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Local institutions and territorial competitiveness in the case of Parmigiano Reggiano localised production system

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Summary

Aim of this work is to define the characteristics and actions of local institutions in promoting the competitiveness of regions specialized in agricultural food production. . The article considers these areas as localized production systems and focuses on the role of local institutions in managing food chains, local resources affecting the sustainability of local production system, the reputation of the area and the competitiveness of the entire system. It analyzes the example of the province of Parma and the production of Parmigiano Reggiano cheese focusing on the system of relationships that different local institutions have developed and the effectiveness of governance generated by the Consortium of Parmigiano Reggiano with reference to sector level competition

Keywords: SYAL, REPUTATION, QUALITY, LOCAL INSTITUTION, SUSTAINABILITY

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1. CHAPTER 1 – AGRI-FOOD AND TERRITORIES: CONCEPTS AND IMPLICATIONS

Competition among firms in the agri-food sector is often considered as very important compared to the relationships between firms along the supply chain and firms on the marketplace. In this view, the role of the territory is less important for the objective of developing an efficient global value chain (Fisher 2012, Fischer and Hartman 2010). On the other hand, territory can contribute in many aspects to increasing the level of competitiveness of firms belonging to the same territory and following different objectives in the same economic sector (Sforzi and Mancini 2012).

The scientific debate around the role of the territory in terms of contribution to enhancing the level of competitiveness of the whole territory considers Industrial Districts (ID) to be the most efficient form. IDs are recognized by the international scientific community as a model of production which help small and medium enterprises (SMEs) to attain the same level of competitiveness as large firms. ID is a model of economic growth and social development (Sforzi and Mancini 2012).

The Industrial District concept has also informed similar concepts such as the *systèmes productifs localisés* (Localised Production Systems) (Courlet 2008), and hinted at a “*territorial dimension*” of concepts such as the cluster (Porter 1990; Porter and Ketels 2009). These approaches have the common characteristic of considering the proximity of the actors involved in the local production system as a valuable asset. The concept has recently brought to development economics the opportunity to interpret economic change through places where it actually is formed, as a result of joining action of local and extra-local social, economic and institutional forces.

Considering an Industrial District as a geographical concentration of industry is not only a way of interpreting it through the theoretical framework of the location of industries. It also reflects a concentration of factors (economic, social, geographical and environmental) that characterize the behaviour of a local community specialized in an industry as well as an industry concentrated in a place (Sforzi and Mancini). The main connotation of the concept of industrial district is the close link with the territory in all its dimensions. ID considers not only the characteristics of SMEs but also the role played by all the typologies of territorial actors (economic and social), their institutions and the local environment characteristics.

The concept of industrial district is functional to actions devoted to promote local development action acting on three different axes (Porter and Ketels 2009): i) Endogeneity, when potential (material and immaterial) resources exist that can be used and valorised through the creation of a cognitive environment; ii) Territoriality: when actors create a space for actions characterized by relationships that are more intensive, constructive and effective compared to relationships developed outside this space; iii)

Institutionalism: where Institutions contribute to the creation of system of values that generates positive impacts on relationships of stakeholders in the system.

The result of the interaction of these axes generates the conditions for development of specific policy supporting the local development process. These policies cover different areas but the common results are the following (Sforzi, 2003):

- exploitation of local resources;
- increased specialization and diversification of production;
- promotion and attraction of new businesses (entrepreneurship);
- promotion of cooperation and partnership between companies;
- organization of networks between public and private agents to increase the productivity of the local economy and to integrate and disseminate innovation, including by links between entrepreneurship and research centers with the aim of improving competitiveness.

Local development thus becomes a way of interpreting economic change of a community of people (citizens and entrepreneurs) involved in a process of cumulative knowledge where economic actors are specialized in the production of a certain class of goods (or services) that satisfy needs (or desires) of groups of consumers who are outside the local market. In this framework, a great contribution that institutions can make to development is through the production of specific public goods. These are often immaterial goods and act to improve the level of skills, to facilitate relationships among stakeholders, to reduce transaction costs, to increase the value of output by raising the profile of local products and the territory as a whole (Muchnik, 2010) reaching a better market efficiency.

1.1. The role of Rural District and Localized Agri-food systems

In the case of the agri-food sector the concept of Industrial District can take different forms depending on the role that the natural environment, agriculture and food industries have in the production process and in management of the whole system. Modern dynamics, are mainly the result of social, economic, cultural, technological, and institutional change. The way in which agri-food systems reorganises itself, meets consumer need and generates positive externalities and underlies spatial dynamics, is a cause rather than an effects of the evolution process.

Several different concepts accompany those of Industrial District and Local Development:

- *Rural Districts*: these have a dominant rural dimension and are characterized by environment and landscape, low level of population, low concentration of urban residential and productive settlements, significant incidence of protected areas, and the predominance of the agricultural production activities with respect to the environment (Belletti and Marescotti, 2010). The concept of the Rural District was introduced and has been interpreted as referring to the Maremma rural area, but it may be attributable to other Italian and foreign areas as a model of i) organization of the rural economy oriented to rural development quality, and ii) processing and management of operations of agricultural and rural policy (Belletti and Marescotti, 2007). The Rural District directly involves enterprises, institutions, other local actors and, in parallel, identifies forms of local governance (both vertical and horizontal) such that they can accompany the transition from model to model of modernization of rural development quality. In this logic new paths of local development based on the agricultural entrepreneurship, the multifunctionality of agriculture, the development of the area and all the activities in some way within the context of rurality are strengthened and fostered (Pacciani, 2003).

In Rural Districts too there are elements that characterize IDs, such as the following: the specialization of each step of the production process, production processes to some extent complementary and interrelated, availability of specific services in the territory, the presence of networks of relationships supported by a climate of trust that facilitates transactions between the business community and in the ease of movement of information, the availability of highly skilled human capital in the creation of a reputational capital outside the territory. The extension of the concept of district to "rural" thus entails taking into account a variety of economic activities present in a territory. These activities are diverse but highly integrated and interdependent, and competitiveness derives from their complementarities according to the logic of economies of scope. This conceptual articulation is to conceive of the territory in its entirety, not only as a place that "hosts" economic activities (albeit strongly linked to it, as in the case of agricultural activities), but as a support to a set of functions and complex type of social and environmental impacts which contribute not only businesses but also "non-business" (Belletti and Marescotti, 2007).

Rural Districts thus play an important role operating in upstream and downstream sectors of agriculture in the context of food chains, as well as in tourism and crafts, environmental resources and the archaeological, architectural, artistic and cultural features of the area deriving from the contribution of tradition and farming. This meaning of development also implies a transformation of the operators, businesses etc. taking part in the local paths of development. It implies sensitivity to product or service quality, and respect for the natural environment, the local culture and tradition, and thus sensitivity to the overall image of the area (Belletti and Marescotti, 2004). As a consequence rural policies have the specific aim of strengthening agriculture activities action on structure, production process, and market relationship without loss of the cultural dimension and local heritage. These today are in fact an important asset of the rural development process.

