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Silvia Lucciarini ^{1,*} , Annamaria La Chimia ²  and Massimiliano Crisci ³ 

¹ Department of Social Sciences and Economics, Sapienza University of Rome, 00185 Rome, Italy

² School of Law, University of Nottingham, Nottingham NG7 2RD, UK; annamaria.lachimia@nottingham.ac.uk

³ National Council of Research, Research Institute for Population and Social Policies, 00185 Rome, Italy; m.crisci@irpps.cnr.it

* Correspondence: silvia.lucciarini@uniroma1.it

Abstract

This paper investigates how sustainable public procurement (SPP) is operationalised in school catering in the Metropolitan City of Rome and how it reshapes market conditions affecting the participation of small and medium-sized enterprises (SMEs) in the region. While SPP is widely framed as a lever for sustainability and local development, its concrete effects on SME inclusion and supply-chain organisation remain underexplored. Drawing on procurement document analysis and supply-chain reconstruction in the Metropolitan City of Rome, the study examines how sustainability criteria—such as organic quotas, traceability requirements and quality standards—are translated into operational requirements. The findings show that SPP goes beyond the simple performative addition of sustainability requirements to existing markets and actively reorganises market coordination structures and supply-chain relations. Procurement shapes not only what is sourced, but also how logistics, continuity of supply, and coordination are organised across the agri-food chain. SME participation emerges as conditional and capability-dependent rather than automatically enabled by sustainability-oriented procurement. In fragmented agri-food systems, smaller firms often participate indirectly through intermediaries or larger catering operators rather than through direct access to contracts. Rather than interpreting these dynamics as a simple exclusion of SMEs, the paper argues that SPP operates as a form of selective and asymmetrical market-shaping, redistributing participation opportunities unevenly across actors depending on their organisational and coordination capacities. The paper contributes to the literature by conceptualising procurement as a governance instrument whose effects depend on the interaction between procurement architecture, sustainability requirements, and the structural characteristics of the supply base. More broadly, it highlights the importance of aligning sustainability objectives with existing supply-chain capacities and territorial market structures when designing procurement policies.

Keywords: sustainable public procurement (SPP); agri-food supply chains; market shaping; SME participation



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1. Introduction

Public procurement has progressively evolved from a predominantly administrative function into a strategic policy instrument through which contemporary states intervene in markets and steer socio-economic transformations. Traditionally grounded in principles

of competition, transparency and efficiency, procurement systems are now increasingly mobilised to pursue broader objectives such as environmental sustainability, innovation and social inclusion [1,2]. Within the European Union, where public procurement accounts for approximately 14% of GDP, this transformation has been particularly evident, as procurement has been reframed as a demand-side governance tool capable of influencing production systems and market dynamics. In its 2017 Communication *Making Public Procurement work in and for Europe*, the European Commission explicitly emphasised the strategic role of procurement in advancing sustainability and innovation objectives.

This shift initially emerged in Europe through the development of Green Public Procurement (GPP), generally defined as the process through which public authorities procure goods, services and works with reduced environmental impacts throughout their life cycle [3–5]. Since the early 2000s, and especially following the Commission's Communication *Public procurement for a better environment* (COM(2008)400), GPP has been promoted as a key instrument for advancing environmental objectives by leveraging public purchasing power. Important judgments of the Court of Justice of the European Union (CJEU) also contributed to progressively legitimising the inclusion of environmental and social objectives within procurement procedures—from the *Bentjes* case (Case C-225/98) to the more recent *Tim* judgment (C-395/18) [6].

Over time, however, procurement governance has progressively moved beyond a narrow environmental focus toward a broader conception of sustainability. More recent policy frameworks—including the Circular Economy Action Plan, the European Green Deal and the Farm to Fork Strategy—have reinforced the idea that procurement should simultaneously pursue environmental, social and economic objectives. In this sense, the broader notion of sustainable public procurement (SPP) has progressively emerged within both policy and academic debates. While GPP primarily focuses on reducing environmental impacts, SPP encompasses a wider set of sustainability dimensions, including social inclusion, economic resilience, ethical sourcing and territorial development. This broader conceptualisation is particularly relevant in the agri-food sector and school catering systems, where procurement policies simultaneously affect environmental sustainability, local economies, labour conditions, welfare provision and access to food [7,8]. For this reason, although environmental criteria remain central in our analysis, we adopt the term SPP throughout the paper, as it more accurately captures the multidimensional and governance-oriented nature of contemporary procurement systems.

At the same time, the growing policy emphasis on sustainable public procurement often rests on an implicit assumption: namely, that the incorporation of sustainability criteria into procurement procedures will automatically generate socially and environmentally desirable outcomes. A growing body of literature challenges this interpretation. Empirical studies on GPP and SPP show that implementation processes are mediated by institutional pressures, organisational constraints and administrative routines, often producing outcomes that only partially correspond to stated policy goals [9,10]. In particular, recent work suggests that public administrations may adopt sustainable procurement practices not only to transform markets, but also to comply with policy expectations and legitimacy pressures within sustainability-oriented governance environments [11,12].

These dynamics suggest that procurement should not be interpreted as a neutral or purely technical mechanism, but rather as a governance instrument that actively structures markets and conditions participation within them. By defining tender specifications, evaluation criteria and contractual obligations, procurement shapes the organisation of supply chains, redistributes opportunities across firms and privileges specific organisational and coordination models. In this sense, procurement can be understood as a form of

state-led market-shaping, in which public demand contributes to reconfiguring exchange conditions, actor roles and value-chain organisation [13–16].

However, procurement's capacity to shape markets is neither neutral nor unlimited. Its effects depend on the interaction between procurement design and the structural characteristics of the sectors in which it operates. Procurement rules are formally binding only for actors seeking access to public contracts, but their influence may extend well beyond direct suppliers, especially in sectors where public demand represents a stable or dominant outlet. At the same time, procurement-driven transformations are constrained by existing supply-chain structures, production capacities and coordination arrangements. As a result, market-shaping processes may generate uneven and selective outcomes, privileging actors with greater organisational, logistical and administrative capacities while shifting adjustment pressures onto weaker or more fragmented actors.

These dynamics are particularly relevant in the agri-food sector, where production systems are deeply embedded in territorial economies and characterised by a high prevalence of small and medium-sized enterprises (SMEs). In the European Union, SMEs represent the vast majority of agri-food businesses, and their role is especially pronounced in countries such as Italy, where agricultural production is highly fragmented and rooted in localised production systems. Territorial analyses of food systems have shown how local agri-food economies are organised around dense networks of small producers, processors and distributors, contributing not only to economic activity but also to landscape management, cultural identity and social cohesion [17].

