Thus, organisational learning mechanisms grow in complexity alongside DCsS maturity, shifting from internal feedback-driven learning to collaborative, codified and systemic knowledge integration, in the end enabling SMEs to reconfigure themselves in order to gain a sustainability-oriented competitive advantage and increase their competitiveness.

4.3 | Integrative Cross-Case Comparison of DC and Sustainability Capability Trajectories

To increase the clarity of cross-case insights, Tables 3 and 4 synthesise the DC and organisational differences observed across the five SMEs. Specifically, Table 3 provides a structured cross-case mapping of the DCs (sensing, seizing and reconfiguring) across the four alliance phases (Focus, Create, Manage and Sustain). Table 4 summarises key organisational and relational characteristics—such as alliance formalisation, learning orientation, co-creation intensity and capability evolution patterns—that help explain the heterogeneity in developmental trajectories. Together, they offer a more synthetic representation of cross-case patterns and contrasts, supporting a clearer interpretation of how DCsS emerge and evolve across different alliance contexts.

Across the five cases, an evolutionary pattern emerges linking alliance learning modes, dynamic capabilities and the DCsS levels achieved. While all firms begin by developing sensing capabilities, the trajectory from sensing to seizing and then to reconfiguring is strongly conditioned by whether firms predominantly engage in learning-from or learning-about alliances. Firms where learning-from dominates—such as Fiordelisi, Naturbio and partially Amaro Lucano—benefit from external technical inputs, customer requirements and partner-driven knowledge that accelerate decision-making and facilitate earlier and more substantial reconfiguring. These firms typically reach higher DCsS levels, as evidenced by Fiordelisi's progression toward systemic transformation and Naturbio's and Amaro Lucano's achievement of supply-chain eco-efficiency. Conversely, firms characterised by a stronger emphasis on learning about alliances—most clearly Aproli—follow a nonlinear and delayed pathway: a lot of time is required to build

TABLE 3 | Cross-case mapping of DC (sensing, seizing, reconfiguring) across alliance phases.

DC/alliance phase	Amaro Lucano	Aproli	Naturbio	Masseria Redenta	Fiordelisi
Sensing (Focus/create)	Emerging-need identification (tourism, sustainability, cultural heritage); partners & technological opportunities scouting	Supply-chain analysis, standards gaps detection, trust issues	Sustainability opportunity mapping, partner compatibility assessment, territorial relationship awareness	Experiential opportunity recognition, sustainability exploration, project alignment, partner evaluation	Certification-based partner selection, customer-driven sustainability assessment, market-trend awareness
Seizing (Manage)	Consortium governance, shared-guideline definition, operational coordination	Project coordination, buyer-relationship handling, cooperative governance management	Collaboration formalisation, sustainability-governance integration	Consortium creation, shared-activity organisation, collective operational structuring	Project formalisation, strategic investment planning, supplier management
Reconfiguring (Sustain)	Continuous model adaptation, experiential refinement, incremental evolution, process adjustment	Organisational consolidation, structural reorganisation, capability transfer, long-term refinement	Gradual internal adaptation, operational consolidation, progressive capability strengthening	Stepwise evolution, process modification, incremental operational change	Production-layout reconfiguration, new-line development, supplier diversification

TABLE 4 | Cross-case comparison of maximum DCsS levels and key organisational/relational differences shaping capability development.

	Amaro Lucano	Aproli	Naturbio	Masseria Redenta	Fiordelisi
Formalisation of alliances	Medium	High	High	Low	Medium
Dedicated alliance/ sustainability managerial role?	No	No	No	No	Yes
Co-creation with partners	High	Low	High	High	High
Capability evolution pattern	Incremental	Non-linear	Non-linear	Incremental	Accelerated
Dominant learning mode	Mixed (learning-from & learning-about)	Learning-about	Learning-from	Learning-from	Learning-from
Maximum DCsS level reached	Supply chain eco-efficiency	Firm-level transformation	Supply chain eco-efficiency	Firm-level transformation	Systemic transformation

trust, reduce uncertainty and understand partner expectations before advanced seizing and reconfiguring capabilities can emerge, resulting in firm-level transformation but only after long maturation. Finally, cases such as Amaro Lucano and Masseria Redenta, which combine both learning modes and rely on incremental collaboration, evolve gradually, achieving intermediate DCsS levels consistent with their stepwise reconfiguring processes. Overall, the balance between learning-from and learning-about alliances appears to be a structural mechanism shaping not only the speed and pattern of capability evolution but also the maximum level of sustainability-oriented transformation (DCsS) that SMEs can achieve.

