Globalization, competitive advantages and the evolution of production systems: rural food processing and localized agri-food systems in Latin-American countries

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This paper reviews the rise of geographic concentrations of small food-processing units in rural areas of Latin America, in order to show that, drawing on the literature on the development of clusters, they may represent a type of local productive system, namely Local Agri-food Systems. Furthermore it assesses whether they might compete efficiently in global food commodity chains. In this regard it analyses the specific assets of these systems, drawing on some specific cases, and stresses the conditions that can enable them to compete on national or even global markets in the supply of processed products. These conditions appear to be a capacity for collective action which, in this particular case, will be enhanced by qualification processes of the products creating common assets for the actors involved. These elements could provide a rationale as regards the categorization of clusters according to their efficiency. Actually, although they won’t be able to achieve competitive efficiency in every case, some might, and it remains useful to set up a research programme on their trajectories of development.

Keywords: food commodity chains; clusters; Latin America; collective action; product typicity.

1. Introduction

Globalization has come to be one of the prominent features of the current trend of evolution of national economies. This is even more clear-cut for Latin-American countries, since they underwent a radical twist of their macroeconomic policies towards external liberalization in the 1980s and 1990s. The impact of these policies on industry has been documented at length: the fall of tariff and non-tariff barriers...
heavily hampered the industrial sectors inherited from the import-substitution inward-looking economic policies of the 1960s and 1970s. Conversely, in some countries new international sub-contracting industrial activities have emerged.¹

Still globalization has impacted agriculture and agribusiness too: if, on average, the trade balances of major Latin American countries have not deteriorated during the last decade, because exports and imports have soared at comparable rates, and if some export-oriented agricultural productions, carried on by large or medium commercial farms did well in the globalized food markets (soya in Brazil and Argentina, for example), basic food crop imports have risen due to the lack of competitiveness of the agricultural production systems predominantly composed of small subsistence farms with low technological levels and poor soil endowments.

At first sight, this can be explained by the fact that small subsistence farms cannot compete with world agribusiness which masters technology, holds control over capital resources and can hedge at world level between the costs of other factors, land and labour. This means that the only path to competitiveness in a globalized food market goes through the availability of production factors at the lowest possible cost level. However the current crisis of the physical productivity-biased model in developed countries that could pave the way for a more environment-friendly agriculture, and more focused on typical and quality products, shows that the production of low-cost ‘commodities’ could well not be the only future of agriculture and agribusiness.

An array of recent theoretical approaches, endogenous growth, economic geography or global value chain analysis, have stressed the idea that competitiveness on world markets rests on specific national or local conditions that does not amount only to the availability of cheap labour or natural resources, such as for example human capital pure externalities resting on the original branch specialization of nations (Lucas 1988), pecuniary externalities stemming from backward and forward linkages with proximity markets (Krugman 1991), the competitive advantage of nations stemming from the clustering of specific industries (Porter 1990). However, one can wonder whether these kinds of competitive advantage can apply to food production carried out by peasant or family agriculture in developing countries, such as to provide a way out of its progressive casting out.

This paper will assess this issue in the case of peasant economies of Latin-American countries through a tentative transfer of the analytical scheme of Local Production Systems and clusters to food and agriculture in developing countries; in this respect it will claim the importance of food processing activities. Although the traditional image of this sector is that of a great number of agricultural farms (thus not industrial) subdued to the might of a concentrated and globalized agribusiness, there exist dynamics of development of small agri-food businesses especially in developing countries (Lopez and Muchnik 1997). In some cases they show patterns of clustering. The characterization of these clusters could pave the way to the study of their likely competitiveness in the global agri-food commodity chains.

The organization of the paper will be as follows. Section 2 will show that the globalization process often goes, paradoxically, with the strengthening of the impact of local conditions of production and innovation. Section 3 will turn to the specific case of rural food processing by developing the concept of local rural food-processing systems and applying it to the case of the Latin-American rural peasant food processing sector (Agro-Industria Rural), which seems to be driven at least partly by clustering processes. Section 4 will focus on the issue of the integration of these systems to food
commodity chains at the local, national or even global level. Section 5 offers some concluding remarks.

2. Globalization and the Local Production System (LPS) issue

Globalization is seen as a new stage of the internationalization of national economies: ‘internationalisation refers to the geographic spread of economic activities across national boundaries. As such it is not a new phenomenon . . . . Globalization is much more recent than internationalisation because it implies functional integration between internationally dispersed activities’ (Gereffi 1999).

Until the 1970s the process of internationalization referred mainly to the development of multinational firms, with subsidiaries and production units in various countries. They aimed at securing for their products the best position available in these various national markets, each one with specific features and often protected by inward-looking import substitution policies. They were, to quote Porter (1990), more ‘multidomestic’ than global. On the contrary, over two decades:

- trade liberalization of goods and production factors has led to a growing trans-boundary integration of good markets and yet more of factor markets: hence the so-called financial globalization for capital and the many processes of de-localization of activities in search of lower labour costs;
- production integration of multinational groups and firms is developing at a global level not only through a network of subsidiaries, but also by externalization in the form of international sub-contracting of networks of SMEs, integrated to the global organization of production. In this setting international trade turns out to be more and more made of intra-group or intra-network flows of inputs and outputs along ‘global value chains’ (Porter 1990).2

However:

- globalization goes along with production system variety and therefore the importance of localization, as shown by the analysis of ‘competitive advantages of nations’ in a global economy (Porter 1990);
- localization of economic activities under globalization often leads to clustering of activities in specific locations.