- *Localized Agri-food Systems (Systeme Agroalimentaire Localised) approach*: emerged in the mid 1990s and is, at first sight, close to the cluster, as it refers to geographical concentrations of specialized farms, food-processing units and distribution networks, private or public entities in a determined place. Nevertheless, Muchnik (2009) argues that: *"the territory of a SYAL is not a continuous space. It is one of belonging, in which a combination of different activities can be carried out in areas that are often physically far apart"*. Three distinctive features identify LAFS: i) place, ii) social relationships and iii) institutions. *"Place"* is intended in its widest meaning as used by the French school, that is *"terroir"*. It covers the specific nature of natural resources, the history and tradition of production and the presence of local know-how (De Sainte Maire et al. 1995; Sylvander 1995; Bérard and Marchenay 1995; Barjolle et al. 1998; Casabianca et al. 2005). Social relationships consist of trust, reciprocity and cooperation among actors; they are the *"glue"* of local action (Zambrano, 2010) and an endogenous development mechanism can arise from the interaction with place (Boucher 2007). The third feature, institutions, is intended as private and public agents who promote actions regulated by formal and informal rules. The new way of looking at agri-food cultures, together with social relationships and the intervention of institutions in the operation of local economic activities, led to the first conceptualization of SYAL: *"Production and service organizations (agricultural and agrifood production units, marketing, services and gastronomic enterprises, etc.) linked by their characteristics and operational ways to a specific place. The environment, products, people and their institutions, know-how, feeding behaviour and relationship networks combine within a territory to produce a type of agricultural and food organization in a given spatial scale"* (CIRAD-SAR 1996). In the words of Torres Salcido and Muchnik (2012): *"the specific nature of SYAL lies in the conjunction of food culture-human action-institutions"*. SYAL can be analyzed, as the result of a process of cooperation between companies with common interests located in an area that organize themselves and agree on norms and rules of production and marketing in order to obtain a competitive advantage over other collective agents. These

can be actual or potential competitors from within or outside the territory who may or may not be located in the territory, but who do not adhere to the norms and rules of the SYAL.

Initially, the production paradigm of LAFS was approached through the concept of clusters (Porter, 1990) which were thought to follow the condition of spatial proximity of the actors involved in the production model. But subsequently it was agreed that the specificity of the LAFS is due to spatial features of the products, people, institutions and social relations that create the links between food and territories. Researchers now consider more relevant the relationship between the LAFS and qualification processes of territorial products, in which collective action is aimed at obtaining recognition of origin. (Giacomini, 2013). In this regard, Muchnick (2009) identifies four fields of elements that define SYAL: qualification of products, coordination of stakeholders and collective action, resource management and dynamics of knowledge. Their interaction explains the diversity of existing agri-food systems, their emergence, stability and crises. In fact, SYAL is also a developing category (Torres Salcido and Muchnik 2012) which aims to capture and interpret rapid economic and social changes of local dynamics (Muchnik 2009). In this respect, Fournier (2002), Boucher (2004), Fournier et al. (2005), Fournier and Muchnik (2010) find that SYALs have a life cycle. Boucher (2007) defined SYALs as processes in construction, local places constructed by relationship with actors sharing interests linked to one or more rural agri-food sectors. Without collective processes of innovation, a SYAL is destined to disappear, as falling profits following the increase in the number of producers generate a shift of the actors to other activities (Fournier 2002). Building a long term reputation on the basis of a quality label can provide sustainability for some SYALs (Oyarzún 2005; Fournier 2008). To prevent dis-embedding forces from overcoming locally embedded forces, a specific course of action is necessary for individuals and communities (Mancini, 2013) seeking to create markets or institutions that will allow them to regain control over production and trade. Thorne (1996) defines this action as “re-embeddedness”. The SYAL approach can contribute to this debate in the analysis of the degree of coordination and interaction between place, social relationships and institutions.

Recently, the increasing importance of localization and delocalization processes has led researchers and policy-makers to use place as assembly factor for different territorial activities. This has led to a further methodological development in the concept of SYAL by which the organization surrounding a local resource moves from being purely agricultural to becoming multi-functional (Rodríguez-Borray and Requier-Desjardins 2006). A SYAL thus becomes a development model and is a powerful tool for the creation of a public agenda in policymaking.

It is clear that different criterion aimed to describe the characteristics of each LASF area/region are relevant and should be considered as a driving force both for the capacity to influence the characteristics of the system and to influence the evolution path in a competitive world. Those aspects can be present as:

- The presence of a territory with specific natural local resources, history, cultural heritage and skills
- The presence of important agricultural sectors.
- The presence of SMEs involved in agri-food sectors
- The presence of a large food industry
- The presence of social relationships
- The presence of Local Institutions
- The presence of a reputational asset both in the agricultural and industrial sector

1.2. LAFS and reputation

The interplay between LASF characteristics becomes important in the definition of the evolution process of the local system when the link between them is considered. The possible combinations define different models of local agri-food systems:

1. *Closed systems: local agricultural outputs are processed by local food industries only (mainly SMEs).* This LAFS model is characterized by the strong and unique link between agricultural phase and processing companies of the region. This link has great impact on product quality, firm structure, market strategies and environment relationships. As a consequence, management of the local environment is the most important aspect as it contributes to managing the quality of the inputs, acts on the possibility to guarantee a certain volume of production, guarantees the reproduction of natural resource and reinforces the image (and reputation) of the whole system. This is not enough because processing, when it is carried out by small SMEs, considers the link between agriculture and processing mediated by the presence of heritage, culture and skills. In this production model local resource characteristics become relevant. Local resources are not only fixed factors linked to the environmental characteristics (like land and water) but also to those aspects (like biodiversity, animal breeds, and local tradition) with high specific features linked with the history and the environmental condition the region. In other words, local resources have high specific features, in contrast with standardized resources that are “generic” and reproducible by definition (OECD 2008). They characterize the quality features of the outcome of processing and contribute to the definition of local food quality (Belletti et al, 2012).

Another element that is at the same time, a consequence and distinctive factor of the LAFS production model is reputation. This “*territorial reputation*” becomes an economic asset thanks to the characteristics of the local production system and the role of the consumption model of the local population. The definition of local food “*conceived as food with strong roots in a specific geographical place, which gives the product its identity*” (Belletti et others, 2012) shows the link between local consumers and local productions systems. Reputations play a relevant role in the process of product valorization and contribute to guaranteeing income from local resources. In a territorial approach, the process of local accumulation of capital generated by the management of local resources and the production of local food, is considered a condition to establish and activate the “*virtuous circle of typical product valorization*” and thus generate a socio-economic-environment suitable for sustainable local development process. The main implication of the adoption of the virtuous circle is the preservation of the agri-food system and related social networks, which contributes to economic, socio-cultural and environmental sustainability (Belletti e Marescotti, 2010; Vandecandelaere et al, 2010)¹.

Although “closed” LAFS deal only with local resources they might have relationships with consumers from other regions. Often the phases of the supply chains in a LAFS do not stop completely on the inside and, in spite of the level of cooperation existing between companies, there is hardly ever enough demand inside the LAFS to absorb output completely. So the LAFS needs to project into larger markets (Beccattini, 1989). Often, the higher the reputation, the further away are consumer markets. The result is the presence of food chains that can include different type of agents, where only some of them are operating within the region. At the same time the effectiveness of the food chain has big implications since they deal with individual and collective strategies including the relationship with the local environment. In turn the contribution of the local production process to sustainable development will depend on governance actions finalized to manage

¹ This can be consider an ideal-model of the process of production and reproduction of typical products in a logic of regional development boosting the economic development of the entire system and region.

local resources and interaction among stakeholders within the territory and the food chain (Reviron and Chapuiss, 2011).