5 | Discussion

The study combines two different streams of research: organisational learning and firms' dynamic capabilities (Teece et al. 1997; Argote 2011) to explore networking and sustainability-related capabilities development in sustainability alliances. The results reveal that sustainability and networking skills in agri-food SMEs develop through a dynamic and ongoing process that unfolds throughout the life cycle of alliances. Organisational learning drives the development of DCsS, enabling SMEs to progress from operational eco-efficiency to systemic transformation and thereby enhancing their competitiveness.

A main insight deriving from this integration is that the two theoretical perspectives are not only complementary but rather mutually constitutive in sustainability contexts. Indeed, learning mechanisms—representing the 'how'—directly shape which capabilities are developed—that is, the 'what' – and, in turn, existing capabilities influence what firms can learn from alliances (Zollo and Winter 2002; Kale and Singh 2009). By combining the lenses of organisational learning and dynamic capabilities, our framework explains not only what capabilities SMEs develop in sustainability alliances, but also how learning mechanisms drive this development, clarifying the microfoundations of DCsS in SME contexts. This integration contributes to theory by linking learning mechanisms, alliance structures and capability evolution (Hübel et al. 2022; Vurro et al. 2024).

Three main insights emerge from this integration, contributing to both organisational learning and dynamic capabilities literatures. First, sustainability alliances not only allow firms to access resources and knowledge that would otherwise be difficult to acquire or develop independently (O'Dwyer et al. 2011), but they also serve as 'privileged' organisational learning spaces. Learning from alliances manifests as experiential learning through which firms acquire technical sustainability-related knowledge and standards and supply chain practices. This is exemplified by Fiordelisi's development of fully recyclable packaging solutions through sustainability alliances. Learning about alliances represents reflective learning based on alliance management experience, including the ability to capture, share and use knowledge related to partnership governance, organisational roles and routines. For instance, Fiordelisi created a new organisational role through an alliance, that is, the 'Corporate Sustainability Manager', illustrating how firms institutionalise alliance management knowledge through dedicated organisational structures. This centralised role represents a significant shift from reacting to external stimuli to internal proactivity in the management of sustainable alliances. The two learning processes are mutually reinforcing; learning about alliances creates the relational infrastructure and governance mechanisms that enable more effective learning from alliances (Kale et al. 2000). Learning from alliances (e.g., achieving sustainability outcomes) strengthens partner relationships and trust, facilitating deeper learning about alliance management (Inkpen 2000). This reciprocal dynamic explains why firms with strong networking capabilities are better positioned to develop advanced sustainability capabilities, and vice versa (Ben Amara and Chen 2020; Parida et al. 2016).

A second insight reveals a sequential developmental pattern of DCsS. The research maps learning processes, showing how

sensing, seizing and reconfiguring capabilities emerge sequentially and iteratively through distinct learning mechanisms (Inkpen and Tsang 2007) across alliance phases, enabling an evolutionary progression in SMEs' sustainability practices from firm-level eco-efficiency through firm-level transformation and supply chain eco-efficiency, culminating in systemic transformation. Each DCsS level requires distinct configurations of learning from and learning about alliances, with the evolution from firm-level eco-efficiency to systemic transformation reflecting a progressive, learning-driven development of dynamic capabilities. At the firm-level eco-efficiency stage, SMEs primarily engage sensing capabilities to identify internal optimisation opportunities (energy efficiency, water conservation and waste reduction), aligning with the idea of ordinary (or 'zero-level') capabilities that enable efficient performance of routine activities (Winter 2003). Firm-level eco-efficiency develops primarily through learning from internal process improvements, with minimal alliance learning, embodying what Zollo and Winter (2002: 341) term 'experience accumulation'. For example, energy audits and optimisation form the basis for measurable cost reductions and environmental benefits, illustrating a form of experiential learning and feedback (single loop learning). The transition to firm-level transformation requires more sophisticated seizing capabilities, as firms must mobilise resources to develop new sustainable products and business models. Learning becomes more relational and requires balanced learning from technical partners and learning about partnership coordination, corresponding to the concept of 'knowledge articulation' (Heimeriks et al. 2009). Capability development displays an iterative nature (Zollo and Winter 2002), where experience from initial eco-efficiency initiatives provides the foundation for more complex transformational activities. Here, absorptive capacity becomes crucial as SMEs begin internalising expert knowledge from allies, allowing them to innovate products and business models. This stage is characterised as double-loop learning, and firms should become more flexible in structures and routines to react to new insights. Supply chain eco-efficiency represents the deployment of reconfiguring capabilities at the inter-organisational level, requiring firms to restructure their supplier relationships and knowledge-sharing mechanisms. Structured knowledge exchange mechanisms (e.g., shared audits, joint product development) are required, supported by relational capital and trust. Finally, systemic transformation—achieved by only one case firm—represents the highest level of DCsS maturity and requires the simultaneous deployment of all three dynamic capabilities microfoundations across multiple stakeholder networks. Systemic transformation relies on meta-learning ('learning to learn') about alliances, involving the systematisation and codification of allies' practices and the integration of system-level knowledge from different stakeholders. Achieving this stage requires high absorptive capacity, formalised governance structures and new professional roles and transformational leadership.