2.1 Globalization and production system variety

Globalization does not homogenize all national production systems or even all markets as it does not wipe out segmentation between countries or even regions.

Some good markets are truly global, in particular component or investment goods markets or, in the consumer goods sector, household equipment or consumer’s electronics, given the trend towards process and product normalization at the world level. However, there remains an irreducible variety between national markets of consumer goods, even for durables: in the global car industry, for example each national market still retains specific features that hamper the global management of products. Moreover, in some branches, globalization of consumption patterns is still quite low: this is the case in particular in food markets, the national or even regional
character of which does not seem to wane, despite the emergence of global firms in this branch.

As far as productive systems are concerned, it may seem at first glance that some spatial homogenization, due to homogenization of production, price and quality environments achieved by competition could be triggered by globalization. Among alternative localizations, the advantage would go to those where lowest-cost factor resources are available, given the high mobility of capital. Porter (1990) has stressed that, in a global economy, competitive advantage is determined by a system of relationships between various elements, such as firm strategies, structure and rivalry in the markets, factor conditions, demand conditions and related and supporting industries (the ‘diamond’ of competitiveness). Each of these elements has national features, which determines a specific interplay between them. In particular he stresses the part played by forward and backward linkages between industries at national levels, which designs the ‘competitive advantage of nations’. This ‘competitive advantage’ entails the clustering of given industries in given nations so that each nation within a globalized world retains an idiosyncratic production system, with specific productive and organizational skills in some branches, and specific features of domestic demand.

This approach of global competitiveness of nations can be transferred at the local level: Porter (1990) believes that the processes of mutual reinforcement between the peaks of the ‘diamond’ are enhanced by geographic proximity. Hence the existence of local clusters of competitive industries. Consequently local competitiveness rests less on the local availability of natural resources and low wage costs and more on the quality of human resources, innovative skills and the quality or forward and backward linkages existing in different areas. This transfer to the local level of an analysis made at the national level can also be found in Krugman (1991, 1996) who applied his New International Economics modelling framework to scrutinize the influence of increasing returns on the localization of economic activities, and the geographical concentration of these activities in specific areas. Similarly Lucas (1988) stresses the role of human capital as a source of increasing returns, and consequently of endogenous growth at the national level; at the same time he characterizes human capital as a ‘force’ stemming from proximity of economic agents which allows for a transfer of the endogenous growth paradigm to the local level. The variety of national productive systems is therefore underpinned by the variety of local production systems.

2.2 Globalization and local clustering

The hypothesis of idiosyncratic features of local growth processes, which can account for increasing returns, has been substantiated over 20 years by the study of European thriving ‘industrial districts’ – localized Small and Medium Enterprise clusters – of the 1970s and 1980s, performed by originally Italian ‘Neo-Marshallian’ economists.

- These districts gathered a great number of SMEs, operating in the same branch, or in branches closely associated in input-output relationships.
- They marketed their production at a national or international level; this production consisted of small-scale series with a great deal of product varieties. They could therefore cater to a changing and diversified demand more accurately than the mass production of ‘Fordist’ large firms.
In these districts, one could witness co-operative-competitive relationships between SMEs. While competing for the same markets, they could also engage in productive capacity and workforce borrowing, and develop a generalized reciprocal sub-contracting. This behaviour accounted for the huge productive flexibility of these systems and allowed the rise of a variety of products and swift changes of product design and processes. Hence the name of flexible specialization systems (Piore and Sabel 1984) given to these concentrations of SMEs.

They displayed a set of intertwined local institutions, which promoted the specific economic activity of the area: local governments, professional organizations, technical education institutions, chambers of commerce, etc.

This co-operative behaviour which enhanced technological or market information diffusion was usually the outcome of a common history, culture and behaviour shared by the actors involved in the process. This historical process could relate either to industrial history or to political or religious history.

The theoretical analysis of Local Productive System dynamics is rooted in Marshall’s work, which stresses the part played by geographical proximity as a diffusion factor of specific technological externalities (workforce, innovation diffusion, etc.): they appear as an application of its branch externality theory to geographical concentrations of firms belonging to the same branch. ‘Neo-Marshallians’ (Beccatini 1979) relate these externalities to the importance of the sharing of common values, habits, historical experience, which accounts for a common identity and social basis by local entrepreneurs, and which allows for a better diffusion of information, a development of co-operation, enhancing a greater productive flexibility.

Proximity of values and behaviours lowers transaction costs, thus fostering a better resource allocation and a better efficiency of market transactions that may unfold between district actors (firms as well as employees): trust they feel towards each other minimizes the costs of opportunism, or of the contractual devices designed to remedy them. However, it does have also a specific impact on resource creation or innovation: knowledge diffusion and innovation are enhanced by the existence of a tight network of relationships between actors. The distinction introduced by evolutionary theory between codified knowledge, easily transferred, and tacit knowledge, drawing on skills and know-how, and for that reason, highly locally idiosyncratic, may usefully be mobilized in that case. Tacit knowledge draws on shared visions of the world, physical proximity of actors and interaction density, which are precisely to be found in specific locations. This explains that innovation processes that rest on such knowledge are not easily transferred outside their place of elaboration. As innovation processes intertwine the two kinds of knowledge, some locations may have a competitive innovative advantage. Knowledge spillovers stem from the internal communication flows in the districts, bearing on specialized inputs, main objects of transactions and information conveyed through relevant sectors and firms. They are not so much about technology transfer, the technology being entirely defined and constituted, as about technology creation: the relevant information deals about the existence of actors able to involve themselves in this technology creation processes. Furthermore there exist within Local Production Systems ‘interface structures’ between research and industry, often induced by local political initiatives.