Within this context, the relationship between public procurement and SMEs becomes particularly significant. On the one hand, SPP is frequently presented as a tool capable of supporting local economies by creating stable demand for sustainable products and favouring shorter supply chains [18–20]. On the other hand, participation in procurement markets requires firms to comply with increasingly complex administrative, logistical and certification requirements, as well as the ability to ensure continuity and scale of supply [21,22]. These conditions may disproportionately disadvantage smaller producers operating in fragmented production systems.

This tension becomes especially visible in public food procurement and school catering systems [23]. Evidence from the Lazio region, i.e., the region where the chosen case study—Rome—operates, shows that school food procurement is organised through complex supply chains involving producers, wholesalers and catering companies, with the latter often acting as central coordinators for sourcing, logistics and service delivery. In these configurations, SMEs rarely access procurement markets directly; rather, they tend to participate indirectly through intermediaries or subcontracting arrangements. The issue, therefore, is not simply whether SMEs participate, but under what organisational conditions and through which coordination structures participation becomes possible.

The Italian case provides a particularly relevant context for examining these dynamics. Italy has developed one of the most advanced regulatory frameworks for sustainable procurement in Europe, notably through the introduction of the Minimum Environmental Criteria (Criteri Ambientali Minimi—CAM; first introduced by Art 1, Paragraph 1126ss, of Law n.296, 27 December 2006 (Budget Law 2007)), made mandatory under Article 34 of the Public Procurement Code (Legislative Decree 50/2016) and now, after the adoption of the new Procurement Code, covered by Art 57 of Legislative Decree 36/2023). The CAM translate sustainability objectives into concrete procurement requirements, including minimum quotas for organic products, traceability systems and environmental standards. In school catering, for instance, they require significant shares of food categories to be sourced from organic production. While these criteria aim to promote sustainable consumption and pro-

duction patterns, they also reshape access conditions to procurement markets, potentially generating differentiated effects across suppliers with different organisational capacities.

Within this framework, the school catering system of the Lazio region—and particularly the case of Roma Capitale—represents a critical empirical case. The scale of procurement, combined with the diversity of regional agricultural production and the prevalence of SMEs, makes it possible to analyse how sustainability-oriented procurement interacts with territorially embedded and structurally fragmented supply chains.

Against this background, the paper addresses two interrelated research questions: how sustainability requirements embedded in public procurement are translated into operational and organisational conditions within agri-food supply chains; and how these conditions affect the participation and positioning of SMEs within procurement-driven markets.

The paper argues that sustainable public procurement should be understood as a selective and asymmetrical market-shaping instrument. Rather than automatically supporting local SMEs through the inclusion of sustainability criteria, procurement reorganises supply-chain coordination structures and redistributes participation opportunities unevenly across actors. In this perspective, the effects of SPP depend less on the formal inclusion of environmental criteria than on the alignment between procurement architecture, sustainability requirements and the structural characteristics of the supply base.

2. Public Procurement as a Market-Shaping Policy Instrument

The conceptualisation of public procurement has increasingly shifted from a neutral administrative activity to a central component of contemporary economic governance. Rather than merely allocating public resources efficiently, procurement operates as a policy instrument capable of structuring markets, defining standards and influencing companies' behaviours [2,24,25]. In this perspective, procurement belongs to the broader family of “instruments of public action”, whose effects extend beyond implementation to the organisation of economic and social relations.

This interpretation resonates with the literature on the market-shaping role of the state, which emphasises how public authorities actively construct and organise markets rather than simply correcting market failures [14]. Through procurement, the state not only generates demand but also defines its qualitative characteristics, embedding environmental, social and technical standards into contractual arrangements. In doing so, procurement shapes the conditions under which firms access public markets and influences how supply chains are organised and coordinated.

At the same time, procurement-driven market shaping does not occur in a vacuum. Its effects are mediated by legal frameworks, administrative routines, organisational constraints and the structural characteristics of the sectors in which procurement operates. Procurement therefore functions as a hybrid governance instrument, simultaneously oriented toward regulatory compliance, economic efficiency and strategic policy objectives. As Vidotto Fonda and Rossi argue, procurement governance is characterised by the coexistence of multiple and potentially competing institutional logics, which influence how transactions are organised and coordinated across public and private actors [26]. These tensions become particularly visible in the context of sustainable public procurement.

A first logic is administrative and legal, grounded in procedural compliance, transparency requirements and accountability mechanisms. This logic prioritises formal correctness, standardisation and risk minimisation, often encouraging highly proceduralised and legally cautious procurement practices [27]. A second logic is economic, centred on efficiency, competition and cost minimisation. Rooted in market-oriented approaches to public administration, this logic assumes that competitive tendering processes produce value for money and efficient allocation of resources. A third logic is strategic and

policy-oriented, underpinning the growing use of procurement to pursue sustainability, innovation and social objectives. This logic seeks to mobilise procurement as a governance mechanism capable of steering markets and influencing production systems beyond purely economic objectives.

The coexistence of these logics generates structural tensions within procurement systems. Sustainability-oriented procurement requires public administrations to move beyond price-based evaluation and incorporate qualitative dimensions—such as traceability, environmental sustainability or territorial embeddedness—that are more difficult to standardise and monitor. As several studies have shown, these tensions may lead to forms of partial or uneven implementation, where sustainability criteria are formally incorporated into procurement frameworks but translated into operational practices through existing administrative and market structures [9,11].

In this sense, procurement should not be understood simply as a mechanism for introducing sustainability criteria into markets. Rather, it actively contributes to reorganising market relations and supply-chain coordination structures. Public procurement defines not only what is purchased, but also the organisational and logistical conditions through which production and distribution become compatible with public demand. In sectors characterised by complex supply chains, procurement may therefore favour specific coordination models and organisational arrangements over others.

These dynamics are particularly significant in agri-food systems. Public food procurement, especially in school catering, requires continuity of supply, standardisation, logistical integration, certification compliance and the capacity to deliver large volumes within strict contractual conditions. In fragmented production systems such as the Italian agri-food sector, these requirements may exceed the organisational capacities of many small producers when considered individually. As a result, participation often depends on the presence of intermediaries, wholesalers or larger catering operators capable of aggregating supply, coordinating logistics and ensuring contractual compliance.

