

Do Localization and Industrial Clusters Drive Agri-food Competitiveness? Insights from the Oran Territory-Algeria

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Abstract;

This paper examines the role of industrial localization and cluster dynamics in shaping agri-food competitiveness within the Oran territory. Grounded in the frameworks of localized production systems (LPS) and Marshallian industrial district theory, the study draws on an empirical survey of 61 firm managers conducted across the wilaya of Oran and six neighboring wilayas, complemented by updated statistical data. The analysis explores inter-firm linkages, multi-dimensional proximity, geographical, organizational, and cultural, and the extent to which shared territorial resources generate measurable competitive gains. Results indicate that while the structural preconditions for clustering are present, the transition from passive agglomeration to active collective efficiency remains constrained by limited inter-firm cooperation, weak institutional coordination, and insufficient public-private synergy. The paper contributes to the literature on industrial dynamics in developing economies and formulates policy recommendations aimed at strengthening territorial competitiveness in northwest Algeria.

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1. Introduction

The question of how firms benefit from their territorial environment has long occupied economists, geographers and regional scientists alike. Since Marshall's seminal observations on industrial districts in late nineteenth-century England, scholars have sought to understand the mechanisms by which geographic concentration of firms generates collective efficiency beyond what individual firms could achieve in isolation. This body of work has given rise to a rich theoretical tradition encompassing industrial districts, localized production systems (LPS), clusters, and more recently, territorial innovation models.

In Algeria, and more specifically in the Oranais territory, encompassing the wilaya of Oran and its surrounding region, the agri-food sector represents one of the most dynamic industrial branches, accounting for a significant share of employment and output; recent work on the dairy sub-sector illustrates both the strategic weight of agri-food activities for national food security and the persistent coordination gaps between production, processing and regulation (Mamine et al., 2021). Yet despite this dynamism, the sector remains largely fragmented, with limited inter-firm cooperation and underdeveloped collective action mechanisms. This raises a fundamental question: to what extent do agri-food firms in the Oranais territory form cluster-like structures, and how does the resulting industrial organization influence their competitiveness?

This paper addresses this question by mobilizing the theoretical framework of industrial clusters and localized production systems. We argue that the Oranais territory presents structural features conducive to cluster formation, notably spatial agglomeration, sectoral concentration, and multi-dimensional proximity, but that the transition from agglomeration to genuine collective efficiency remains incomplete. Our analysis draws on an original empirical survey of over 60 agri-food firm managers in Oran and its region, enriched by secondary statistical data.

The paper is organized as follows. Section 2 presents the theoretical framework and reviews the relevant literature on industrial clusters and territorial competitiveness. Section 3 outlines the research methodology. Section 4 analyzes the empirical evidence on clustering dynamics in the Oranais agri-food sector. Section 5 discusses the implications for policy and firm strategy, and Section 6 concludes.

2. Theoretical Framework: Industrial Clusters and Territorial Competitiveness

The concept of the industrial cluster, popularized by Porter (1990), refers to geographic concentrations of interconnected firms, specialized suppliers, service providers, and associated institutions in particular fields that compete but also cooperate. Clusters are said to enhance

competitiveness through three main channels: increasing productivity, stimulating innovation, and facilitating new business formation. Porter's framework, however, builds on an older intellectual tradition rooted in the work of Marshall (1890), whose concept of the "industrial district" captured the agglomeration benefits enjoyed by firms co-located in specialized industrial communities.

2.1 From Marshall's Industrial Districts to Localized Production Systems

Marshall identified three sources of external economies arising from geographic concentration: the development of a local pool of skilled labor, the emergence of specialized input suppliers, and the circulation of knowledge and technological spillovers, what he termed the "industrial atmosphere". These Marshallian externalities create conditions under which firms benefit from their location not simply because of natural endowments, but because of the socio-economic fabric of the territory itself.