2. *Open systems: agricultural outputs are not processed by local food industries or SMEs.* Although the link between agriculture and processing industries is weak because inputs come from others regions, there are important relations with the local production system. In the pure spirit of Industrial District, links with the territory are concretized through the labor force, cultural heritage and skills, research activities, logistic infrastructures and the network of other enterprises involved in the same food chain. These companies have their historical roots in the area and have developed efficient and effective marketing strategies toward global markets and global consumers. These companies have generated effective global food chains with a very effective management, of both production systems and consumer relationships. Often, these companies become multi-national enterprises with factories spread all over the world and head-quarters in the place of origin. The main advantage of keeping the core of decision process in the original area of production is the presence of of the ID. This gives benefits such as low transaction costs, bargaining power with local stakeholders and policy makers concerning the decision process relating the evolution of the company. There are also advantages in being able to differentiate agricultural inputs on the basis of quality features of products and market cost. For such companies, agricultural inputs are not a constraint and their strategy is to buy agricultural commodities with quality level adequate for processing at a lower cost.

In “*open*” LAFS models, local companies also have the advantage of benefiting from connections with local research systems, which allows them to innovate and follow new technological paths that raise the level of competitiveness. In order to enhance their level of competitiveness on the market they may also use aggressive marketing initiatives. Reputation, with the form of “*industrial reputation*” is reached by an intensive promotion of the company brand. This aspect is not trivial considering the fact that product quality is often associated with the features of the local environment, local cultural heritage and the name of the local area (or region).

3. *Mixed LAFS systems: Coexistence of close and open LAFS.* These systems are characterized by the coexistence of both models. The territory at the same time has specific natural characteristics and develops strategies that are typical of the Industrial Districts and Rural Districts. The results of this combination are the reinforcement of meanings of all the variables that characterize and influence the development process of local areas, including reputation. Reputation becomes an asset for all the firms involved in the food production system if it is associated with local products rooted in the area and with the name of the region (often recognized as GI products). In this case, the name of the region becomes a brand, not only for industries involved in the GI products but also for the entire food sector and for the local companies, and it carries a clear message of quality. An important effect linked to reputation is the economic growth of the territory due the presence of “*spillover effects*” (Mayer, 2006, Giacomini et al, 2010a). This phenomenon is considered as the action of the overall growth of an industry as a result of the presence of a stock of intangible capital developed within an area (the district) because of the reputation achieved by goods particularly appreciated by consumers. The spillover effect due to territory reputation is known as “*spillover reputation*”, and gives central place to the reputation of the actors and their governance in the management of the development process or crisis situations (Mayer, 2006; Yu and Lester, 2008).

The simultaneous presence in the district of spillover effects, attributable to the geographical condition, and reputation can lead to important consequences on management and strategic analysis of all firms as well as those involved in the production of local products. A fall in territory reputation might occur when some companies take advantages from the reputation and adopt unfair behavior against other companies in the

same region (Rossi and Rovai, 1999; Yu and Lester, 2008). This phenomenon is often under-estimated and can lead to failure both for the reputation and for market competitiveness. The reputation asset for local products should be conceived as a local qualification process. It is in fact a social construction by which local actors (producers and other stakeholders) manage the link between product quality and its territory, and reach a dynamic agreement on the way of linking the product to society (consumers and, more in general, citizens) on the basis of certain conventional rules (Belletti et al, 2012; De Sainte Marie and Casabianca 1995;). At the same time, reputation, especially in mixed LAFS, might lead to failure if stakeholders do not consider properly the adoption of specific policies aimed to preserve the “virtuous circle ” (Belletti and Marescotti 2010, Vandercandelaire et al 2010).

In order to preserve the “*virtuous circle* ”, Belletti and Marescotti (2012) consider three different areas of action: Technology, Collective actions and Market failures. The management of these three dimensions can reduce conflicts and affect the balance of power between actors. It thus helps the qualification process and prevents under-payment of local resources. It acts at the level of both the consumer market (reducing asymmetric information) and the intermediate market (reducing imperfect competition that generates unfair value distribution between firms in the supply chain). In conclusion, the development of local products through the activation and the capitalization of tangible and intangible assets, may allow the remuneration and therefore the reproduction of specific local resources by encouraging the preservation of the territorial system in the dynamics of social, economic and environmental factors. By contrast, the inappropriate remuneration of local resources (especially labor), acts on the reproduction of the product, which shows fewer identifying characteristics, and on the positive economic, social and environmental effects.

1.3. LAFS and Local Institutions

The literature shows that in closed, open or mixed LAFS, organization can be considered as a potentially positive element. This behaviour is fueled by a sense of belonging and commonality of interests and represented by governance actions. It is the result of interaction with each other participating companies (or actors) and creates the dynamic forces that allows the LAFS to adapt its organization to the challenges of the markets (Giacomini 2013, Rallet et al., 2004; Torre, 2000).

Giacomini (2013) observes that the organizational proximity is central to the process of coordination of the actors of the system, which can have local boundaries, but can go even further. The problem is to determine to what extent the limitations of geographical proximity can be overcome without jeopardizing the values on which the organization is based: a sense of belonging and common interests of the agents of the system (Rallet, 2002).

In this environment, collective action aimed at strengthening reputation and the “virtuous circle ” is determining for the preservation of the local agricultural system and the development of the chains belonging the territory (Vandercandelaere et al, 2010). On the other hand the area of the collective action is within and outside the region and involves, by definition, many different actors. Producers, processors, traders and consumers share know-how about good practices regarding production, processing, preservation and trading ,and use and consumption of market recognition obtained by local products reflects the collective capacity to define and efficiently manage the combination of natural and human factors. In this view, collective rules and governance actions should not be considered as a constraint but rather a condition for efficiency for the local products and the entire local system (Vandercandelaere et al, 2010).

In this framework, the local institution represents a group of stakeholders that play key roles in the process of increasing territorial competitiveness. Their role is mainly to strengthen relationships among stakeholders with the general aim of obtaining the production of those public goods and creating positive externalities which most serve the process of development and thus increase the level of competitiveness of the entire local system.

In this light, local institutions can be considered as “*all those Institution that represent at local level groups of interest in the economic, social and political pattern*” (Vandecandelaere et al, 2010). They represent groups of stakeholders in the constant debate about the evolution of local systems and in the attempt to modify/introduce trajectories useful to the need of all the component of local society. Their main contribution to local development is to express governance strategies (at chain and territorial level) that reflect the interest of the stakeholders. In other words their role is to contribute to increasing wellbeing by managing a territory’s tangible and intangible resources. This means managing, directing and coordinating socioeconomic processes in a specific environmental context, with local institutions and social actors (within and outside the territory) who articulate their collective action in terms of the value appropriation of territorial resources or the expectation of wellbeing generated by the valuing of those resources (Torres and Muchnik, 2012).

According to Torres and Muchnik (2012), within LAFS Local Institutions develop actions aimed at reaching agreements and managing the main issues related to the local development process in the various main dimensions: technical, institutional, social, market effectiveness, technological improvements, territorial valorisation, quality assurance and knowledge transfer (Table 1). For these reasons Local Institutions play a political and institutional role that considers local production systems as complex system relevant for the constitution and operation of the local enterprises. LAFS organisations not only obey self-regulating and self-managing organizations belonging to the administration of local resources but they involve also the interaction with the market and the National Governments and comply with European Laws (Giacomini, 2013). As already mentioned, they develop common rules in order to obtain a collective competitive advantage from which each one also benefits individually (Giacomini et al 2011a, Perrier-Cornet and Sylvander 2000, Torre 2000). In this model clearly there is a process of cooperation that involves several type of actors - some of them at local level and others out of the territory- that manage the whole systems through inter-branch bodies, which represent for the management of this systems the best response in terms of organisational structure (Giacomini et al 2011a, Giacomini 2013).