From this perspective, the issue is not simply whether SMEs participate in procurement markets, but how participation is structured and through which organisational forms it becomes possible. Existing literature frequently frames sustainable procurement as an opportunity for local SMEs and shorter supply chains [18]. However, this assumption risks overlooking the organisational and coordination requirements embedded within procurement architectures themselves. As Dorigatti and Mori observe in a different but related domain, procurement simultaneously operates through logics of market expansion and market regulation, generating tensions between sustainability objectives and competitive coordination mechanisms [28]. These tensions are arguably also affected by the way procurement is structured—through the aggregation of demand, division into lots, etc.—which influences companies' capacity and willingness to participate in public tender opportunities.

This paper conceptualises these tensions as constitutive features of procurement-driven governance. Sustainability criteria may indeed promote environmental upgrading and territorial embeddedness, but they may also reinforce asymmetries between actors with different organisational and coordination capacities. In this sense, procurement standards can operate simultaneously as enabling and selective mechanisms: they create opportunities for firms capable of adapting to procurement requirements while increasing adjustment pressures for less structured actors.

This perspective also requires moving beyond binary interpretations of procurement as either inclusive or exclusionary. The empirical issue is not whether procurement “supports” or “fails” SMEs in absolute terms, but how procurement reorganises participation opportunities across supply chains. In fragmented agri-food systems, SMEs frequently

remain present within procurement-driven markets, although often through indirect or subordinated forms of participation mediated by larger coordinating actors. Procurement, therefore, contributes to reshaping governance relations within the supply chain rather than simply determining market access in formal terms.

Building on these considerations, this paper argues that sustainable public procurement should be understood as a selective and asymmetrical market-shaping instrument. Its effects emerge from the interaction between sustainability requirements, procurement architecture and the structural characteristics of the supply base. Analysing these interactions is therefore essential for understanding the distributive and territorial consequences of sustainability-oriented procurement policies.

This theoretical perspective provides the basis for the empirical analysis that follows, which examines how these dynamics unfold within the school catering procurement system in Rome and the Lazio region. Rather than assuming that procurement automatically generates sustainable and locally embedded outcomes, the analysis focuses on how sustainability objectives are operationalised through concrete organisational and coordination arrangements within procurement-driven agri-food markets.

3. Data and Methods

This study adopts a qualitative case-study [29] design combining procurement document analysis, legal-institutional analysis and supply-chain reconstruction in order to investigate how sustainable public procurement (SPP) is operationalised within large-scale school catering systems and how it reshapes participation conditions across agri-food supply chains.

The empirical analysis focuses on the school catering tender issued by Roma Capitale in 2021 for the period September 2021–July 2026. The contract represents one of the largest public catering procurement procedures in Europe, with an estimated value of approximately €360 million and service provision involving around 150,000 meals per day distributed across the metropolitan school system. The procurement structure is organised through multiple territorial lots and involves highly articulated operational requirements concerning sourcing, logistics, traceability, quality control and continuity of supply.

The Rome case was selected because it represents a particularly relevant and information-rich case for analysing procurement-driven market transformations. First, the tender extensively operationalises sustainability objectives through the mandatory implementation of the Minimum Environmental Criteria (CAM), including minimum quotas for organic products, traceability systems, environmental standards and quality-based award criteria. Second, the procurement system operates within a territorially embedded agri-food context characterised by fragmented production structures and a high prevalence of SMEs. The metropolitan food system of Rome combines extensive agricultural production areas, multifunctional peri-urban agriculture, logistics infrastructures and differentiated food distribution networks. Third, the scale and organisational complexity of metropolitan school catering make it possible to analyse how sustainability objectives are translated into concrete coordination requirements that affect supply-chain organisation. Finally, the inclusion of short-supply-chain requirements within the tender conditions, and specifically the insertion of a contract condition requiring the supply of food produced within 300 km as the crow flies from the Campidoglio (i.e., Rome City Hall), allows the market to be localised within the Lazio region.

The empirical material consists primarily of procurement and institutional documents. These include all tender documents, i.e., the *bando di gara*, the *capitolato speciale d'appalto*, technical annexes, award criteria, contractual clauses and CAM-related specifications associated with the Roma Capitale tender. Additional institutional and sectoral reports

were analysed to contextualise the broader organisational characteristics of school catering procurement in Italy. In particular, the study draws on the 2024 ANAC national survey on school catering procurement, which examined 195 contracts and highlighted the growing organisational complexity associated with sustainability-oriented procurement, including traceability obligations, continuity guarantees, quality monitoring systems and logistical integration requirements.

Methodologically, procurement documents are treated not simply as formal legal texts but as policy instruments through which public authorities organise market relations and structure operational coordination. In this perspective, procurement architecture is analysed as a governance mechanism translating sustainability objectives into concrete organisational and logistical requirements. The analysis, therefore, focuses not only on the formal inclusion of sustainability criteria but also on the operational conditions through which these criteria become implementable within large-scale procurement systems.

The analytical strategy combines three interconnected dimensions.

First, a legal-institutional analysis reconstructs the evolution of sustainable procurement governance in Italy and the European Union, with particular attention to the role of the CAM and the increasing policy emphasis on environmental sustainability, food quality and traceability within school catering procurement.

Second, a qualitative content analysis of procurement documents was conducted in order to identify the organisational requirements embedded within the tender architecture. Particular attention was devoted to provisions concerning continuity of supply, logistical integration, certification systems, metropolitan-scale delivery, monitoring procedures and quality-control obligations. This analysis revealed that sustainability objectives are systematically linked to operational coordination requirements extending well beyond environmental compliance alone.

Third, the study develops a supply-chain reconstruction aimed at analysing how procurement requirements interact with the structural characteristics of the agri-food system. Rather than assuming a direct relationship between public authorities and agricultural producers, the analysis reconstructs the organisational relations linking contracting authorities, catering companies, wholesalers, logistics operators and producers across different stages of procurement implementation (Table 1).

Table 1. Analytical dimensions and empirical sources.

Analytical Dimension	Main Empirical Sources	Analytical Objective
Legal-institutional analysis	EU directives, CAM, Italian procurement regulation	Reconstruction of the sustainability governance framework
Procurement document analysis	Tender documents, technical specifications, and award criteria	Identification of organisational and coordination requirements
Sectoral contextualisation	ANAC reports and institutional studies	Analysis of procurement trends and organisational complexity
Supply-chain reconstruction	Procurement architecture and organisational relations	Analysis of coordination structures and participation mechanisms

Authors' elaboration.

The analysis identified a set of recurring coordination requirements embedded within procurement architecture. These include: (i) continuity guarantees linked to large-scale daily provision; (ii) traceability and certification systems; (iii) logistical integration requirements; (iv) monitoring and reporting obligations; and (v) standardisation pressures associated with metropolitan-scale service provision. Sustainability requirements are there-

fore operationalised through broader organisational infrastructures that selectively favour actors with different coordination capacities (Table 2).