The network of relationships involved in this process is part of a set of ‘specific assets’ (Pecqueur 1993), assets that cannot be found similarly shaped in other locations, which contrasts with generic resources, existing in numerous locations. As a matter of
fact, if these ‘specific assets’ can be exogenous, they are very often endogenous to the production system, built up by the very interaction of the actors within the organization (Boissin 1999). This collective action capacity, leading to innovation, goes far beyond the mere proximity externalities stressed by Marshall.

Although originally not linked analytically to the globalization process, these Local Production Systems (LPS) of SMEs, turned out to play a significant role in this process.

(1) They have achieved in many cases a level of competitiveness on global markets which accounts largely for the competitive advantage of the nation in which they have developed: Porter (1990), for example, underlines the part played by the Italian tile and ceramic industry in the building of the global competitive position of Italy, stressing that this industry consists mainly of localized clusters of SMEs.

(2) The analysis allows for a reshuffling of the theory of the localization of economic activities of multinational firms, insofar as the proximity of generic resources, such as raw materials for example, no longer plays a decisive role, given decreasing transportation costs and dematerialization of production. Specific assets are likely to play the leading part in their localization processes. For example the existence of a web of SME linked to an adequate institutional setting and to a level of training and skill of the local workforce in specific activities can induce large corporations to integrate them in their global production networks. Thus local settings have a considerable impact on the globalization process itself, because they are elements of the global strategies carried out by global firms.8

If Local Production Systems were identified first in developed countries, quite a few have been registered in many developing countries such as Brazil (Schmitz 1995, 1998, Azevedo 1996, 1998), Mexico (Rabelloti 1995, 1999), Peru, India, Pakistan (Nadvi 1998), Tunisia, etc. Even if they may not boast the entire set of characteristics of original districts,9 these geographical concentrations of SME display branch externalities and positive outcomes in terms of growth. Consequently the focus largely shifted from the characterization of existing Local Production Systems, using the industrial district model as a benchmark, to the identification of trajectories followed by clusters, their integration to global value chains and their contribution to economic development (Nadvi and Schmitz 1999). Clustering is a significant feature of the industrialization process of developing countries because it allows small businesses to come to grips with some constraints hampering their development: lack of financing, lack of economies of scale, inability to take risky steps, etc. This is due to the fact that collective action capacity can be an endogenous ‘specific asset’ of clusters, which goes beyond the mere existence of agglomeration externalities.

Nevertheless, while clustering can be a path to industrialization in developing countries, it is not a necessary outcome. First, many clusters of small firms manufacturing more or less the same product at a low technical level, while they are enjoying basic proximity externalities, seem to be unable to develop collective action or to set up a significant network of forward and backward linkages.

Second, the ability of clusters to develop is related to the capacity of differentiation between actors and firms within clusters, in order to reap benefits from specialization, but this implies, as well as differentiation between clusters, some kind of hierarchy within the cluster which could hamper eventually the development of collective action.
Altenburg and Meyer-Stamer (1999), studying Latin American clusters, thought that three categories could be identified:

- craftsmanship clusters with only basic proximity externalities, no collective action, few linkages and little innovative strength
- intermediate clusters in import-substitution sectors with more differentiation, some forward and backward linkages and collective action, having been able to adapt to a new competitive environment
- high-tech clusters stirred up by liberalization and made up of subsidiaries of TNC, integrated in the ‘global commodity chains’.

While pointing to some indicators that would allow categorization of existing clusters, this typology has been mainly set up for industrial sectors. As a matter of fact, up to now these analyses have been applied mainly to an array of industrial sectors, not included through the agricultural or agribusiness sector. This sector is often seen as being made up of a great number of agricultural farms (thus not industrial), some of them large, generally under the control of a powerful concentrated and globalized agribusiness. However there exist dynamics of development of small agri-food businesses especially in developing countries (Lopez and Muchnik 1997). In some cases they show patterns of clustering. The categorization of these clusters could pave the way to the study of their role in the globalized agri-food commodity chains, through a tentative transfer of the analytical scheme of Local Production Systems and clusters to food and agriculture in developing countries, in this case in Latin America.

- First we intend to characterize these systems linked to local agriculture as Local Agri-food Systems (LAS), a specific kind of Local Production System, specialized in agri-food activities. We will analyse their level of complexity and identify the specific assets of these LAS.
- Second, while the available data as of today might not enable us to set up a typology of the kind that has been proposed by Altenburg and Meyer-Stamer (1999), we intend to tentatively assess their potential and contribution to development; we will therefore review not only their agglomeration externalities but also their capacity for collective action; we will also identify the ways by which these clusters are integrated in commodity chains, whether at a local, national or international level.

3. Local Agri-food Systems as food-processing clusters in Latin America

Globalization of markets and firms is developing in food commodity chains: trade in agricultural commodities is important and increasing and production networks at the international level develop such as those set up by retailer supermarkets in Europe with the fruit and vegetable sector in Africa (Dolan et al. 1999). There are at least two specific features of this process in the food sector.