This finding, consistent with previous studies (Bai et al. 2024), enriches the literature by demonstrating how dynamic capabilities can drive system-level change beyond individual firm boundaries, where each level functions as a structural basis for the next one. Such an evolution is not automatic but requires the activation of internal and external enablers, such as new competences, collaborative networks and external pressures (Da Giau et al. 2020). This granular mapping of learning requirements to capability levels contributes to the DCsS literature by illustrating the learning-driven progression from firm-level eco-efficiency to systemic transformation. Extant literature has described capability types (Amui et al. 2017; Ortiz-Avram et al. 2024), but it has not explored the specific learning processes enabling their development (Helfat and Peteraf 2015).

A third insight relates to SMEs' learning approaches that significantly differ from those of large companies as documented in the literature (Russo and Perrini 2010). Our data emphasises the emergence of contextual and distributed approaches, based on intangible assets and adaptive leadership roles. Unlike larger organisations with dedicated functional units and formal tools for managing alliances, relational capital, trust, the establishment of hybrid teams and long-term strategic leadership emerge as enablers of organisational learning through sustainability alliances.

Relational capital and trust emerge as key aspects in all the cases under investigation. The emphasis on trust-building, exemplified by Masseria Redenta's 'patience and silence' approach, Amaro Lucano's value-based partnerships transcending immediate economic consideration, and Fiordelisi's focus on transparency and communication as trust-building mechanisms shows how SMEs leverage relational capital to overcome formal structural deficiencies.

Our study also points to the emergence of hybrid roles, representing an adaptive response to SMEs' limited formalisation of roles. This is the case of sustainability managers who simultaneously coordinate alliances and drive strategic initiatives and of distributed leadership approaches. Senior figures often take on multiple functions, acting as 'accelerators' of change and sustainability, as in the case of Amaro Lucano. At Masseria Redenta, the CEO also serves the role of alliance manager, with the role of organisational culture and attachment to the territory playing a key role in shaping long-term orientation. Through an alliance developed with a local university, Aproli established a new professional figure, the 'Corporate Sustainability Manager', who acts as a collector, coordinator and driver of cross-functional sustainability activities. Thus, leadership orientation emerges as a critical factor in sustainability capability development (Bocken and Geradts 2020). These SMEs-specific learning approaches represent important boundary conditions for our dual learning framework. While the distinction between learning from and learning about alliances appears universal across organisational contexts, our study contributes by demonstrating that the ways in which SMEs operationalise these learning processes differ fundamentally from large firms. Whereas large firms may formalise learning through dedicated units, SMEs rely on relational capital, hybrid roles and adaptive leadership to operationalise learning from and about alliances.

While our theoretical framework integrates established perspectives on organisational learning (Argote 2011; Huber 1991) and dynamic capabilities (Teece et al. 1997), which have broad applicability, our empirical insights into how SMEs operationalise these learning processes and develop sustainability

capabilities are bounded by specific contextual conditions (Busse et al. 2017). From a sectoral perspective, the framework was applied to the agri-food sector, which is characterised by strong environmental dependencies, fragmented structures and a prevalence of cooperative and trust-based governance. These features may intensify sustainability-oriented collaboration and informal learning mechanisms in comparison to service industries or hierarchical manufacturing supply chains. While the distinction between learning from and learning about alliances is likely transferable across sectors, the relative importance of organisational enablers, especially relational capital and formal governance structures, may vary. This is further emphasised by the geographical and institutional context (i.e., the Italian one), which is traditionally marked by strong territorial embeddedness, cooperative traditions and dense social capital, reinforcing the effectiveness of informal, trust-based learning mechanisms. From an organisational point of view, findings reflect the dynamics of SMEs, characterised by resource constraints, hybrid roles and distributed leadership which shape learning processes and capability development. Larger counterparts may rely on dedicated alliance management units or formal knowledge systems, potentially progressing more rapidly through DCsS stages and facing different challenges related to coordination complexity. We posit that the core mechanisms of learning from versus learning about alliances, the microfoundations of dynamic capabilities and the progression of DCsS are applicable beyond the studied context. However, the speed and sequencing of DCsS transition and the weight of enablers might be contingent on sectoral, organisational, geographical and institutional conditions (Busse et al. 2017).