Table 1. Area of intervention of Local Institutions

Area of intervention	Objectives:
Institutional	<ul style="list-style-type: none"> - Establish relationships among territorial and extra-territorial institutions - Comply with national and international regulation
Social	<ul style="list-style-type: none"> - Favourite social inclusion - Favourite social cohesion
Market effectiveness	<ul style="list-style-type: none"> - Establish supply chain relationships - Avoid market failure - Reduce transaction costs - Promote the legal protection of collective names - Generate collective promotion and advertisement

Technological improvement	<ul style="list-style-type: none"> - Definition of code practices - Validation and introduction of new technological patterns - Respect of traditions and local heritage
Territorial valorisation	<ul style="list-style-type: none"> - Management and reproduction of local resources - Promote local marketing
Quality assurance	<ul style="list-style-type: none"> - Respect of the technological rules - Increase levels of trust in product specificity
Knowledge transfer	<ul style="list-style-type: none"> - Lower technological barriers - Maintain and spread professional skills

Key elements for the definition of inter-branch organizations according to Rio and Nefussi (2001) are: i) the presence of operators engaged in branch activities related to each other as part of a chain, ii) which deal with the same product (or a family of homogeneous products) within a defined territory (region or country), iii) that elaborate common strategies from a democratically expressed will and iv) benefiting, for this reason, from wide delegation of powers by the public authorities. Coronel and Liagre (2006) define the inter-branch organisation as a private organization, recognized by the State, which brings together the operators upstream and downstream from the same sector, with the aim of developing policy choices on negotiations and contracts, ensuring fair relations among members, allowing them to develop the performance of the supply chain and to defend its interests. According to Giacomini (2013) in the definition of Rio and Nefussi the most interesting element, which is absent in Coronel and Liagre's, is the reference to the territory as an essential factor for the establishment of an inter-branch organization. This "absence" comes from the size and bonds that link different actors in the supply chain, but the territorial nature is in fact necessary for the delegation of powers by the public authority. Public authorities transmit to non-members active in the same territory the contractual rules stipulated within the organization. It follows that the inter-organization, although recognized by the State, is an institution under private law, exercising, thanks to the extension granted to measures by the descendants inter-trade agreements, a regulatory authority having the force of public law (Giacomini, et al 2011a). Through inter-trade agreements - taking the form of collective agreements - decided by the different partners in the supply chain, the common strategy is defined and designed to regulate the conduct of participants in their business and the market to achieve inter-branch objectives (Coronel et al, 2006).

If, as Perrier-Cornet and Sylvander (2000) write, DOC chains can be analysed as a process of economic cooperation on a given territory between operators that organize and process of shared rules with a view to gaining collective competitive advantage, from which each benefits individually, it is understandable why in many successful LAFS stories the relevant supply chains often take the form of Inter-branch organizations. From the theoretical point of view, inter-branch organizations (Williamson, 1991; Perrier-Cornet and Sylvander (2000) are considered as hybrid organisational forms. It refers to "governance structures" which manage transactions, characterised by the availability of goods held by autonomous units, without leading to the unification of an integrated company (Menard, 1997). Those governance structures are based on cooperation among operators in the supply chain, defined by long-term contractual relationships which do not however affect their autonomy or respective rights of ownership. In hybrid forms, the relationships between the parts are regulated, or rather "governed" according to Williamson, by the principle of authority, transferring part of the decision-making powers to a third party institution. In the case of many traditional products linked to the territory and bearing designation markers, the "third party institution"

which is granted powers of governance, as Perrier-Cornet and Sylvander state, may be “*Groups*” (as defined by the Regulation 1151/2012²) such as Protected Consortium or inter-branch organisations.

The third party institution responsible for supply chain governance, whether an inter-branch organisation or, in the Italian case, a protection consortium, acts as a mediator among the operators in different phases with regard to the designated product, and also steers product quality through compliance with the production specification and/or by introducing payment systems into the inter-branch agreements which are based on the quality of raw materials. This type of third party organization also plays a key role in the definition of a “*strong territorial governance*”³ (Barjolles, Chappuis and Sylvander, 1998; Arfini et al. 2011) according to their capacity and objectives in organising the supply chain and establishing fair relations between members, increasing their ability to protect their interests against public administration and their competitors.

It is possible to argue that local institutions can be also organized as hybrid organisations since they represent the collective interests of individual producers involved in the same food chain within the same territory. In fact, according to the literature concerning the definition of collective action (Vandecastelaere et al, 2010; Reviron and Chappuis, 2011), production of local products involves the participation of different types of stakeholders operating within and outside the production area (Table 2), where only part of them are directly involved in the value creation process while part of them operate at local level. Indeed, setting up collective action by a local institution (the so called third party) includes different aspects: i) defining the community or group of stakeholders who will benefit from the right to establish the rules, and will share the rights and responsibilities to respect rules regarding the GI product; ii) establishing the network and the partnerships within the local production system, the territory and the external supportive actors, facilitating information and knowledge sharing; and; iii) defining the rules that will be shared by producers in the different phases. It is clear how collective action reflects the territorial management.

² Article 3 Reg. 1151/2013: ‘Group’ means any association, irrespective of its legal form, mainly composed of producers or processors working with the same product. Their role is defined in Art. 45 of the Regulation 1151/2013 and is to:

- (a) contribute to ensuring quality, reputation and authenticity of their products;
- (b) take action to ensure adequate legal protection of the protected designation of origin;
- (c) develop information and promotion activities aiming at communicating the value-adding attributes of the product to consumers;
- (d) develop activities related to ensuring compliance of a product with its specification;
- (e) take action to improve the performance of the scheme, including developing economic expertise, carrying out economic analyses, disseminating economic information on the scheme and providing advice to producers;
- (f) take measures to enhance the value of products and, where necessary, take steps to prevent or counter any measures which are, or risk being, detrimental to the image of those products.

³ Studying different PDO production chains, Barjolles, Chappuis and Sylvander (1998) propose four types of governance systems: pure sectoral governance, PDO sectoral governance, weak territorial governance and strong territorial governance. The first has poor relations with the demands for protection of a typical product, the second is based on informal agreements between the supply chain stakeholders and may also involve the alternative use of the raw materials; the two territorial governances on the other hand are based on the collective management of quality, production, promotion and research and development, in particular strong territorial governance which makes use of greater means of coordination.

Table 2. Stakeholders involved in the value creation process and territorial relationships

		Food Chain	
		Within	Outside
Territory	Within	<ul style="list-style-type: none"> • Producers • Processors • Local Consumers 	<ul style="list-style-type: none"> • Local Public authorities • Local Intermediate institutions • Research and extension • Other economic activities
	Outside	<ul style="list-style-type: none"> • Others Producers • Others processors • Distributors • Retailers • Consumers 	<ul style="list-style-type: none"> • Other Public authorities • Other institutions • Research Centers • Consumer associations

Source: Elaboration on Vandecandelaere et al, 2010

2. THE CASE OF THE PROVINCE OF PARMA AND THE PARMIGIANO REGGIANO CONSORTIUM

The Province of Parma is known worldwide as the capital of the Italian Food Valley. Its reputation comes from the long process of interplay between history, agriculture, food industries and local institutions that have boosted and managed the process of technical innovation and economic growth in the food sector (Arfini and Mora Zanetti, 1997; Giacomini et al, 2011b). It is matter of fact that nowadays agriculture and the agri-industry are the most representative economic sectors of the Province, and Parma, along with Milano and Verona is one of the areas with the highest concentration of agri-food industries in Italy (CCIAA Parma, 2013).