- Most agricultural markets are still national in essence. There remains a strong inertia of food patterns and a regional character of consumer’s preference (Rastoin 2001).
- Consequently SME in niche markets of regional or ‘typical’ products can be strong contenders in national or export markets (Rastoin and Vissac-Charles
1999), as well as global firms. This makes even more likely the existence of localized food clusters.

As a matter of fact clusters have been identified in agri-food commodity chains as in other sectors: for example agribusiness districts in Italy (Bianchi 2001) or Spain (Juste Carrion 1998) or food processing clusters in Latin America such as the poultry processing cluster of Western Santa Catarina State in Southern Brazil (Meyer-Stamer 1998). Although these cases are relevant, we will focus on a specific kind of food-processing cluster, stemming from the development of the rural food-processing industry in Latin America, given the momentum of this form and its link with peasant and family agriculture.

The issue of the rural food-processing industry (the Spanish Agro-Industria Rural [AIR]) takes place in the ongoing debate in Latin America on how to tackle the subsistence and income problems of small peasant units, threatened by market marginalization and division of land due to demographic growth. For that reason, initial contributions on AIR underlined heavily its capacity to improve the share of value added retained by small peasant units, and therefore its contribution to poverty alleviation.

The most common definition of AIR, put forward particularly by the IICA-created PRODAR network, provides a good example of this approach (Boucher and Riveros 1995, Machado Cartagena 1997): ‘Rural Food-processing Industry: Activity allowing for in rural areas the rise and conservation of peasant economy production value added, through the carrying out of post-harvest operations on the products, either agricultural, forestry or cattle-raising, such as selection, cleaning, sorting out, stocking, preservation, packaging, transport and commercialisation’.

AIR can be ‘induced’ in the case of the rural food-processing industry ‘borne from promotion endeavours carried out by governmental or non governmental organisations’ but it can also ‘appear(ed) spontaneously as a subsistence and accumulation form of peasant economies’ in the case of ‘traditional’ rural food-processing industry. In both cases, the development of this rural food-processing industry has often led to geographical concentration of small food-processing units. We shall mainly review several examples, taken from various field observations carried out in Brazil, Colombia and Peru, but more can be documented throughout the continent.

Colombia is the first per capita consumer and the second producer of panela a ‘traditional’ sugar. Panela production accounts for 5.8% of agricultural GDP and is carried out by small production units (trapiches), concentrated in several areas where ‘panelera’ sugar cane is widely cultivated: the breaking down of the cultivated area in 1992 shows that, while ‘panelera’ sugar cane was widespread in the 23 departments of Colombia, 58% of the total cultivated area lay in four of them, Boyaca, Santander, Cundinamarca and Narino. The census of trapiches made in the same document (Rodriguez 1992) shows that there existed more than 8000 trapiches in the country, but according to another document (Rodriguez et al. 1997) the Rio Suarez basin around the town of Barbosa produces 35% of the total production of panela with more than 700 trapiches. Moreover some 300 more operate around the town of Villeta in western Cundinamarca. We can also mention the concentration around Barbosa, in the Rio Suarez basin of more than 150 production units of bocadillos (variety of fruit paste made of guava and panela). Again in Colombia, rallanderias, production units of sour cassava flour, used in the production of pan de bono or pan de yucca, are concentrated in the surroundings of Santander de Quilichao in Northern Cauca.
Cheese-processing units are concentrated in some dairy cattle-breeding areas throughout Latin-American countries. For example, in the areas of Ubaté in Cundinamarca (Colombia) or Salinas (Ecuador), in Costa-Rica on the hills of Santa Cruz de Turralba, and in the department of Cajamarca in Peru or the area of Nossa Senhora da Gloria in Sergipe (Brazil), the two latter cases having been more systematically scrutinized. The department of Cajamarca hosts 12% of total bovine cattle of Peru and produces 16% of milk. A total of 30% of this milk is processed as cheese by thousands of small units located in the south of the department in some basins located around the city of Cajamarca. A significant part of cheese production is marketed outside the region (mainly coastal cities), through a cluster of 126 shops localized in the same area of the city of Cajamarca. Similarly over 60 ‘fabriquetas’ (small cheese-processing units), along with traders, concentrates in Gloria in the north-eastern State of Sergipe in Brazil, while surroundings ‘municipios’ have very few of these units (Cerdan and Sautier 1998); they market their product in neighbouring cities and states (such as Bahia and Pernambuco). Other cheese-producing clusters of AIR can be identified throughout Latin America.

AIR definition by PRODAR emphasizes some common elements with the general definition of LPS.

First, AIR is defined as the study ‘of evolution and prospects of AIR, considered as a system, at the national, regional or local level’ and rural development is epitomized as ‘the process of change and modernisation of poor rural areas in which get involved peasant producers, rural entrepreneurs at the local and regional level, and the State, the so-called encompassing modernisation’ (Boucher and Riveros 1995). AIR is clearly viewed as a production system experiencing a process of rural development in which local and national enterprises and institutions must get involved.

Second the AIR definition bears reference to characteristics that can be found in LPS characterization.

- AIR regards ‘rural areas’, namely specific territories.
- It does not refer only to one activity but to a set of activities intertwined in commodity chains, agriculture, food-processing, but also service activities not specifically agricultural.
- A set of institutions and firms is involved in its development process.

Third, besides the issue of supporting the development of AIR conveys the issue of the improvement of the technology, namely of a technological change drawing on the technological heritage specific to these activities. The question of ‘AIR’ is therefore related to the localized dimension of innovation processes.