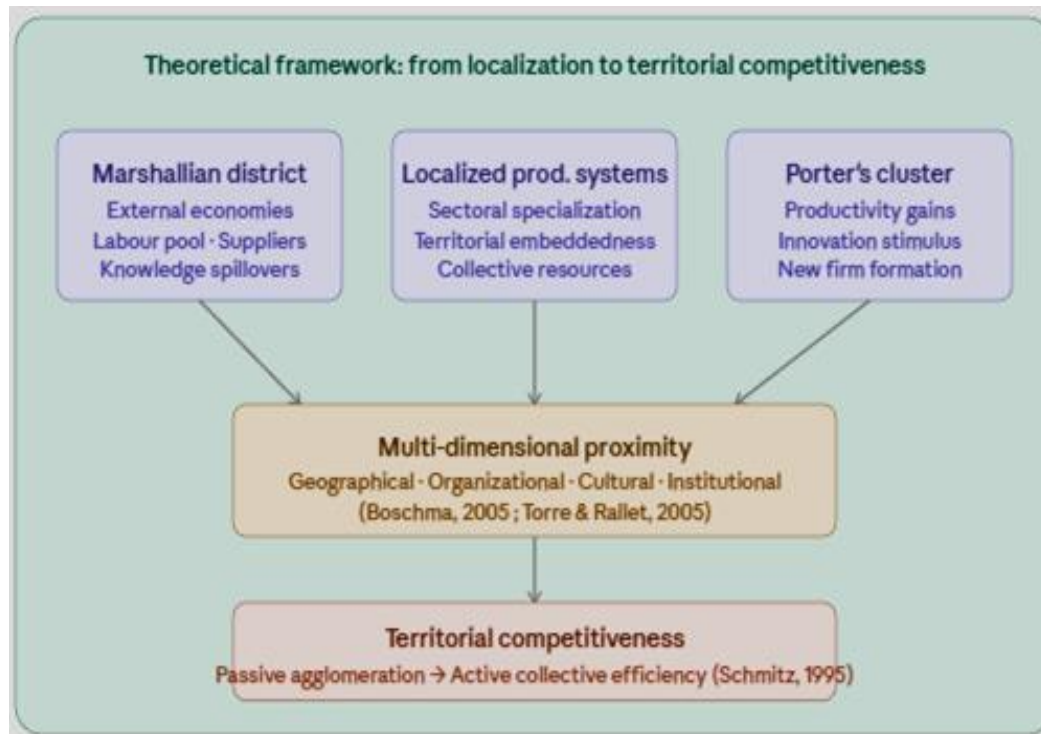
The Italian experience of the "Third Italy" in the 1970s and 1980s revived scholarly interest in Marshallian districts. Becattini (1990) reinterpreted the industrial district as a "socio-territorial entity characterized by the active presence of both a community of people and a population of firms in one naturally and historically bounded area." This conception emphasized the embeddedness of economic activity in social and cultural relations, a dimension that transcends purely economic optimization.

French economists subsequently developed the concept of *Systèmes Productifs Localisés* (Localized Production Systems, LPS), which extends the district concept to capture a wider variety of territorial productive organizations, including those found in developing and emerging economies (Courlet and Pecqueur, 1992). LPS are defined by the co-location of firms with strong sectoral specialization, dense inter-firm relationships, and the mobilization of collective local resources. This framework is particularly relevant to our analysis of the Oranais agri-food sector.

2.2 Cluster Dynamics and Collective Efficiency

Schmitz (1995) introduced the concept of "collective efficiency" to capture the competitive advantage that accrues to firms through clustering (figure 1). He distinguishes between passive advantages arising automatically from agglomeration, what he calls "passive collective efficiency", and those resulting from deliberate cooperation, termed "active collective efficiency." The former includes access to a common labor pool, shared infrastructure, and knowledge spillovers; the latter encompasses joint action in the form of subcontracting, shared services, lobbying, and collective marketing.

Figure 1. Conceptual schematic of LPS/Clusters



Source: Developed by the authors.