2.1. *The Parma province as Mixed LASF system*

Several factors make “*the Parma area*” unique. They include the coexistence in the same territory of a very active agricultural sector (it is considered one most productive areas in Italy), the production of Designated typical products known worldwide for their quality and reputation (3 PDO and 2 PGI: Parmigiano Reggiano, Prosciutto di Parma, Culatello di Zibello, Salame di Felino and Fungo di Borgotaro); the presence of big agri-food industries that cover the sectors of: tomato (50% of Italian tomato is processed in the area of Parma), sugar (in Parma one of the few factories in Italy that process sugar-beet is still present and active), pasta industry and baking (Barilla is the most important companies), dairy products (Parmalat is still one of the most important companies of the milk sector in Italy and word wide) and pork meat (with the presence of slaughterhouses that serve the companies involved in the salami sector). Of course those entire sectors are surrounded by companies able to deliver services and innovation. But this is not all. Parma is known worldwide for the presence of firms manufacturing equipment for the food sector, in which they provide cutting-edge technologies for processing, preservation, storage and logistic management of liquid and solid foods by food manufacturers.

Surrounding all these sectors as part of the Parma food systems, there are present and active different institutions that can be seen as third party organizations, which support both specific food chains and local development. A partial inventory of Institutions operating in the Parma province includes:

- GI products are represented by their respective Protection Consortia (Consorzio Formaggio Parmigiano Reggiano, Consorzio del Prosciutto di Parma, Consorzio del Culatello di Zibello, Consorzio del Salame di Felino, Consorzio del Fungo di Borgotaro);
- Tomato growers involved in the tomato sector are represented by three Producer Organizations. Together with tomato industries and the Administration of Parma, these have set up the Inter-branch organization “Parma Tomato District”;
- Eno-gastronomic routes. Their aim is local marketing and to promote tourism at local level: Strada del Culatello di Zibello, Strada del fungo di Borgotaro, Strada dei vini e dei colli di Parma;

In addition there are other institutions that characterize industrial districts including: Unions, Research centers specialized on food processing and preservation (SSICA), Public authority governing the food sectors (EFSA), Certification bodies; Intermediate Institutions (Chamber of Commerce, LEADER organization, the Trade Fair organization), other Public administration Institutions (including the “Comunità Montane” and Regional parks). All these companies are working in a fixed area (the Province) and they benefit from common objectives and common beliefs.

Relationships between these Institutions are facilitated by spatial proximity and personal knowledge of the members. The result of institutional inter-relationships can be well-defined in the process of cross-fertilization and lower transaction costs in several areas. These include the definition of development strategies for the supply chains, the application of Community rules on Rural Development, supply chain relationships, relationships with actors responsible for territorial marketing, the evolution of roles over time concerning the adaptation of codes of practice.

Other factors are associated with these important results. These include positive externalities that reinforce the image of quality for the all food products (material and immaterial) produced in the province of Parma. It is possible to argue that governance action of each Institution has the effect to increase both the reputation of producers and the reputation of the whole Parma Province.

So numerous elements allow us to consider the whole Province of Parma as a Local Food district, or rather a mixed LAFS. These are the link between material and immaterial goods, the presence of common objectives and strategies in issues like quality policies and environmental relationships and the objective of reaching low transaction costs and competitiveness for all the stakeholders involved in the province of Parma through the activation of local institutions. This includes real industrial districts (the case of Parma Ham) and food chains operating within the Parma area (Parmigiano Reggiano, Tomato sector). But the whole sector benefits from the possibility to consider the entire Province as a single area for industrial relations (including the management of the workforce), the overall reputation and competitiveness in domestic and international markets.

2.2. Parmigiano Reggiano: supply chain and protection consortia characteristics

The production system of Parmigiano Reggiano cheese is part of the Parma LAFS. It contributes significantly to the reputation of the LASF system and is “responsible” for different positive externalities linked to the presence of milk producers in mountain areas and the relationship with the natural ecosystem of rural areas. That’s why Parmigiano Reggiano is considered an important element in a potential “sustainable development system” defined by FAO (Vandecandelaere et Al, 2010, de Roest, 2000).

At the same time PDO Parmigiano Reggiano cheese may be considered a classic example of a supply chain created for reasons strictly linked to the production process. The actors are milk producers, dairy owners, wholesalers-agers and traders. The burden of the length of the financial cycle due to the maturing period has led to a clear division of tasks between milk producers, dairies and wholesaler-agers. At the same time, close integration has developed within the chain, both formally among farmers and the dairies and informally between dairies and wholesaler-agers⁴. This was demonstrated in research by de Roest (2004), which ascertained that, after one year of maturation, almost 50% of cheese, once branded, is sold to the same wholesaler-ager.

The supply chain of this famous PDO cheese groups farmers, dairies and wholesaler-agers, and is governed by a third party institution, the “*Consorzio del Formaggio Parmigiano Reggiano (CFPR)*”, which, as we will see further on, has the task of setting common rules for all members of the supply chain, and exercising control over and promotion of the product on the market.

The contractual agreements which govern the passage of the products (milk and cheese) between members of the supply chain must be analyzed according to their respective firm features, on which the business strategies are based. More precisely:

a) Farmers. This category comprises three different types: i) farmers who deliver milk to cooperative dairies they are members of; ii) farmers who sell their milk to non-cooperative (small-scale or industrial) dairies; iii) farmers who process the milk they produce in their own dairies.

The first category of farmers has chosen vertical integration by taking their milk to dairy-coops, counting on the high value of milk processing. The price of the milk however remains uncertain, as it is defined only at the end of the financial year and depends on the results of cheese sales linked to the quality of the forms, market trends and the sales skills of the dairy operators. These farmers also see their participation in the cooperative as a means of social as well as economic promotion (De Roest, 2000) and are therefore willing to play an administrative role in the life of the dairy as well as the protection consortium. The second category of farmers aims to shorten the financial cycle – the non-cooperative (small-scale or industrial) dairies pay for the milk on a monthly basis with advances based on specific agreements – counting on a pre-set price of the milk, even though this is often less than the price paid by cooperative dairies. These are generally large farms which have hired labor and greater recourse to external inputs, and are therefore forced to shorten the financial cycle in order to survive. The third category of farmers consists almost exclusively of large businesses which aim to achieve added value during the first two phases of the supply chain by processing the milk themselves, working directly on the market in order to choose the most favorable moment to sell and the most advantageous sales channel.

b) Dairies. In this case too there are three different types of dairy: i) farm-owned, ii) cooperative and iii) non-cooperative (small-scale or industrial). A common feature of all the Parmigiano Reggiano dairies is that they are single-product businesses, as the milk is destined exclusively for the production of this kind of cheese. It should be considered that the cooperative dairies are the main, if not the exclusive, source of income for the member farms⁵, and indeed the cooperative life cycle often coincides with that of the farm

⁴ The relations between farmer and dairy are governed by articles of association and specific regulations in the case of milk being delivered to a cooperative, or by sales contracts often running for years with the same small-scale or industrial dairy. Underlying the delivery agreement or sales contract, the farmer is bound by the rules of the PDO production specification, which also lays down the requirements concerning animal nutrition. Informal integration can on the other hand be used to describe the relations between the dairies and the wholesalers-agers, due to the very frequent habit of selling the cheese on to the wholesaler himself, repeated over time, which increases the wholesaler's authority in setting the price and the way in which relations are carried out with the integrated dairy.