Table 2. Main procurement requirements identified through document analysis.

Procurement Requirement	Operational Implications	Organisational Effects
Organic sourcing quotas	Stable certified supply networks	Advantage for structured supply chains
Traceability systems	Monitoring and reporting capacities	Increased administrative complexity
Continuity guarantees	Risk management and substitution capacity	Need for integrated coordination
Metropolitan-scale delivery	Storage and transport infrastructures	Advantage for large operators
Quality-based award criteria	Technical and managerial expertise	Higher entry thresholds
Standardised service provision	Supply aggregation and coordination	Centralisation pressures

Authors' elaboration.

This mechanism-oriented approach does not seek to quantitatively measure procurement performance or statistically evaluate SME participation rates. Rather, the objective is explanatory: to identify how sustainability-oriented procurement architectures reorganise coordination structures and redistribute participation opportunities across supply chains.

This methodological perspective also responds to critiques within procurement studies concerning the tendency to analyse sustainable procurement primarily at the level of formal policy objectives. Instead, the paper examines how sustainability is translated into concrete governance arrangements and how these arrangements interact with pre-existing territorial and organisational asymmetries.

At the same time, important limitations must be acknowledged. The study focuses on a single metropolitan case and relies primarily on documentary and organisational analysis rather than extensive interview material or firm-level quantitative data. Consequently, the findings are not intended to be statistically representative of all procurement systems. Rather, the Rome case is treated as a theoretically significant and analytically rich case capable of revealing broader governance tensions associated with sustainability-oriented procurement in fragmented agri-food systems. The analysis should be regarded as a stepping stone for further research on these issues. The dynamics at play in the selected case study and identified in this paper could be relevant to the study of food procurement in other big metropolitan cities in developed countries.

Finally, the analysis adopts a relational understanding of procurement markets. Procurement is conceptualised not as a neutral allocation mechanism, but as a policy instrument that interacts with existing territorial, organisational, and logistical structures. This perspective makes it possible to analyse sustainable public procurement not only as an environmental policy tool, but also as a governance mechanism capable of selectively reorganising market coordination and participation relations within procurement-driven agri-food systems.

4. Results

The empirical analysis highlights how the implementation of sustainable public procurement in the school catering sector produces a structured yet uneven reconfiguration of agri-food supply chains, shaped by the interaction between sustainability regulation, procurement design, organisational requirements and territorial production systems. The legal-institutional analysis shows a progressive strengthening of environmental, qualitative and organisational criteria within Italian school catering procurement, particularly

following the consolidation of the Criteri Ambientali Minimi (Minimum Environmental Criteria) framework under Article 34 of Legislative Decree 50/2016 (the law in force at the time the tender was issued). The 2024 survey conducted by the Autorità Nazionale Anticorruzione (ANAC, Italian National Anti-Corruption Authority) on school catering procurement confirms the increasing integration of sustainability requirements, traceability systems, monitoring obligations and quality-management procedures within procurement systems nationally. The report analysed 195 procurement procedures and identified large metropolitan contracts as particularly relevant because of their economic scale, organisational articulation and integrated service requirements. Within this framework, the Roma Capitale procurement cycle is explicitly identified as one of the most economically significant and organisationally complex school catering systems in Italy. Issued in 2021 and covering the period September 2021–July 2026, the Rome procurement contract involved an estimated value of approximately €360 million, around 150,000 meals per day, more than 30 million meals annually and approximately 550 schools distributed across the metropolitan territory. The procurement system was divided into 15 lots corresponding to Rome’s metropolitan administrative subdivisions, although procurement management was simultaneously centralised within the Roma Capitale central administration. Approximately 85% of schools relied on on-site kitchens, and the system involved more than 3500 workers across the metropolitan territory. The organisational scale of the system is summarised in Table 3.

Table 3. School catering system in Rome Municipality (2021).

Indicator	Value
Contracting authority and tender	€360 million tender divided into 15 lots. This division reflects the subdivision of Rome into 15 metropolitan sub-areas with a certain degree of administrative autonomy. Before this tender, the contracting authorities were the 15 individual sub-municipal areas; however, since 2021, a centralised approach has been implemented, and the management of the procedure has been entrusted to the central bodies of the municipality.
Daily meals provided	~150,000
Annual meals	~30 million
Schools involved	~550
Share of on-site kitchens	~85%
Total staff involved	>3500
Contract duration	5 years
Procurement model	MEAT: 100 points attributed to the technical offer. Fixed cost of meals—security costs are not subject to a discount.

Authors’ elaboration.

A distinctive feature of the Rome procurement architecture concerns the adoption of the *Most Economically Advantageous Tender* criterion under Article 95(7) of Legislative Decree 50/2016. The evaluation system attributed the maximum score to technical quality criteria (100 points) while fixing meal prices and excluding labour-safety security costs from competition. This shifted competitive dynamics away from price reduction and toward organisational quality, sustainability compliance, monitoring systems and operational performance. Sustainability requirements extended well beyond environmental standards narrowly understood. In addition to obligations concerning organic sourcing thresholds and traceability systems imposed by the *Criteri Ambientali Minimi*, the tender incorporated requirements related to *Denominazione di Origine Protetta* (Protected Design-

nation of Origin) and *Indicazione Geografica Protetta* (Protected Geographical Indication) certified products, biodiversity protection, reduction of packaging impacts, seasonal sourcing, educational activities related to nutrition and food waste reduction, and social and solidarity agriculture initiatives linked to disadvantaged territories and earthquake-affected areas. As already mentioned, short-supply-chain requirements were also included within the contract conditions. *Life Cycle Costing* principles were also integrated into evaluation procedures, extending procurement assessment beyond initial production costs and incorporating environmental and operational impacts associated with the broader life cycle of food provision systems. Procurement documentation further shows that sustainability requirements were systematically connected to organisational dimensions such as continuity of supply, logistics management, traceability systems, quality-control procedures and administrative reporting obligations. These dynamics are consistent with broader national trends identified by the *Autorità Nazionale Anticorruzione* (ANAC, Italian National Anti-Corruption Authority), which highlights the increasing organisational complexity of school catering procurement systems and the growing integration of sustainability, logistics and monitoring requirements within institutional food services.