This distinction is crucial for understanding the situation of agri-food firms in the Oranais territory. As our empirical analysis will show, firms in the region benefit from proximity and agglomeration advantages, passive collective efficiency, but have yet to fully leverage the potential of deliberate inter-firm cooperation that would generate active collective efficiency and strengthen their competitive position more substantially.

2.3 Proximity, Territory, and Competitiveness

The French school of proximity economics (Boschma, 2005; Torre and Rallet, 2005) offers a complementary perspective by distinguishing between different dimensions of proximity: geographical proximity (physical distance), organizational proximity (similarity in organizational routines and knowledge bases), and institutional proximity (shared rules, norms, and values). This multi-dimensional conception of proximity is particularly relevant in contexts such as Algeria, where territorial dynamics are shaped by strong social networks, tribal affiliations, and informal institutional arrangements alongside formal economic structures.

Territorial competitiveness, in this framework, is not simply a function of firm-level efficiency but emerges from the quality of interactions between firms and their environment, the density of local institutions, and the capacity of territorial actors to coordinate around shared development

objectives. The Oranais territory, as we shall argue, possesses significant assets in terms of geographical and cultural proximity, but faces challenges in terms of organizational and institutional proximity that limit its collective competitive potential.

3. Research Problem and Hypotheses

Against this theoretical background, the central research question guiding this study is: To what extent does the agri-food sector in the Oranais territory exhibit the structural characteristics of an industrial cluster, and how do clustering dynamics influence the competitiveness of firms operating within this territorial system?

To address this question, we advance two working hypotheses:

H1: Agri-food firms in the Oranais territory benefit from proximity-based advantages, geographical, organizational, and cultural, that constitute the foundational preconditions for cluster formation and contribute positively to their individual competitiveness.

H2: The transition from passive agglomeration advantages to active collective efficiency remains limited in the Oranais agri-food sector, due to insufficient inter-firm cooperation, weak institutional coordination, and the absence of appropriate organizational forms (clusters, LPS, technopoles) capable of channeling territorial resources into sustained competitive gains.

4. Methodology

Our methodological approach is deliberately mixed, combining theoretical analysis with empirical investigation. The theoretical component involved a systematic review of the literature on industrial clusters, localized production systems, and territorial competitiveness, which allowed us to construct the analytical framework applied to our field of study.

The empirical component is based on an original field survey conducted in the Oranais territory encompassing the wilaya of Oran and six neighboring wilayas: Tlemcen, Mascara, Saïda, Aïn Témouchent, Mostaganem, and Relizane. The survey targeted agri-food firms with more than 10 employees (SMEs), both producing and distribution-oriented. Data were collected through face-to-face interviews with 61 firm managers: 34 in the wilaya of Oran and 27 in the wider region. Data processing was carried out using the Sphinx Plus2-V5 software.

The questionnaire covered four main dimensions: (i) firm profile and investment characteristics; (ii) nature and determinants of location choice; (iii) perceived proximity advantages and their forms; and (iv) the relationship between location, proximity, and competitiveness. This design allows us to

assess both the structural preconditions for clustering and the degree to which proximity advantages translate into competitive gains.

In addition to the survey data, we draw on secondary statistical sources, including the National Economic Census, data from the National Statistics Office (ONS), sectoral data from Agroligne (2017), and the spatial concentration analysis by Boudrama (2016) using Moran's Index for industrial branches across Algerian wilayas. Where more recent data are available, these have been integrated to update the empirical picture.

5. Industrial Agglomeration and Concentration in the Oranais Territory

5.1 Urban Dynamics and Agglomeration Trends

The last National Economic Census of 2011 revealed that the growth of agglomerations in Algeria is doubly characterized by a spectacular expansion of major northern cities and a proliferation of smaller agglomerations since the 1980s. The progressive return of security and civil peace after 1998 reinforced the urban network, which was strengthened by 172 additional agglomerations, including 6 large cities of over 100,000 inhabitants, 13 medium-sized cities (50,000–100,000 inhabitants), and 28 small towns (20,000–50,000 inhabitants) (Moussaoui, 2016). The total number of agglomerations rose from 2,221 in 1977 to 4,563 in 2008.