⁵ Generally speaking, these are farms in which milk farming for Parmigiano Reggiano is the main if not the exclusive activity.

and the member farming families. For this reason the strategy of most cooperatives aims principally to protect the demands of the member families for liquidity. Many of the cooperative dairies in fact keep the cheeses in the maturing warehouses for as short a time as possible, selling their production to wholesaler-agers as soon as the product and market features allow. In this way, not only do they reduce technical and market risks, but they also reduce some management costs (including storage and maturation) and the dairies are in a position to pay their members for the delivered milk sooner. Most cooperatives therefore prefer to sell the product as soon as it has been branded (12 months) in batches⁶ to wholesalers, with whom consolidated and trustworthy relations have been developed, becoming stable sales partners (Arfini et al, 2006; De Roest, 2004). The wholesalers age the cheese for the second year, and then sell it on to other wholesalers or directly into the distribution channels.

c) Wholesaler-agers. Their function is decisive within the Parmigiano Reggiano supply chain, as they mature the cheese for the second and third year and define and develop sales strategies to place Parmigiano Reggiano within the distribution system. In other words, they set the cheese price with the distribution companies; develop strategies to handle competitors in the sector, and more than any other operator take advantage of the promotional brand campaigns run by the consortium.

One specific feature of the Parmigiano Reggiano supply chain is the “Protection Consortium”, responsible for quality control and product promotion, which could be considered, in a broad sense, an inter-branch organisation, given that the articles of association set out the participation of the milk producers, dairies and agers in the operations up to branding (12 months). But the Consorzio del Formaggio Parmigiano Reggiano cannot be considered as inter-branch organisation in the strict sense (Giacomini et al, 2011a).

The consortium has a very long history, and was founded on the initiative of its producers in 1934 as a voluntary protection consortium. Its role as protection consortium of Parmigiano Reggiano DOC was recognised in 1955 under the Decree of the President of the Republic which certified the “Designation of Origin” (DO) of Parmigiano Reggiano, and defined the “area of origin” and the quality standards. The same prerogatives were confirmed when Parmigiano Reggiano obtained recognition as a PDO product following the approval of EEC Reg. no. 2081/92⁷.

The Parmigiano Reggiano protection consortium differs from other consortia established following the application of Reg. (EEC) 2081/92, as its long history and experience allow it to assure the effective governance of the supply chain. More precisely, the articles of association allocate it the following tasks (Art. 4): *the protection of the designation of origin of “Parmigiano-Reggiano” cheese; monitoring of the production and sale of “Parmigiano-Reggiano” cheese; the valorisation of “Parmigiano-Reggiano” cheese production; the promotion, dissemination and knowledge of the Protected Designation of Origin and its relative reserved marks, aiming to generally protect the interests of such designation; the promotion of the consumption of “Parmigiano-Reggiano” cheese in Italy and abroad, as well as the development and support of any initiative of a commercial or other nature aiming to valorise “Parmigiano-Reggiano” cheese and increase its image and renown, including the participation in and establishment of consortial companies or*

⁶ Parmigiano Reggiano is usually sold in uniform four-month batches, as cheese produced in the periods January - April, May - August and September - December.

⁷ The most important difference with respect to the previous national legislation in the implementation of Article 10 of the Regulation is the allocation of the role of control activities carried out by an independent third body first appointed by and recognised by the Ministry of Agricultural Policies and Forestry and now under the supervision of the national authority for certification ACCREDIA. In the case of the CFPR therefore, the consortium is no longer in charge of controlling the compliance with the production specification in order to recognise the PDO and relative branding, but this role is performed by a third body called the “Quality Control Department”.

organisations. The CFPR had complied with Reg. 1151/2012 since 1992 according to Italian Law laying down the role for PDO and PGI protection consortia (Giacomini et al 2011a).

More recently, and before the Milk Package Regulation, protection consortia were permitted to present production plans, in the event of alterations to the standard market conditions, including a price reduction of at least 10% compared to the previous three year period, to restore balance. The CFPR obtained ministerial approval for the plan for the period 2006-2010 on 26th July 2006 and as yet the provision has served no purpose, as the amounts set as production limits have never been exceeded, although prices are constantly ?? just below the alarm level. Only recently in 2011, with the increase of production stimulated by the strong price increase, did production levels exceed the production limits set by the Consortium.

The clearest sign of the potential of the CFPR to develop policies which affect the parties in the supply chain are the adoption of three internal regulations⁸ and the possibility to take initiatives. These include participation in and establishment of companies operating on the market and the direct purchase of cheese by the CFPR destined for charity, institutional or promotional activities in order to facilitate the market penetration of Parmigiano Reggiano (Art. 6, Para. j).

In carrying out these functions, the CFPR can influence the strategies of companies throughout the supply chain, directly or indirectly affecting the quality of the milk⁹, the cheese¹⁰ and the markets it decides to intervene in with promotional activities or direct purchases. It should be underlined that the latter function, exercised for the first time in 2009 and 2010 makes the CFPR a market operator, and therefore a subject in the supply chain, and it thus risks losing its nature as a “hybrid organisational form” as identified by Perrier-Cornet and Sylvander (2000) as a party responsible for governance in a designated product supply chain (Giacomini et al 2011a). More recently the CFPR has obtained a modification of the production regulation with the objective of binding most of the product to the territory of origin. Regulations governing the diet of the cows and regulations governing the procedures for vacuum packaging of the cheese have both been modified with the aim of achieving this objective. Finally in 2010, the CFPR, to be more effective in the action of governance, amended its Articles of Association, introducing important changes that, without losing the democratic nature of decisions, change the criteria of representativeness which bind the government to the territory of the Consortium production (Giacomini et al 2010a).

2.3. Parmigiano Reggiano: The effectiveness of the CFPR action on the market and implications for rural development

As we have seen in analysing the purpose and functions of the CFPR, it is responsible for protecting the designation of origin (and its reputation) and monitoring the production and sale of Parmigiano Reggiano, and also for binding the production of cheese to the territory (from the environmental and economic point of view) and promoting it on the market. This function was further strengthened in the recent amendments to the Articles of Association.

Under the hypothesis that the Parmigiano Reggiano supply chain can be considered a “hybrid organisational form”, where the function of governance is delegated to a third party body - in this case the

⁸ The first defines cattle nutrition methods, the second the production standards and the third the cheese branding regulations

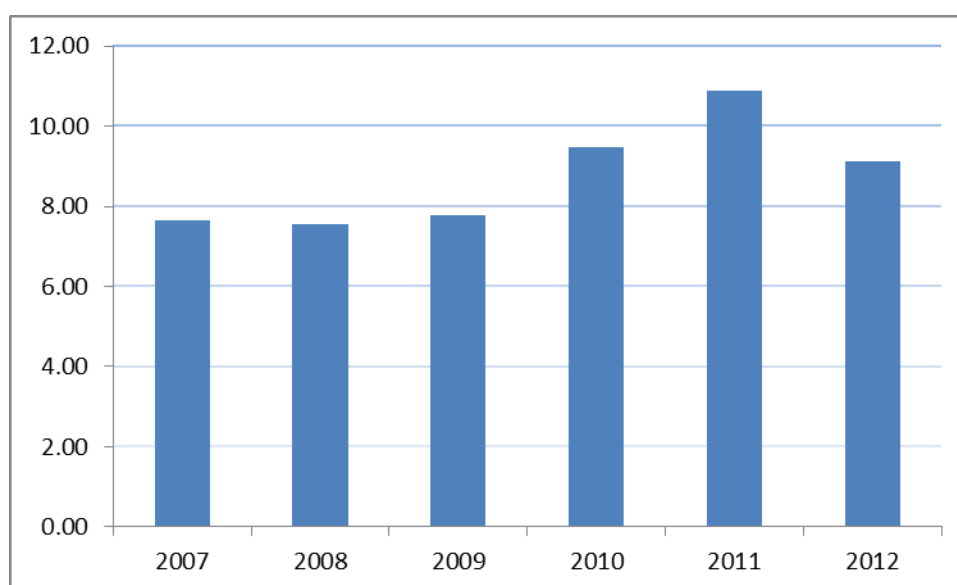
⁹ In this regard, the regulation on cattle feed sets rules for the farmers dictated by the protection of the dairy characteristics of the milk in respect of the environmental peculiarities of the production district. One example is the complete exclusion of silage, and the preferred use of alfalfa in the cows’ diet.