The regional policy framework reinforces these transformations. The *Complemento per lo Sviluppo Rurale della Regione Lazio 2023–2027* (Rural Development Complement for the Lazio Region 2023–2027) explicitly connects agricultural competitiveness, ecological transition and sustainable food systems to the objectives of the European Green Deal, the Farm to Fork Strategy and biodiversity policies. The regional strategy identifies organic agriculture, environmental sustainability, digitalisation, innovation systems, short supply chains and precision agriculture as strategic priorities for agricultural development and allocates substantial financial resources to these objectives, including more than €156 million dedicated to agri-food investment measures and approximately €78 million targeting productive agricultural investments. Public support measures similarly promote cooperative structures, producer organisations, network contracts and multifunctional agricultural systems integrating agritourism, renewable energy production, social agriculture and product transformation activities. Regional actors such as the *Agenzia Regionale per lo Sviluppo e l'Innovazione dell'Agricoltura del Lazio* (Regional Agency for the Development and Innovation of Lazio Agriculture), the *Istituto di Servizi per il Mercato Agricolo Alimentare* (Institute for Services to the Agricultural and Food Market), farmers' associations and *Centri di Assistenza Agricola* (Agricultural Assistance Centres) increasingly provide technical assistance, financial support and administrative intermediation related to certification systems, environmental upgrading and access to public funding schemes. At the same time, the reconstruction of the Rome metropolitan food system using data from the *Atlante del Cibo di Roma* highlights the coexistence of extensive agricultural production areas, peri-urban farming systems, fragmented logistics structures and differentiated supply chains within the metropolitan territory. The metropolitan food system combines intensive agricultural production, peri-urban cultivation areas, wholesale distribution infrastructures and fragmented territorial supply networks operating across heterogeneous organisational contexts. Agricultural production in Lazio remains characterised by a strong prevalence of small and medium-sized enterprises and fragmented farm structures, with many farms operating on limited surfaces and within territorially dispersed production systems [18,30]. Although these structures support product diversity, territorial embeddedness and multifunctional agricultural activities, the empirical findings reveal persistent tensions between local production systems and the organisational requirements embedded within metropolitan procurement systems.

The comparison between procurement requirements and the structural characteristics of regional agricultural production reveals several recurring organisational mismatches, summarised in Table 4.

Table 4. Structural alignment between procurement demand and SME-based supply systems.

Dimension	Procurement Demand	SME-Based Supply Structure	Resulting Effect
Production scale	Large, continuous volumes	Small-scale, fragmented farms	Access barrier
Certification requirements	High (organic, traceability, CAM)	Uneven adoption among SMEs	Selective inclusion
Logistical capacity	Integrated, centralised supply systems	Weak coordination and aggregation	Reliance on intermediaries
Product standardisation	Standardised menus	Diverse, seasonal production	Partial mismatch
Administrative capacity	High documentation requirements	Limited managerial resources	Compliance burden

Authors' elaboration.

Three organisational dimensions emerge particularly clearly from the analysis. First, the scale and continuity requirements associated with school catering exceed the productive and organisational capacities of most individual farms. The Rome procurement system required continuous daily provision involving approximately 150,000 meals distributed across hundreds of delivery points within highly standardised organisational procedures. Even though the tender was formally divided into 15 lots partly to facilitate broader participation, the organisational and financial dimensions of the contracts remained substantial. The largest procurement lot exceeded €8.6 million, while the remaining lots also required significant logistical and managerial capacities. As a result, participation depended not only on agricultural production itself but also on the capacity to guarantee continuity, manage substitutions, coordinate distribution systems and comply with extensive monitoring obligations. Second, certification and traceability requirements introduced substantial organisational costs. Procurement participation required the management of administrative reporting systems, environmental certifications, monitoring procedures and quality-control obligations in addition to productive capacity. Existing studies on Lazio's agricultural sector indicate that small and medium-sized enterprises frequently encounter difficulties in adopting integrated certification and traceability systems unless supported by higher levels of organisational coordination or external intermediation [30,31]. Third, logistical coordination represented a major operational bottleneck. Procurement implementation depended on integrated storage, transport and aggregation systems capable of ensuring continuity across multiple schools while responding rapidly to supply disruptions and maintaining compliance with traceability obligations. The empirical findings therefore suggest that the main constraints concern not only agricultural production capacity itself but also the organisational and logistical infrastructures required to support procurement implementation at a metropolitan scale.

The reconstruction of procurement-driven supply chains further highlights the central role played by intermediaries and large organisational actors in coordinating institutional food provision. Despite the formal subdivision of the Rome tender into multiple lots, contract allocation remained highly concentrated among a relatively limited number of large operators, including major cooperatives such as CIRFOOD, Vivenda and Gemos, multinational catering corporations such as Elio and Sodexo, and large national firms

including Dussmann Service, Ladisa and Serenissima Ristorazione. These actors performed coordination functions extending well beyond food provision itself, including sourcing, logistics management, quality control, traceability administration, supply aggregation and continuity guarantees. In several cases, the same operators managed multiple municipal or institutional catering services simultaneously, consolidating vertically integrated organisational structures across different territorial scales. The Autorità Nazionale Anticorruzione (ANAC, Italian National Anti-Corruption Authority) report similarly highlights the increasing concentration and organisational complexity of metropolitan school catering systems characterised by integrated operational requirements and large contract volumes. As a consequence, small and medium-sized enterprises participated predominantly through indirect forms of integration within procurement-driven supply chains coordinated by larger contractors and intermediaries. Catering companies and wholesalers performed strategic coordination functions involving aggregation of products from multiple producers, standardisation of supply, management of certification procedures, organisation of delivery systems and compliance monitoring. Existing regional studies further indicate that approximately 80% of organic food products used within school catering systems in Lazio are sourced from outside the region, despite the existence of significant local production potential [32]. Research on Lazio's organic agricultural sector attributes this outcome to fragmentation, weak coordination mechanisms, insufficient logistical integration and limited aggregation capacity among regional producers.