Oran emerged from this census as Algeria's second largest agglomeration, a status that constitutes the first structural precondition for cluster formation: the existence of a significant urban agglomeration generating market size, labor pool diversity, and infrastructure density. However, important imbalances persist across the three major components of Algerian territory (North, High Plateaus, South), and the urban hierarchy continues to be dominated by cities inherited from the colonial period (ONS, 2011).

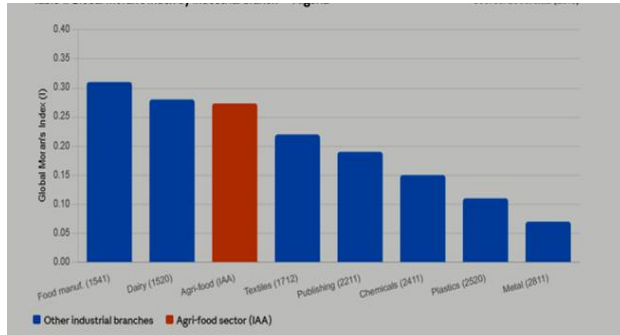
5.2 Spatial Concentration of Industrial Activities

To assess the spatial concentration of industrial activities in Algeria, we draw on the results of an exploratory spatial data analysis conducted by Boudrama (2016), which computed the Moran's Index (both global and local) for 12 industrial branches across Algerian wilayas. The global Moran's Index for overall industrial activities stands at 0.0286, indicating a statistically significant spatial concentration pattern across the country.

For the agri-food branch (IAA) specifically, the global Moran's Index stands at 0.2733, the third highest among all branches (figure 2), suggesting a pronounced tendency toward spatial concentration of agri-food employment. This concentration can be partly explained by the presenc

of a significant number of large firms (over 250 employees) in this sector, which accounts for 23% of total industrial employment (Agroligne, 2017).

Figure 2. Global Moran's Index by industrial branch-Algeria



Source: Adapted by the authors based on Boudrama (2016)

At the local level, Oran ranks fourth overall (Moran's Index = 0.390) after Algiers, Boumerdès, and Tipaza, reflecting its importance as an industrial concentration hub. However, when the local index is computed specifically for the agri-food branch, Oran does not appear among the wilayas with statistically significant local concentration. This finding, paradoxical at first glance, reveals that while Oran concentrates industrial activity in general, the agri-food sector is more diffusely distributed across the region, which has important implications for cluster formation dynamics.

6. Cluster Dynamics: Proximity, Inter-firm Linkages, and Competitiveness

6.1 Firm Profile and Location Characteristics

The 34 agri-food firms surveyed in the wilaya of Oran are predominantly private, productive industrial enterprises. Nearly 59% employ fewer than 100 workers, while over 40% have workforces exceeding 100 and reaching up to 600 employees. The vast majority (91%) are parent companies (headquarters), rather than subsidiaries, a factor that enhances the analytical relevance of the survey, as parent companies make location decisions for their affiliates. Family investment accounts for 55% of the surveyed firms, consistent with the broader entrepreneurial culture in Algeria.

The majority of surveyed firms (82.4%) indicate that their location was voluntarily chosen, with over 70% owning their land outright. Regarding satisfaction with current location, approximately 60% of firms express overall satisfaction (at varying degrees), while 23.5% are entirely dissatisfied, with 67% of the latter expressing a desire to relocate, primarily to industrial zones (73%) or better-adapted activity zones.

6.2 Proximity Advantages in the Wilaya of Oran

A central question of our survey concerned the nature of advantages that firms derive from their current location (Table 1). The data reveal that proximity advantages, in their various theoretical forms, are recognized by over 88% of respondents. Geographical proximity (clients, road, port, and airport infrastructure, neighboring wilayas) dominates, but organizational proximity (administrative proximity, local institutions) and cultural proximity (city center location, social embeddedness) are also well represented.