¹⁰ In this regard, the regulation is not limited to setting the characteristics of the cheese (colour, flavour, weight of the forms), but also the characteristics of the milk, how it is obtained (milking) and stored. These aspects on one hand affect the dairy characteristics and on the other require close ties with the production territory.

CFPR - it would be interesting to assess the effectiveness of its action in protecting the interests of the members of the supply chain towards competitors, a function which in fact should be carried out by an inter-branch organisation.

In a PDO supply chain, where all parties are linked in a territorial and economic dimension, the action of governance by a third party body (CFPR), protecting the interests of all parties in the chain, should affect, if somewhat indirectly, the composition and trends of milk, cheese prices and the relationship with local resources. Despite this, a time serial analysis of the trend of prices on the wholesale market of 12 month matured Parmigiano Reggiano cheese show that prices are sensitive to output quantity which is typical of a commodities market (Giacomini et al, 2011a). But this cheese, as a PDO product, should behave as a niche product, with a degree of price stability.

Graph 1 – Annual average price of 12 months Parmigiano Reggiano at dairy gate



Source: our elaboration on Si-PR data

Price instability (Graph 1) is also reflected on the production system, leading to a strong reorganization of the relationships between milk producers and dairy. Considering the data provided by the Province of Parma 2007 – 2012 on milk production and milk destination from each farmer¹¹, it is possible to describe the effects and the implications of new market scenario on the area of Parma. In detail, the analysis shows the evolution of the Parma LAFS during the period of economic crisis and allows an evaluation of the future competitiveness of the Parmigiano Reggiano system. Data are organized according the Local Labour System defined by ISTAT in the Province of Parma.

In milk production the most important findings are:

- Decreasing farm numbers: in total 214 milk producers have closed their activity, this is a decrease of 15.7 % of farms compared to 2007.
- Increasing milk production (in volume): despite the fall in the number of farmers, the system has experienced an increase of about 19,174 tons of milk (i.e. 3.2 % compared to 2007)

¹¹ Data are organized according the Local Labor System defined by ISTAT in the Province of Parma

- Increasing in average milk output per farm, as a consequence of the decrease in the number of farms and the increase in production volumes, the average milk production per farm has increased by 22 %, from 428 to 522 tons.

These three trends however, do not entirely reflect reality of the Province of Parma. Subdividing the province into Local Labour Systems, it is possible to identify which areas in particular have driven the change of the last 5 years.

LLS-Bedonia shows a decline in number of farms and in production volumes: in the period considered the LLS lost 5 farms (-36 %) and about 945 tons of milk, representing a decrease of 43 %. This phenomenon is significant considering that the total number of milk producers is already very low and there is a risk of milk production disappearing in this area. Less striking is the trend of the LLS-Borgo Val di Taro which also lost five farms but only 0.6 per cent in volume of milk production, amounting to an absolute decline of 48 tons of milk. The last three LLS: Fidenza, Parma and Langhirano are aligned with the overall trend. LLS-Fidenza shows a fall of eighty farmers (-18 %) but an increase in milk production of 4.2 per cent (amounting to 8,340 tons). LLS-Langhirano lost twenty-eight farms (fall of 11.3 %) and increased the volume of milk production by 1,856 tons (2.7 % more than in 2007/2008). LLS-Parma saw a decrease in milk producers of 214 units, (reduction of 15.2 %), but the volume of milk rose by 3.1 % (plus 9,969 tons compared to 2007 (Table 3).

Table 3. Evolution of the milk production systems by LLS. Each LLS corresponds to a different height above sea level

Number of milk producers by LLS	Total volume of milk production per LLS (in t.)		Average volume of milk production per farm (in t.)			
	2007	2012	2007	2012		
LLS-BEDONIA	14	9	2,205	1,262	157	140
LLS-BORGO VAL DI TARO	42	39	8,571	8,523	204	218
LLS-FIDENZA	463	380	197,656	205,995	426	542
LLS-LANGHIRANO	247	219	68,678	70,535	278	322
LLS-PARMA	626	531	319,226	329,196	509	620
Total	1392	1,178	596,339	615,513	428	522

Source: own elaboration

Table 4. Milk production system by ?? approximate altitude and year: province of Parma

Altitude	Total milk (in Tons)		No. of milk producers	
	2007	2012	2007	2012
Hill	209,830	222,608	544	447
Mountain	585,03	57,504	240	205
Lowland	328,006	335,401	608	526
Total	596,339	615,513	1,392	1,178

Source: own elaboration

Between 2007 and 2012 concentration in the number of breeders and volume of milk produced by LLS does not diverge significantly. LLS-Parma slightly increased its share, but nevertheless remained at around 45 % of total farms and 53 % of the volume of milk produced. LLS-Fidenza with 32 per cent of all

farms and 33.5 per cent of milk production is the second major area of production of the province; LLS-Langhirano lies in third place with 18.6 % of farmers and 11.5 % the volume of milk; concentrations of farms and milk volumes of Borgo Val di Taro LLS-and LLS-Bedonia are lower at 3.3 and 1.4 per cent in Borgo Val di Taro and 0.8 and 0.2 % in Bedonia.

These changes, total reduction of farms and total increase in milk production, have also affected the structure of the farms and led to a greater concentration of production on larger farms. The farms with an output of less than 200 tons decreased by 27%, and the farms with an output between 500 and 1,000 tons of milk decreased by 18%) ??? But medium-large and large farms increased significantly. Milk producers with more than 3000 tons of milk show an increase of 67% (from 12 to 20), while farms that produce between 1000 and 3000 tons increased by 27% (+ 32 farmers) (Table 5, Table 6).

Taking into account the weight of each class within each Local Labour System in 2012, it is possible to consider how the level of concentration in milk production changes according to altitude. In mountain areas, small farms prevail, while in the low-land, milk production is concentrated in large farms (Table 6). If the variation in milk production between 2007 and 2012 is broken down by size of farm, both farms and milk production can be seen to have declined for the first three classes and increased for the last two. These types of farm accounted for about 50 per cent of total milk production in 2012, with an increase of over 10 % compared to of 2007.

Table 5. Structure of the milk production system by LLS and year: number of milk producers by production size (in t.)

LLS	<200	200-500	500-1000	1000-3000	>3000	Total
2007						
LLS-BEDONIA	12		2			14
LLS- B.GO VAL TARO	27	12	2	1		42
LLS-FIDENZA	186	152	80	43	2	463
LLS-LANGHIRANO	136	70	33	7	1	247
LLS-PARMA	232	198	121	66	9	626
Total	593	432	238	117	12	1,392
2012						
LLS-BEDONIA	8		1			9
LLS- B.GO VAL TARO	29	8	1	1		39
LLS-FIDENZA	124	129	70	50	7	380
LLS-LANGHIRANO	107	69	30	12	1	219
LLS-PARMA	166	174	93	86	12	531
Total	434	380	195	149	20	1,178

Source: own elaboration

Table 6. Structure of the milk production system by LLS and year: volume of milk production by production size (in t.)