At the same time, the empirical material shows an increasing diffusion of associative and collaborative organisational forms within the Italian agri-food system, particularly through network contracts (*contratti di rete*). According to the Osservatorio Nazionale sulle Reti d'Impresa (National Observatory on Business Networks), the agri-food sector represents the leading sector in Italy in terms of participation in network contracts, involving 8267 firms organised across 1655 networks, corresponding to approximately 23% of all Italian firms participating in this form of inter-firm collaboration. The Lazio region alone accounts for 1172 agri-food firms participating in networks, representing the highest regional concentration nationally. Most of these organisational forms are structured as *rete-contratto* (contractual networks without legal personality), accounting for approximately 78% of agri-food network firms nationally. The available evidence suggests that these collaborative arrangements are used primarily to strengthen bargaining power, share technologies and inputs, coordinate innovation processes and facilitate participation in public tenders and funding schemes. The agri-food sector also emerges as the most represented sector within the broader national observatory on network contracts between 2019 and 2023. Existing studies emphasise that these associative structures frequently develop from pre-existing informal collaborations and evolve progressively toward more formalised coordination systems aimed at overcoming fragmentation, sharing organisational resources and improving market access. However, while these forms of associative coordination contribute to strengthening cooperation, resource sharing and collective innovation capacities, the empirical evidence suggests that they remain only partially aligned with the operational requirements associated with metropolitan-scale procurement systems. Existing associative forms often support environmental upgrading, innovation and access to funding without necessarily generating the level of logistical integration, collective planning and operational coordination required for continuous institutional food provision. The findings therefore reveal the coexistence of multiple and only partially aligned coordination structures within the regional agri-food system. On the one hand, horizontal forms of producer coordination are supported by regional agricultural policies, rural development programmes, network contracts and sustainability-oriented initiatives; on the other hand, vertically integrated coordination systems structured around large catering companies, wholesalers and lo-

gistics intermediaries are more directly aligned with the continuity, standardisation and compliance requirements associated with institutional demand.

5. Discussion

The findings of this study contribute to ongoing debates on sustainable public procurement (SPP) by moving beyond a predominantly normative interpretation of sustainability-oriented procurement and by focusing instead on its concrete organisational effects on agri-food supply chains. Rather than functioning as a neutral administrative instrument or as a purely environmental policy tool, the empirical evidence suggests that SPP operates as a governance infrastructure that actively structures market access, coordination mechanisms and organisational hierarchies within regional food systems. In this respect, the analysis shows how sustainability-oriented procurement reshapes agri-food supply chains through the interaction between legal requirements, procurement design and territorial production structures.

This interpretation aligns with broader perspectives that conceptualise markets not as autonomous arenas, but as institutionally constructed and politically organised systems [13,33]. Public procurement, in particular, has increasingly been understood as a strategic form of state-led market-shaping capable of directing competition, innovation and organisational behaviour through the structuring of demand [14,34]. At the same time, recent contributions have shown that market-shaping processes are intrinsically selective and may redistribute opportunities, organisational burdens and adjustment costs unevenly across actors [26]. Procurement systems do not merely regulate markets externally; they define the organisational conditions under which participation becomes possible.

The empirical findings from the Rome case strongly support this interpretation. Sustainability criteria do not simply introduce ecological standards into pre-existing markets; rather, they reorganise participation conditions by embedding procurement within dense systems of traceability, certification, continuity obligations, logistical coordination and administrative compliance. In this sense, SPP operates through what may be conceptualised as capability-dependent market structuring: access depends not only on productive or environmental performance, but increasingly on the capacity to internalise complex organisational and coordination requirements.

The school catering tender for the city of Rome illustrates this dynamic clearly. The adoption of the *Most Economically Advantageous Tender* criterion, the extensive use of technical scoring mechanisms and the integration of environmental and social requirements produce procurement architectures that reward actors capable of managing organisational complexity at a metropolitan scale. Sustainability, therefore, becomes operationalised through systems of coordination, monitoring and logistical integration rather than through environmental criteria alone. The central divide emerging from the analysis is thus not simply between sustainable and non-sustainable actors, but between organisations that are capable of governing the complexity associated with procurement-driven sustainability transitions and those that are not.

This dynamic partially recalls debates on the coexistence between market-making and market-embedding within public procurement systems [35]. Existing literature has highlighted how procurement simultaneously operates as a mechanism of market construction and as an instrument for embedding social, environmental or ethical constraints into market relations [28,36,37]. However, the evidence emerging from the Lazio case suggests a more asymmetrical configuration. Environmental and territorial objectives are incorporated into procurement systems that continue to rely heavily on competitive organisational selection, scale economies and vertically integrated coordination structures. Sustainability, therefore, does not replace market logics; rather, it is operationalised through them. In this respect,

the findings extend previous arguments concerning the tension between market-making and market-embedding by showing how sustainability-oriented procurement may simultaneously promote environmental goals while reinforcing organisational concentration and intermediation dynamics [35].

The analysis also nuances widespread assumptions concerning the relationship between SPP and local economic development. Although policy discourse frequently presents sustainable procurement as a mechanism capable of strengthening territorial economies, supporting local producers and fostering short food supply chains [38–40], the empirical evidence suggests that participation remains highly conditional upon organisational alignment with procurement requirements. The principal barriers identified in the analysis do not primarily derive from exclusionary legal rules, but rather from the structural mismatch between procurement architectures and the fragmented characteristics of regional agri-food systems.

This becomes particularly evident in relation to small and medium-sized enterprises. SMEs are not excluded *per se* from procurement systems. On the contrary, they remain structurally central within the Lazio agricultural system and increasingly participate in associative forms, multifunctional activities and collaborative organisational arrangements. The diffusion of network contracts (*contratti di rete*), cooperatives, and regional aggregation mechanisms demonstrates significant adaptive capacity within the sector [41,42]. However, the findings show that these associative forms do not automatically generate the level of operational coordination required by procurement systems. Procurement requires continuity of supply, synchronisation of volumes, standardisation, traceability and integrated logistics across hundreds of delivery points—conditions that remain difficult to achieve in fragmented production contexts.

As a consequence, SME participation assumes predominantly indirect and mediated forms. Rather than accessing procurement markets autonomously, smaller producers are integrated into vertically coordinated supply chains organised by large catering companies, wholesalers and logistics intermediaries. These actors perform essential coordination functions involving aggregation, certification management, quality control, distribution planning and compliance monitoring. Similar dynamics have been identified in studies on outsourcing and procurement governance, where market access increasingly depends upon the capacity to operate within hybrid and highly coordinated organisational environments [26,43,44].

From this perspective, the findings contribute to broader debates on governance hybridity and procurement coordination. Recent scholarship has argued that procurement systems increasingly operate through hybrid governance arrangements in which public institutions indirectly structure market relations through delegated organisational mechanisms rather than direct hierarchical control [43]. The Rome case confirms this tendency. Public institutions do not directly reorganise production systems; rather, they shape coordination structures indirectly through tender architecture, sustainability criteria and compliance mechanisms. Procurement, therefore, acts as an organisational infrastructure capable of redistributing responsibilities and coordination burdens across the supply chain.