Table 1. Proximity advantages and competitiveness : survey results

Indicator	Oran wilaya (n=34)	Oranais region (n=27)	Total (n=61)
Firms recognizing proximity advantages	88.2%	85.2%	87.0%
Voluntary location choice	82.4%	78.0%	80.4%
Location positively affects competitiveness	64.7%	59.3%	62.3%
Main competitive advantage: raw material proximity	42.3%	42.3%	42.3%
Skilled labour & local know-how	23.0%	23.0%	23.0%
Firms with export activity	17.6%	11.1%	14.8%
Family-owned firms	55.0%	53.8%	54.5%

Source: Author's survey.

Crucially, 64.7% of surveyed managers affirm that their competitiveness is positively affected by their location. Three main dimensions of this competitive effect stand out: proximity to raw materials (cited by 42.3% of respondents), access to a qualified local workforce and local know-how (23%), and advantages in terms of production and transport costs. However, the competitiveness gains appear primarily oriented toward the domestic market, as only 6 of the 34 firms (17.6%) report export activity, a finding that highlights the limited international outreach of the cluster and the gap between proximity advantages and full exploitation of collective efficiency.

6.3 Proximity Advantages in the Wider Oranais Region

To deepen the analysis, the survey was extended to six neighboring wilayas: Tlemcen, Mascara, Saïda, Aïn Témouchent, Mostaganem, and Relizane. The 27 firms interviewed in the region exhibit similar structural characteristics to those in Oran: predominantly private, productive SMEs, largely family-owned (53.8%), with 92% being parent companies.

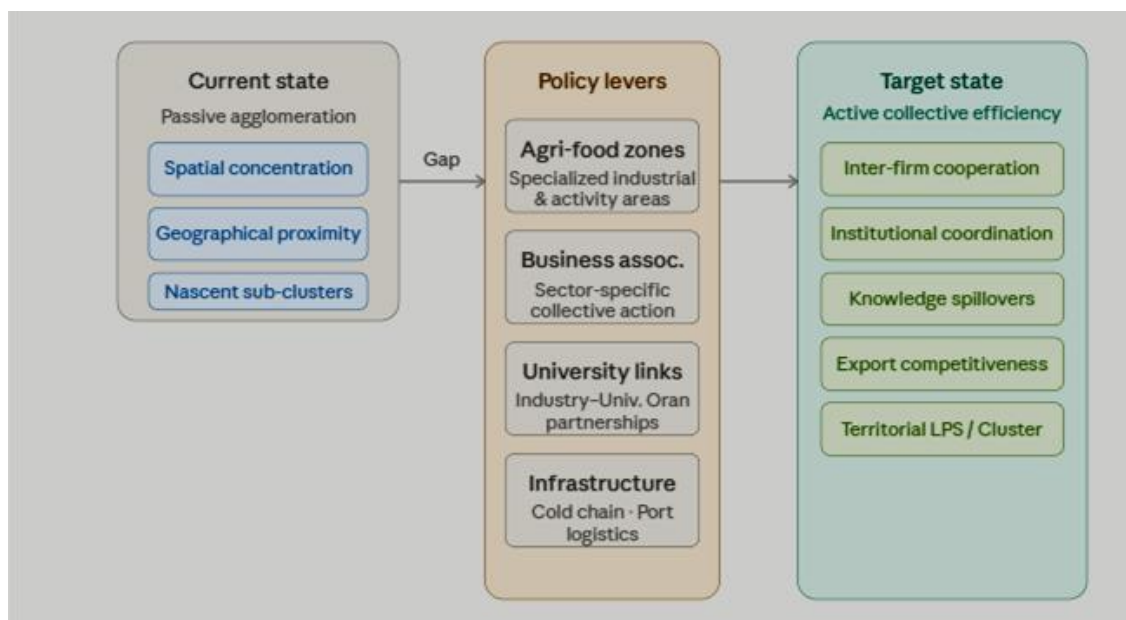
The regional data reveal a distinctive feature absent from the Oran city results: proximity to other producers and notoriety effects (40.74% of respondents). This finding points to nascent cluster dynamics at the sub-regional level, where sector-specific agglomerations are generating reputational externalities and inter-firm awareness. The most salient examples are the olive processing cluster in the wilaya of Mascara and the carob transformation activities in the wilaya of Tlemcen.