Our case studies show, beyond the clustering of units, the relative complexity and diversity of the functions performed by these units: variety of the production and of the activities with which AIR develops backward and forward linkages, backward ones with peasant agriculture, as well as with producers of inputs and machinery and tools, forward ones with packaging, transport and commercialization.

For example in the case of panela:

- As far as backward linkages are concerned, in the area of western Cundinamarca (Colombia), in the town of Villeta a family firm has made cane mills for over 50 years. In Barbosa manufacturers of hornillas sell to producers new equipment with the specifications and norms set up by
CIMPA, the research public entity in charge of upgrading the production process.

- As far as variety is concerned, new conditionings have emerged such as granulated *panela* or tablets. In Barbosa-Velez the manufacturing of bocadillo with *panela* and guayava can also be considered as a part of the *panela* system.

Similarly the cheese-processing LAS of Cajamarca (Peru) displays a relative complexity.

1. As regards backward linkages, it rests on a huge dairy production throughout the region: more than 160,000 metric tons in 1998, a steady rise since the beginning of the 1990s, which makes the department the second producer in Peru. Most of the production is concentrated in the provinces of Bambamarca, Celendin, San Marcos and Turgud, in the southern part of the department around the city of Cajamarca. Although 40% of the production is bought by INCALAC, a milk-processing facility subsidiary of Nestle, around 30% of the production is devoted to the production of processed products such as cheese.

2. The variety of products encompasses *quesillo* (curds), which is processed in *queso mantecoso*, a traditional oily butterlike cheese, and *queso tipo suizo*, a more standardized hard cheese. The producers of *quesillo* are located in rural areas and dairy basins around Cajamarca but 80% of the producers of *queso mantecoso* are located in Cajamarca. The producers of *queso tipo suizo* are scattered in the various dairy basins but their production is often marketed through a group of around 80 shops, clustered in two or three streets of the city of Cajamarca (Benavides Zúñiga 1999).

3. As far as forward linkages are concerned traders collect *quesillo* on the rural markets or supply cheese to the external markets of the coastal cities (Trujillo and Lima). Specific relationships between cheese producers and shops located in the city of Cajamarca involve primarily units that seek to achieve a quality level and a commercial image of their product.

In Gloria (Sergipe) there exist a complex cluster, consisting not only of over 60 *fabriquetas* (cheese-producing small plants), processing the milk bought from cattle-breeders, but also of over 20 road carriers, specialized in cheese transport, and various input and equipment suppliers (ferments, molds, etc.): a manufacturer of recipients for water-boiling has been able to adapt to the specific needs of the *fabriquetas* and to act as an assessor for their implementation. Various traders specialize in the commercialization of one or the other variety of cheese produced in the cluster. The number of products have expanded, from original ‘*queijo de coalho*’ (fresh cheese) to new varieties such as ‘*precozido*’ (with a thermic treatment by hot water) and ‘*mussarella*’ (or mozzarella).

This complexity of LAS is enhanced by the part played by interface structures, technology transfer centres, governmental (SENATI in Cajamarca, which popularize an array of dairy and cheese technologies, CIMPA, a technology transfer centre with CORPOICA, which has diffused and improved *hornilla* for *panela* processing), non-governmental (ITDG in Cajamarca, which set up a steering committee networking economic actors in the Jequetepeque). Given this complexity, specific assets can be
identified based on the characteristics of the production system and the interactions between actors.

Natural and climatic features of a specific area pre-select the types of crops that can be cultivated. For this reason LAS specialization might be determined, more than for non-food Local Production Systems, by agricultural or natural resources that can be considered to be generic. Nevertheless some of these natural resources may have a strong specific character, such as for example the quality of pasture in the Andes, due to climate and altitude.

LAS specialization stems typically from the existence of specific know-how and technology, when a specific transformation process of a particular product emerges in a given area, shared as a common knowledge by the actors of the area: it is a cognitive specific asset: in *panela* areas in Colombia and Peru, in *rallanderías* or cheese areas, the actors often stress the fact that in these areas ‘everybody’ knows the technology.\textsuperscript{14}

The existence of know-how as a specific asset can be seen in the case of cheese processing in Cajamarca and Gloria and of the production of *panela* in Barbosa. In Cajamarca skills regarding the processing of *quesillo* and *queso mantecoso* can be considered as secular, dating back to the development of cattle-raising at the end of the nineteenth century. In order not to lose the milk by lack of conservation facilities women used to make *quesillo*. *Quesillo* was then processed into *queso mantecoso* for family consumption and for the local market. *Queso mantecoso* appears therefore to be a specific product of this Andine area, where the producers of quesillo, given their isolation, have to process their milk into *quesillo*, to keep *quesillo* for a week, before they can sell it to producers of *queso mantecoso*. On the contrary, the manufacturing of *queso andino* ‘tipo suizo’ is quite new. It was introduced in the 1970s along with a project carried out by a Swiss NGO. Eventually the project failed and the facility closed but the skill had been transferred to the workers, who diffused it to other producers. A similar move can be identified in Gloria. Some producers are former employees of an industrial dairy facility, Betànía. The facility was bought by Parmalat and eventually closed. As far as *panela* production is concerned, know-how is mastered by teams of workers who rent *trapiches* on a benefit-sharing basis.