Importantly, the findings also complicate the assumption that aggregation or lot-tization alone are sufficient to overcome SME disadvantages. Regional and European policies strongly promote associative behaviour, collaborative governance and producer coordination through rural development programmes, innovation funds and sustainability incentives. The Lazio context itself shows a growing diffusion of multifunctional enterprises, collaborative networks and agricultural innovation schemes supported by the *Complemento per lo Sviluppo Rurale 2023–2027*. Yet the persistence of external sourcing and intermediation suggests that the central limitation is not simply the absence of collaboration,

but the partial misalignment between horizontal associative structures and the vertically integrated coordination logic required by procurement systems.

This reveals a broader tension between horizontal and vertical coordination mechanisms. Horizontal networks are particularly effective in fostering cooperation, territorial embeddedness and resource sharing; procurement systems, however, require vertically integrated organisational arrangements capable of guaranteeing continuity, predictability and metropolitan-scale logistical coordination. Similar tensions have been identified in the literature on short food supply chains and public procurement, where attempts to localise food systems frequently encounter structural constraints linked to scale, standardisation and distribution capacity [39,40].

The findings also contribute to current debates on digitalisation and procurement governance. The growing use of electronic procurement platforms, digital traceability systems and integrated monitoring infrastructures undoubtedly enhances transparency, procedural standardisation and administrative control [45]. However, the analysis suggests that digitalisation primarily reduces informational and bureaucratic barriers rather than addressing deeper asymmetries related to logistics, coordination and productive scale. Digital tools may facilitate procedural access, but they do not fundamentally transform the organisational conditions required for participation.

More broadly, the study suggests that SPP should be understood as a selective and capability-dependent governance instrument. Its effects depend not only on sustainability objectives or regulatory design, but on how procurement architectures interact with the organisational and territorial characteristics of the supply base. Sustainability transitions within procurement systems therefore emerge as deeply dependent on coordination infrastructures, logistical capacities and organisational integration mechanisms rather than environmental regulation alone.

From this perspective, the paper also contributes to emerging discussions concerning the infrastructural role of the state within sustainability transitions. Rather than acting exclusively through direct intervention or traditional hierarchical regulation, public institutions increasingly govern through the indirect structuring of organisational environments, coordination systems and market conditions. SPP thus operates not merely as a purchasing mechanism, but as a governance technology capable of reorganising territorial economies through the selective shaping of access to institutional demand.

Finally, the findings suggest that policies aimed at strengthening the participation of SMEs and local producers within sustainable procurement systems cannot rely exclusively on environmental criteria or financial incentives. Supporting local participation requires investments in collective logistics, operational coordination infrastructures and supply-chain integration capacities capable of aligning fragmented territorial systems with the organisational requirements of institutional demand. Without addressing these coordination asymmetries, sustainability-oriented procurement risks reproducing forms of organisational concentration even while formally promoting local embeddedness, territorial sustainability and ecological transition. In this respect, the study contributes to broader debates within economic sociology, governance studies and sustainability transition research concerning the organisational conditions through which sustainability policies become operationally effective [46,47]. Figure 1 synthesises the main organisational mechanisms emerging from the analysis and conceptualises sustainable public procurement as a selective governance infrastructure shaping access, coordination and participation within agri-food supply chains. Building on the empirical evidence discussed above, the diagram illustrates how sustainability requirements become operational through procurement architectures, compliance systems and coordination mechanisms that selectively advantage actors capable of managing organisational complexity at the metropolitan scale. Rather

than directly excluding small and medium-sized enterprises, procurement systems tend to integrate them through mediated and vertically coordinated supply-chain arrangements. The figure also highlights the coexistence of sustainability-oriented policy objectives and competitive procurement logics, showing how their interaction contributes to the reconfiguration of territorial food systems. The graphical rendering of the conceptual diagram was supported by the use of Generative AI (ChatGPT-5.5, OpenAI) for visualisation purposes only. All analytical content, conceptual elaboration, and interpretation presented in the figure were independently developed by the authors. The broader policy implications emerging from these dynamics are discussed in Section 6.

Sustainable Public Procurement and the Reconfiguration of Agri-food Supply Chains

A selective governance mechanism shaping access, coordination and territorial effects