6 | Conclusions

This study investigates how SMEs in the agri-food sector develop networking and sustainability capabilities through strategic alliances by integrating organisational learning theory and the dynamic capabilities framework. The results reveal that sustainability and networking skills evolve through a dynamic, ongoing process that unfolds across the alliance life cycle, enabling SMEs to build DCsS through strategically chosen collaborative relationships.

This study provides three theoretical contributions. First, by integrating organisational learning theory with the dynamic capabilities' framework, we advance understanding of capability development mechanisms in sustainability contexts. Building on recent work examining sustainability alliances (Vurro et al. 2024; Hübel et al. 2022; Inigo et al. 2020), we demonstrate how learning from and learning about alliances operate as mutually constitutive processes and what capabilities emerge through which mechanisms. Second, we contribute to the DCsS literature (Amui et al. 2017; Ortiz-Avram et al. 2024) by linking specific learning configurations to each capability level (i.e., from experiential, single-loop learning at firm-level eco-efficiency, to meta-learning at systemic transformation). Third, the study highlights the unique, contextually embedded learning approaches of SMEs, emphasising the role of relational capital, trust, hybrid roles and adaptive leadership as informal platforms compensating for limited formalisation—constituting a distinct advantage in resource-constrained contexts.

From a managerial point of view, the research offers practical insights for managers of SMEs seeking to implement alliances as a means for sustainable transformation. A first insight is that firms should develop internal roles and organisational routines to support learning through alliances. For example, institutionalising alliance-related knowledge through a dedicated Sustainable Alliance Manager (SAM) role, distinct from the traditional Sustainability Manager role, as it focuses specifically on partnerships and learning from alliances. Yet, its role goes beyond simply managing partnerships or implementing sustainability, as it acts as the infrastructure through which inter-organisational learning processes transform into DCsS, enabling progression from firm-level eco-efficiency to systemic transformation This professional should be responsible for managing, coordinating and optimising sustainability-oriented strategic alliances, acting as the organisational bridge between learning from alliances (technical sustainability knowledge) and learning about alliances (partnership management capabilities). The SAM requires cross-functional expertise in sustainability, alliance management and interpersonal skills, with responsibilities including building and maintaining trusting relationships with partners; facilitating the sharing of knowledge and best practices; negotiating agreements that promote common sustainability goals; and creating procedures for documenting and disseminating alliance-derived knowledge throughout the organisation. The SAM role's effectiveness depends on three supporting conditions: (i) leadership commitment to supporting alliance initiatives through resource allocation and specifying training programs; (ii) relational capital, i.e., the ability to build and maintain trusting relationships with partners to facilitate knowledge exchange; (iii) monitoring alliance performance through clear evaluation systems to promote continuous improvement across DCsS levels. These elements enable SMEs to maximise capability-building potential and achieve systematic sustainability transformation.

A second insight from our analysis is that SMEs should consider alliances not only as instruments to access resources, but as valuable spaces for technical and managerial learning. The dual learning approach of the study shows that learning from alliances could lead to the acquisition of sustainability-related technical knowledge, and that learning about alliances could develop partnership management capabilities. This approach can, in turn, lead to significant innovations in sustainability practices and drive the progression from firm-level eco-efficiency through supply chain eco-efficiency and systemic transformation.

While the study offers valuable insights into how agri-food SMEs develop DCsS through alliances, it presents limitations. First, the research relies on a qualitative, multiple case study design limited to five Italian SMEs. While this approach provides contextual richness, it limits the generalizability of findings. Second, we focus on successful alliances; no instances of failed or inactive alliances were included. Future studies could first longitudinally explore the evolution of dynamic capabilities over time to deepen our understanding of the trajectory from eco-efficiency to systemic transformation; second, studies could compare cases across sectors and geographies to validate our dual learning framework and alliance-enabled capability development; third, studies could encompass failed or inactive

alliances to explore factors inhibiting learning and capability development.

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