Specific assets are also built-in in this kind of relationship which exists between LAS actors, given the fact that they share the same historical experience and local identity of the relevant territory.\textsuperscript{15} Local social capital is paramount in this process: for example the association of producers of cheese in Gloria is headed by the nephew of one of the most eminent farmers in the area, but he is also a former employee of the parmalat facility.\textsuperscript{16}

These specific assets are not of a different kind to those spotted in industrial LPS. However, food production clusters can display a specific asset of their own, drawing on the product-specific relationship between the consumer and what he or she actually consumes. In the case of food, proximity with the product stems both from its biological function, which entails a process of ‘incorporation’ (Fischler 1993) of the product, and its symbolic character, which is often magnified by this process, and is therefore more crucial than in other activities. The local dimension of markets and technology end up vindicated by this factor in as much as the territorial origin of the product is a sign of its organoleptic quality and its symbolic value. Consumer/consumption proximity has an impact on quality assessment by the consumer, because of its cognitive dimension: in some cases the consumer knows at least partially the production process of the product, either by personal experience or by experience of
others whose competence on this matter is validated, which allows him or her to assess its quality. The carrying out of food preparation in the household as well as links that consumers retain, at least at the symbolic level, with food cultural and regional features are elements of this knowledge. This is particularly important for the setting up of guarantees of origin or processing of the product. This link has been stressed for developed countries by literature on product typicality and social construction of food quality (Sylvander 1992, Allaire and Sylvander 1997). The analysis can be extended to developing countries (Bricas and Cheyns 1995, Cheyns 1998, Requier-Desjardins 2000).17

The set of relationships between producers, processors, traders and consumers, regarding the social building of quality, linked to the territorial origin of the product which obtains in food commodity chains of typical products, is a specific asset built jointly by the entire commodity chain, from agricultural production to marketing (Bianchi 2001). Furthermore the quality characteristics of agricultural production may involve in some cases the environmental management of rural areas or landscapes and so the performing of an array of rural activities (including, for example, ecotourism, craft production and so on) as stressed by Lacroix et al. (1998). If typicity is not a general characteristic of LAS products, some do display this status: so are for example, among the case studies under review, panela, a typical product of the Colombian diet, and queso mantecoso, which is manufactured only in the Cajamarca area.

Given this feature, LAS appear as embedded in a double network:

- at the horizontal ‘territorial’ level with a set of agricultural or non-agricultural rural activities, local institutions, local know-how, etc.
- at the vertical level, down the commodity chain, with commercialization, conditioning, marketing and consumption.

These two sets of relationships are not independent, when it comes to quality and typicity of products, inasmuch as quality is often based on features not only of the agricultural production process but also on cultural or environmental features of the rural territory.

Figure 1 illustrates this scheme of orthogonal relationships at the territory level and along the commodity chain, in which LAS are embedded. Horizontally the elements of LAS are connected with other rural activities, agricultural or not, because they share the same territory. In particular LAS rely on a set of local institutions. The territory can also be specified by its level and quality and the current state of natural capital and social capital. Vertically LAS are linked to the commodity chain, which extends as far as the consumer’s level.

Product quality will be recognized by consumers, whenever they can relate the quality to a territorial origin, which can itself be linked to a special quality of resource management, a specific fabric of social networks, local institutions and/or specific know-hows. The sloped arrow illustrates this direct relationship, which is at stake in quality building.

4. From agglomeration externalities to collective action: the integration to food commodity chains

According to Meyer-Stamer (1998), even if passive agglomeration externalities can be found in all clusters even the less dynamic, collective action discriminates between the
stagnant ones and the progressive ones. On the other part the progressive character of clusters relates to the way they are integrated to the commodity chains. Hence the tentative typology of industrial clusters in Latin America.

If we lack enough elements to build a similar technology regarding LAS, at least we can sort out the existence of passive externalities and collective action in relation to their integration to food commodity chains.

If we refer to our sample, ‘passive’ agglomeration externalities can be clearly identified in LAS.

(1) The concentration of producers allows for the existence of input and equipment suppliers as well as the existence of specialized traders and carriers: this can be seen in Gloria where a supplier of equipment has thrived by supplying ovens and receptacles for hot water, and where there exist a cluster of traders and carriers specialized in cheese; this can also be seen in panela-producing areas in Colombia, where traders can operate on the basis of the concentration of production.

(2) There exist wholesale markets where producers, middlemen, carriers, input suppliers can meet, which facilitates transactions and allows for the availability of specific inputs and products: such are the fairs and marketplaces in Chanta Alta and Bambamarca in the Cajamarca region, which concentrate the production of quesillo to be bought by traders supplying the production

The components of LAS are underlined in grey.

Figure 1. The local agri-food systems within rural territories and vertical commodity chains.
units of *queso mantecoso*, the *panela* market in Villeta (Colombia) where traders supplying Bogota and producers meet, or the market for Gloria cheese in Sergipe.

These passive agglomeration externalities can contribute to the building up of specific assets such as diffusion of relevant information or visibility of the product. However these passive externalities turn out to be irrelevant to secure the quality of the products: for example in Chanta Alta the lack of trust between producers and traders, coming from two different cultural environments, entails a typical ‘market for lemons’ situation (Akerlof 1970), where poor quality *quesillo* is more likely to be traded than high quality one.18

Specific assets resting on the network of relations between actors can also allow for the setting up of institutions that enhance the common interests of LAS producers. This element of collective action is likely to set up a criterion between stagnating LAS resting on ‘passive’ agglomeration externalities and dynamic LAS. Producer associations have effectively emerged in two relevant cases that we have studied: in Gloria (Sergipe) and Cajamarca (Peru). In Barbosa it is more the action of CIMPA, the interface structure with CORPOICA, the national agricultural research centre, which has diffused the upgraded *hornilla* system, which seems to have played a decisive role in shaping collective action. In the case of LAS collective action can particularly focus on the management of the specific consumer-product relationship that governs the assessment of quality: for example, the APDL (*Asociación de Productores de Derivados Lacteos*) of Cajamarca is trying to promote a trademark for the cheese of Cajamarca; similarly CIMPA is promoting new packaging and conditions for panela, tracing back the product and also supporting efforts made by some producers towards the certification of organic *panela* for exportation.