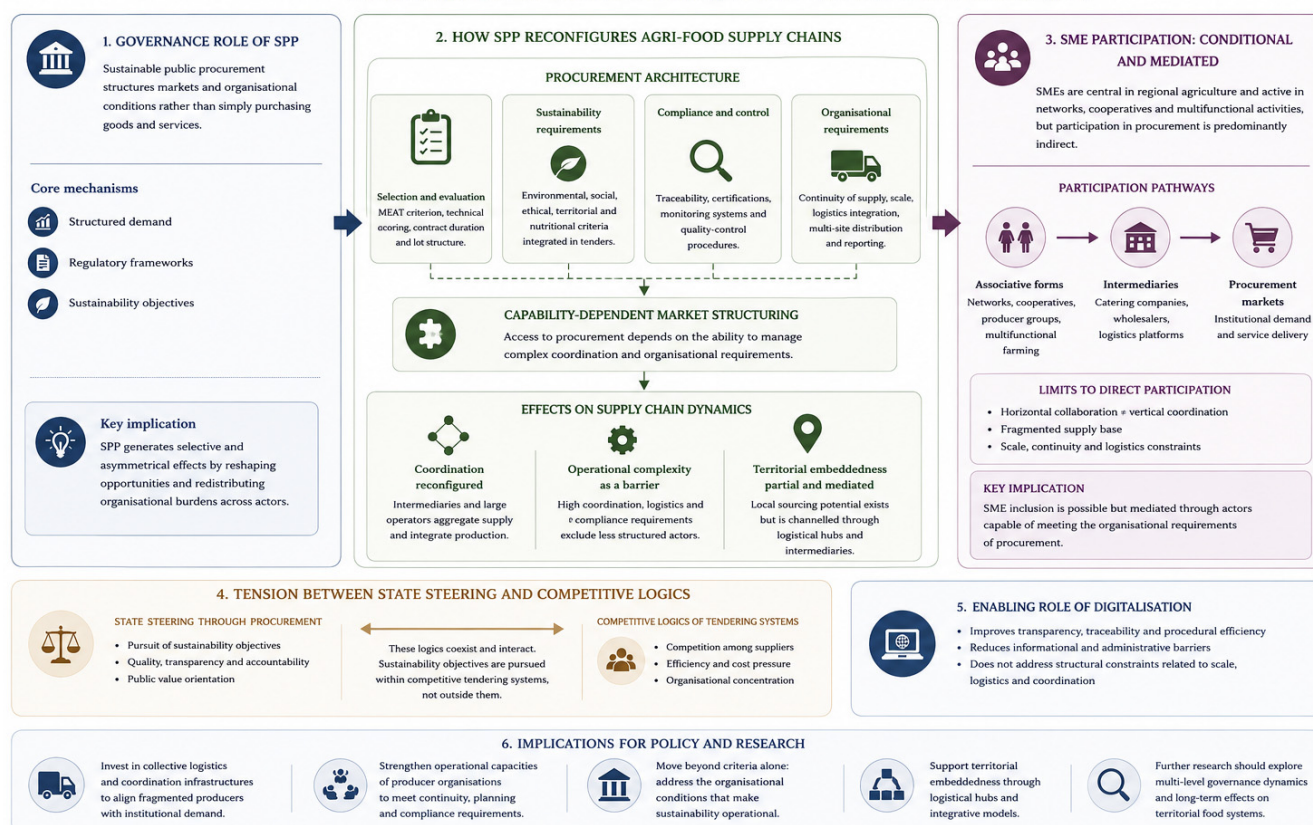


Figure 1. Sustainable public procurement and the reconfiguration of the agri-food supply-chain. Authors' elaboration. The visual diagram was generated with the support of ChatGPT (OpenAI) following detailed authors' instructions concerning the structure, graphical organization, and visual layout of the figure. The AI tool was used exclusively for graphic rendering purposes and did not contribute to data analysis, interpretation, or scientific content generation.

6. Conclusions

This paper investigated how sustainable public procurement (SPP) is operationalised within the school catering sector and how procurement-driven sustainability reshapes organisational relations within local agri-food systems. More specifically, the study addressed two interrelated questions: how sustainability requirements embedded within procurement systems are translated into concrete organisational conditions, and how these conditions affect the participation of small and medium-sized enterprises (SMEs) within procurement-driven supply chains.

The findings show that sustainability-oriented procurement cannot be understood simply as the introduction of environmental criteria into public purchasing. In the Rome

case, sustainability becomes embedded within a broader organisational infrastructure involving continuity obligations, certification systems, traceability mechanisms, monitoring procedures and integrated logistics. Procurement, therefore, acts not only on what is purchased, but also on how production, coordination and distribution are organised across the supply chain. In this respect, the study supports recent process-oriented approaches emphasising that policy-driven sustainability transitions emerge through the interaction between institutional arrangements, organisational rules and actor networks [48]. It argues that sustainable public procurement should be understood as a selective and asymmetrical market-shaping instrument.

From this perspective, the paper shows that the effects of SPP are strongly mediated by organisational capacity. The Rome procurement system required a level of coordination and operational integration that favoured actors capable of managing complexity at a metropolitan scale. Sustainability objectives were translated into procurement environments characterised by high coordination intensity, where access increasingly depended on the ability to combine logistics, compliance, continuity and administrative management within unified organisational structures.

The analysis also demonstrates that the relationship between SPP and local production systems is more ambiguous than often assumed in policy discourse. While procurement frameworks formally encourage territorial embeddedness, short supply chains and SME participation, the empirical evidence suggests that fragmented agri-food systems encounter significant difficulties in adapting to the operational requirements imposed by large-scale procurement systems. In the region where the chosen case study operates, namely Lazio, SMEs remain structurally present within the food system but participate predominantly through indirect and mediated forms of integration organised by large catering companies, wholesalers and logistics intermediaries. This confirms broader observations showing that participation in procurement systems is often capability-dependent rather than simply determined by formal access rules [49]. The paper therefore contributes to the literature on procurement and SMEs, demonstrating that attention should move from whether SMEs participate in, and take advantage of, procurement opportunities to understanding how participation is structured and through which organisational forms it becomes possible.

In this respect, the study suggests that the central issue is not the absence of local productive capacity, but rather the partial misalignment between fragmented territorial systems and procurement architectures based on continuity, predictability and standardisation. Even where local production potential exists, the ability to transform this potential into stable procurement participation depends on organisational infrastructures that many smaller actors struggle to internalise autonomously.

The findings similarly complicate assumptions surrounding aggregation and associative governance. Network contracts (*contratti di rete*), cooperatives and producer organisations undoubtedly strengthen collaboration, resource sharing and access to funding opportunities. However, the analysis indicates that horizontal forms of coordination do not automatically translate into the operational integration required by procurement systems. The coexistence of collaborative producer networks and highly centralised procurement coordination structures therefore emerges as one of the central tensions shaping contemporary sustainable food governance. Similar tensions between horizontal cooperation and vertically integrated coordination structures have been identified in studies on procurement-driven food systems and sustainability transitions [38,40].

More broadly, the paper contributes to debates on sustainability governance by showing that ecological transition processes are deeply dependent on organisational infrastructures and coordination mechanisms. Sustainability objectives become effective only when translated into operational systems capable of ensuring continuity, traceability and logisti-

cal integration. In this sense, procurement-driven sustainability simultaneously promotes environmental transformation while reinforcing specific organisational hierarchies within supply chains. In line with recent contributions combining institutional and narrative approaches to collective action, the study shows that procurement systems contribute to stabilising networks of heterogeneous actors through the alignment of organisational rules, coordination mechanisms and operational objectives [48,50].

The paper also highlights the strategic role played by intermediaries within procurement-driven food systems. Large catering operators, wholesalers and logistics platforms do not simply connect supply and demand; they actively stabilise coordination across fragmented production environments by aggregating volumes, managing certifications, organising deliveries and ensuring compliance with institutional requirements. Their centrality suggests that sustainable procurement increasingly functions through hybrid governance arrangements in which public objectives are operationalised through complex inter-organisational coordination systems.

These findings carry several policy implications. First, policies aimed at strengthening SME participation in sustainable procurement systems should focus not only on environmental standards or formal aggregation mechanisms, but also on the development of collective logistical infrastructures and operational coordination capacities. Second, greater integration between procurement policies and rural development strategies appears necessary in order to reduce the gap between supply-side support measures and the organisational requirements associated with institutional demand. Third, greater attention should be devoted to the governance role of intermediaries, particularly regarding how coordination power and market access are distributed within procurement-driven supply chains.

Finally, although the analysis focuses on the Rome metropolitan context, the dynamics identified in the study are likely relevant beyond the specific case examined here. The expansion of sustainability-oriented procurement across Europe suggests that similar tensions between environmental objectives, organisational complexity and territorial inclusion may increasingly characterise institutional food systems more broadly. Future research could therefore explore how different territorial configurations, governance arrangements and logistical infrastructures shape the capacity of local production systems to participate in procurement-driven sustainability transitions.

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