Across the full regional survey, approximately 60% of managers confirm the existence of a positive link between location and competitiveness, with proximity to raw materials (42.3%), access to skilled labor (23%), and cost advantages in production and transport emerging as the principal competitive mechanisms. These findings confirm Hypothesis H1: proximity-based advantages constitute genuine competitive assets for agri-food firms in the Oranais territory.

6.4 Toward Collective Efficiency: Opportunities and Constraints

While the survey confirms the presence of passive collective efficiency (Figure3), arising from agglomeration and proximity, the evidence for active collective efficiency is more limited. Inter-firm cooperation remains largely informal and underdeveloped. With the notable exception of the olive processing sub-cluster in Mascara, most firms operate in relative isolation, failing to leverage the potential synergies available within their territorial environment.

Figure 3. Synthesis diagram: from a passive cluster to active collective efficiency



Source: Developed by the authors.

Several structural constraints account for this gap. First, the predominantly family-owned nature of Algerian firms creates a culture of confidentiality and individual self-reliance that militates against inter-firm cooperation. Second, the institutional environment, characterized by weak business associations, limited industrial policy coherence, and insufficient university-industry linkages, fails to provide the coordination mechanisms necessary for active cluster formation. Third, the spatial diffusion of the agri-food sector across the region makes it harder to achieve the critical mass of co-located specialized firms that would generate strong intra-cluster knowledge spillovers. These constraints confirm Hypothesis H2.

7. Discussion and Policy Implications

Our findings paint a nuanced picture of the Oranais agri-food sector as a territory in transition: one that possesses the foundational preconditions for industrial clustering, agglomeration, concentration, multi-dimensional proximity, and nascent sub-regional specialization, but has not yet fully activated the cooperative mechanisms that would transform these structural assets into sustained competitive advantage.

For the Oranais agri-food sector specifically, we identify four priority policy levers. First, the development of specialized industrial and activity zones dedicated to agri-food activities would enhance spatial concentration and facilitate inter-firm interaction. Second, the strengthening of sector-specific business associations would provide the organizational infrastructure for collective.

Third, fostering university-industry partnerships, particularly with the University of Oran, would help develop the local knowledge base. Fourth, targeted public investment in logistics infrastructure, cold chain facilities, port connections, agri-food processing parks, would enhance the regional territory's competitive platform.

8. CONCLUSION

This paper has examined the extent to which the agri-food sector in the Oranais territory exhibits cluster-like dynamics and how these dynamics influence firm competitiveness. Drawing on the theoretical frameworks of industrial clusters, localized production systems, and proximity economics, and building on an original empirical survey of 61 firm managers, we have shown that the Oranais territory presents significant structural assets conducive to cluster formation, including a major urban agglomeration, a degree of industrial concentration, and multi-dimensional proximity advantages recognized by the vast majority of surveyed firms.

At the same time, our analysis has highlighted the gap between passive agglomeration advantages and active collective efficiency. The transition from the former to the latter requires deliberate institutional support, enhanced inter-firm cooperation, and organizational forms, such as LPS,

clusters, and technopoles, adapted to the specific territorial configuration of the Oranais region. The nascent sub-regional clusters observed in Mascara and Tlemcen offer promising models of how proximity and sectoral specialization can generate genuine collective competitive advantages when embedded in a supportive territorial system.

This study contributes to the growing body of literature on industrial clustering in developing countries and offers concrete policy recommendations for public authorities and firm managers seeking to enhance the competitiveness of the Algerian agri-food sector. Future research should extend the empirical base by incorporating more recent data and by adopting longitudinal methodologies capable of tracking the evolution of cluster dynamics over time.

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