This kind of collective action on quality must, however, as Bianchi (2001) showed in the case of Southern Italy, be carried out jointly not only by food processing and marketing units but also by agricultural producers, all these actors producing and managing common assets (or ‘club goods’) such as quality labels for example. This is particularly clear in the case of Cajamarca *queso mantecoso* whose quality can be hampered by the poor quality of *quesillo*, but also in the case of organic *panela* which entails not only the implementation of CIMPA-supported innovation in *hornillas* but also an organic agricultural process without agrochemicals, currently only developed in some areas (Western Cundinamarca more than the Rio Suarez valley).

The capacity of LAS to be integrated in a global food commodity chain will no doubt be a crucial element of their resilience and of their contribution to development. From that point of view the situation is contrasted. Most of the LAS we have spotted throughout Latin America are not really part of global commodity chains, in some cases because they process products that are typical of national food habits, such as *panela*, in others because their activity looks marginal in a sector controlled by transnational firms: so are the various cheese-producing LAS, which often process the milk that has not been collected by TNC (such as in Cajamarca). But these LAS, at least the largest ones, enjoy a national market with a territorial image of the product they market, and they are developing collective action in order to improve their presence in the market. In some cases they are even considering exportation.

By example, the empirical importance of quality guarantees of Cajamarca cheese is secured by the existence of short distribution circuits, proximity between commercialization and production, and a special packaging. Conversely Cajamarca is known
throughout the country, and especially on the huge urban markets of Lima or Trujillo, as a cheese-producing area. Similarly, if the commercialization of panela is currently thwarted by the want of tracking-back the product, thanks to market control by a few middlemen, this preoccupation does appear in the search for new markets and new conditioning: new presentations in cubes or powder, targeting high income consumers, do often bear the mention of a territorial origin. There exist some tentative exports of panela, as an organic product, to the European Union, with certification of the product at the different stages of the production process. There is also a steady stream of exportation towards Colombian and Latino diaspora living in the USA. Even in the case of Gloria, it seems that the territorial origin of the product is acknowledged by consumers outside the area, in Aracaju, capital of the state, or even in Salvador de Bahia or Recife.

A typology of LASs according to their capacity to evolve and develop should be designed somewhat differently to the one proposed by Altenburg and Meyer-Stamer (1999), basically because food commodity chains are not only buyer driven but also at least partly ‘consumer’ driven’, whenever the cognitive assessment of the quality of the product by the consumer plays a role. One of the main specific assets enjoyed by LAS, and moreover one that can be enhanced by collective action, is the cognitive proximity with the consumer. The collective action of promotion of the product, linked to a process of labelling and certification could be a criterion for dynamic LASs.

Moreover the ability of LAS units to diversify and specialize is a condition of their evolution towards more complex and efficient forms. Dynamic LAS can evolve: even if AIR systems consist of clusters of small food-processing units, we cannot exclude the likelihood of a LAS mustering small units as well as larger ones, belonging to ‘traditional’ agribusiness (meaning capitalist firms). We cannot all the same exclude that, within a LAS consisting exclusively of ‘AIR’ units, these units can differ widely in their size, their entrepreneurship, and display consequent income disparities and hierarchical relations, as in the ‘cluster’ model studied by Schmitz (1995).

5. Some concluding remarks

All in all it seems worthwhile and relevant to discuss the existence of Local Agri-food Systems in Latin American countries as a special type of Local Production System. Some issues nevertheless have not been mentioned, and the authors would like to briefly give an account of these issues.

First, the examples reviewed as well as others alluded to need some more empirical studies and data collection. Some of these studies are currently under way.

Second, at the analytical level, since LASs are Local Production Systems, the paths leading to the building of identification indexes of LAS should be explored as from now as they have been explored for the industrial LPSs, especially with regard to the following points.

- Given the importance of institutions in the building of LPS, a measure of the institutional density of territories in which they develop, through an exhaustive census of institutions, should be carried out. It cannot only bear on public or private, formal or informal institutions, directly related to the production process, but it must address thoroughly the whole set of institutions networking the actors of the system (such as cultural, athletic or religious associations).
Indexes, which measure ‘the small, the close, the intense’, to quote Pecqueur (1993) could be devised: ‘small’ and ‘close’ could be measured drawing on the census of production units, and on their localization (size cross-section and geographical density among others). Speaking of ‘intense’, its measure would rely on the identification of relationships between actors. This can be done using surveys on production processes and associated routines (the lending of machinery and tools, cross-subcontracting). The measure of institutional density could help it, since it could lead to an assessment of ‘social capital’ some authors have carried out in the analysis or rural dynamics in developing countries.

Third, the specificity of LAS within the array of LPS should be emphasized, not only for the sake of typology building, but also because it is related to the evolution of food and agricultural commodity chains and to the way these local systems can be integrated in these chains. In the case of LAS the integration to commodity chains must be assessed in the light of the backward linkage with agriculture, which can perform, besides strict food production, other productive functions regarding a set of public or common goods, defined at the territorial level, especially environmental ones. Their link to agriculture can make them producers of local public goods associated with the multifunctionality of agriculture. The identification of strongly typical products of rural food-processing activities with a production process drawing heavily on local tacit knowledge and know-how, even if LAS are not typical of their products, is an example of that. Consequently, this should affect the way they are integrated in food commodity chains.

From this perspective LASs are not only another type of cluster or LPS: their vertical integration to food commodity chains must be addressed not only by reference to their link with agriculture but also to their ‘horizontal’ integration in a local system strongly related to the management of some natural and cultural resources. This provides a strong rationale for the continuation of research on this topic.

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Notes

1. Mexico, with the emergence in the northern part of the country of the ‘maquiladora industry’, is a good example of that trend.
2. Although Porter (1990) tends to put food products among the ‘multi-domestic’ industries in which competition in each nation is essentially independent from the others, these trends can also be noticed for agribusiness (Rastoin and Vissac-Charles 1999).
3. The terminology is borrowed from Marshall who identified sector clusters in the manufacturing cities of early twentieth century Great Britain.
4. The seminal paper is by Beccatini (1979). Among Italians taking part in this debate are Garofoli, Bagnasco, Capecchi, etc. In France the main contenders are Claude Courlet, Bernard Pecqueur, Gabriel Colletis, etc. In the UK, this stream of research is particularly developed by scholars of the IDS (Nadvi, Schmitz, etc.).

5. The seminal work is by Nelson and Winter (1982). On the distinction between tacit knowledge and codified knowledge see, for example, Lazaric (1996). It must also be stressed that the part played by inter-actor co-operation, typical of industrial districts, is in line with the existence, in reference to the evolutionary theory of technological change, of increasing returns of adoption of new technologies and the necessity of the sharing of the sunk costs generated by the uncertainty attached to the future results of an innovative activity.

6. Innovative activities, specific to some branches, could concentrate in ‘technological districts’ where external economies enhance the acceleration of technological change. The typical example is Silicon Valley but others can be spotted from the suburbs of Turin to Bangalore in India.

7. According to Pecqueur (1993), all local economic actors benefit from these assets, in various degrees: these assets are to be found in specific territores, entailing specific development processes, but territoriality exists even in the absence of a registered territorial development process.

8. It seems that there existed a broad array of Local Production Systems, some featuring large firms with networks of sub-contractors. Even in ‘old’ industrial districts new patterns emerge, involving multinational firms: Capecchi (1992) shows the entry of external firms in Emilian districts during the 1990s. These evolutions have downplayed the vision of districts as a global alternative to ‘Fordist’ giant firms.

9. Hence the more low-key term of clusters proposed by Schmitz (1995).

10. In Latin America the development of a rural peasant food processing sector (Agro-Industria Rural) has been promoted over two decades by international organizations such as IICA (Inter-American Institute for Co-operation in Agriculture), notably with PRODAR (Programa de desarrollo de Agro-Industria rural).

11. This paper relies on material gathered while participating in reaching out missions made for the CIRAD/TERA in 1997 and 1999 in the cheese production area in Cajamarca (Peru) and Sergipe (Brazil) as well as field visits made in 1997 and 1999 in panela-producing areas in Colombia in the framework of a joint Franco-Colombian programme ECOS/CFES/COLCIENCIAS/ICETEX (no. 97PCF07) between C3ED (France), CIRAD (France), CORPOICA (Colombia) and UNIANDES (Colombia): ‘Evaluation environnementale de l’agro-industrie de la panela en colombie: une mesure de son impact et des effets des innovations technologiques’. More generally it draws on networking in the framework of the ‘GIS’ SYAL, which associate various French research institutions working on this topic.

12. This clustering of panela production is not restricted to Colombia: in Peru the upper Jequetepeque Valley there exist a cluster of trapiches producing the Peruvian equivalent of panela, chancaca.

13. The density of this clustering can be great: in the area of Cajamarca, not to speak of the 126 shops in the city, there are 5000 producers of quesillo going to Chanta market every week, 2500 in Yanacancha and 3000 in Bambamarca; moreover in this last basin there are 20 production units of mantecoso and 80 production units of queso andino.

14. Panela is interesting in this respect: processing know-how and skills are mainly tacit knowledge (selection of ‘panela point’ in the evaporation process or handling of the furnaces for example); they are collectively possessed by teams of piece-workers collectively contracted. It is therefore transferred within these teams, by way of a sort of career promotion of the workers through the duration of their lives, from low-skill to high-skill functions (D’Hauld 1994).

15. Machado Cartagena (1997) reckons that there exist specific transaction costs between small farmers and ‘traditional’ agribusiness, given the uneasy transfer of data and information between two kinds of actor geographically aloof, as well as culturally. The linkage between agriculture and ‘AIR’ does not entail this cost, since it takes place within the peasant society.

16. The presence of leaders impelling the economic development of the area can also constitute a specific asset. The development of mango culture in the valley of a Jequetepeque tributary, in the department of Cajamarca (Peru) is an example of that, since it was pushed forward by a leader drawing on his specific long-built relationship with his geographical and social environment.

17. Proximity can lower the degree of perceived uncertainty by consumers regarding health and environmental hazards linked to the processing of the products.

18. This vindicates Bianchi (2001) when he stresses that the food-processing clusters that develop collective action are often those that have developed strong proximity linkages with agricultural production.

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