LLS						Total
	<200	200-500	500-1000	1000-3000	>3000	
	2007					
LLS-BEDONIA	545		1,660			2,206
LLS- BGO VAL DI TARO	2,380	3,015	1,141	2,036		8,572
LLS-FIDENZA	20,452	47,973	55,560	66,133	7,539	197,657
LLS-LANGHIRANO	13,826	20,731	21,653	8,475	3,994	68,679
LLS-PARMA	25,340	65,487	83,697	104,440	40,263	319,227
Total	62,543	137,206	163,711	181,085	51,795	596,340
	2012					
LLS-BEDONIA	463		799			1,262
LLS- BGO VAL DI TARO	2,784	2,166	647	2,928		8,524
LLS-FIDENZA	13,849	40,400	48,747	80,582	22,418	205,996
LLS-LANGHIRANO	11,534	21,612	19,965	13,622	3,803	70,535
LLS-PARMA	17,254	59,403	65,875	129,250	57,415	329,196
Total	45,883	123,581	136,033	226,381	83,636	615,514

Source: own elaboration

The structural evolution of the milk production in the province has had big effects on the Parmigiano Reggiano system, with structural, commercial and strategic implications. At the level of the dairy it is clear how the system is gradually changing over time in the province of Parma. The most important phenomena are:

- The decrease in the number of dairy farms: over 35 dairies have gone out of business (- 17.1%);
- The structural change of the dairies: the number of dairies that process more than 5,000 tons of milk has increased;
- The changes in milk destination: there has been a significant increase of milk destined for use different from Parmigiano Reggiano cheese and the volume of milk processed outside the province of Parma has increased;
- The steady increase in the production of milk for processing into Parmigiano Reggiano: this share amounted to 2.4 per cent (approximately 13,500 tons of additional milk).

In relative terms, the decrease in the number of dairy units is mainly concentrated in the LLS-Bedonia and LLS-Borgo Val di Taro, which lose, respectively, 100% and 50% of their dairies. These LLS are mountain areas, and the disappearance of dairies is a serious threat to the future of milk production in these areas. Equally disturbing are the variations in the other three LLS, Parma, Fidenza and Langhirano. These systems together represent in 2012 about 99% of total dairies and volume of milk processed of the province. LSS-Parma, although it is the most important (51 % of the dairies and 50 % of processed milk), lost 16 dairies (-15%) while LLS-Fidenza lost 14 dairies (-19%). LLS-Langhirano, (14% of dairy units and 12% output of the province), lost 4 dairies (-14%) (Table 7).

The process of restructuring in dairy system is accompanied by a process of gradual concentration of production in larger dairies and changes in management. Overall, in the province of Parma only dairies that process more than 5,000 tons of milk increased (+12 compared to 2007), while all other structures decreased. More precisely, in 2012, the dairies that process less than 5,000 tons lost a total of 48 units and

represent 82% of the dairies compared to 91% in 2007 (Table 8). At the same time, the volume of milk processed by large dairies increased significantly, accounting for 46% of processed milk compared to 31% in 2007, representing only 18% of dairies (Table 8).

Obviously the concentration process is not taking place at the same pace in the all Local Labour Systems. The LLS-Parma stands out as the one that most increases both the number of large dairies (over 5,000 tons) as well as the volume of milk processed. In contrast, the LLS-Fidenza shows biggest the reduction of the number of small and medium dairies (Table 9).

Table 7. Structure of the Parmigiano Reggiano production system by LLS and year

	2007			2012		
	N. of dairy	Processed Milk (in tons)	Average processed milk by dairy (in t.)	N. of dairy	Processed Milk (in tons)	Average processed milk by dairy (in t.)
LLS						
LLS-BEDONIA	1	1,875	1,875			
LLS-BORGIO VAL DI TARO	2	4,175	2,087	1	4,148	4,148
LLS-FIDENZA	74	209,679	2,833	60	207,550	3,459
LLS-LANGHIRANO	28	67,051	2,394	24	71,656	2,985
LLS-PARMA	105	289,631	2,758	89	290,822	3,267
Total	210	572,412	2,725	174	574,178	3,299

Source: own elaboration

Table 8. Number of Parmigiano Reggiano dairies by size, LLS and year

LLS	Dairy size (in tons)					Total
	< 1000	1000-2000	2000-3000	3000-5000	> 5000	
2007						
LLS-BEDONIA		1				1
LLS-BORGIO VAL DI TARO	1			1		2
LLS-FIDENZA	18	17	21	10	8	74
LLS-LANGHIRANO	7	6	9	5	1	28
LLS-PARMA	14	41	13	27	10	105
Total	40	65	43	43	19	210
2012						
LLS-BEDONIA						
LLS-BORGIO VAL DI TARO				1		1
LLS-FIDENZA	11	12	15	12	10	60
LLS-LANGHIRANO	4	6	7	4	3	24
LLS-PARMA	12	25	17	17	18	89
Total	27	43	39	34	31	174

Source: own elaboration

Table 9. Volume of milk processed by Parmigiano Reggiano dairies by size, LLS and year

LLS	Dairy size (in tons)					Total
	< 1000	1000-2000	2000-3000	3000-5000	> 5000	
2007						
LLS-BEDONIA		1,875				1,875
LLS-BORGO VAL DI TARO	24			4,150		4,175
LLS-FIDENZA	9,406	25,938	52,811	37,726	83,796	209,679
LLS-LANGHIRANO	4,379	10,476	21,776	17,467	12,952	67,051
LLS-PARMA	6,408	62,776	32,556	104,869	83,020	289,631
Total	20,217	101,066	107,143	164,214	179,769	572,412
2012						
LLS-BEDONIA						
LLS-BORGO VAL DI TARO				4,148		4,148
LLS-FIDENZA	7,325	18,958	36,891	46,242	98,132	207,550
LLS-LANGHIRANO	2,876	8,288	17,227	14,352	28,911	71,656
LLS-PARMA	7,454	38,487	40,195	69,487	135,198	290,822
Total	17,655	65,735	94,314	134,231	262,242	574,178

Source: own elaboration

Another aspect that emerges from the analysis is the evolution of ownership structure of dairies producing of Parmigiano Reggiano. Co-operative structures are being particularly badly hit by the concentration process, showing increasing difficulty in finding new milk, preventing members from selling milk to private dairies. This phenomenon emerges very clearly if it is considered that overall co-operative dairies have lost about 23,000 tons of milk to industrial dairies. The difficulties of co-operative dairies are also confirmed by economies of scale which are smaller than in faster growing private dairies. Finally, the analysis highlights how the LLS-Parma concentrates the largest number of dairy farms of all the province taking a clear advantage from the relationship with the consumer market of the city. (Table 10)

Finally, an important aspect that should be considered in the analysis is the balance between milk processed and milk produced in the province of Parma (Table 11). The LLS interact with each other; in some cases milk is imported from LLS, while in other cases milk is exported to other LLS of the same province or outside the province. In 2007, the area of Parma exported around 4,500 tons of milk for cheese production and about 19,000 tons for the milk industry. In 2012 this picture changed dramatically: milk for cheese production that is exported from the province amounted to approximately 16,000 tons while that for industrial processing amounted to approximately 24,800 tons. Overall each year, the Parmigiano Reggiano system of the Parma area “is losing” more than 41,000 tons of milk. In this context, LLS-Fidenza shows how its dairies sell milk for the production of Parmigiano Reggiano and also to other LLS for industrial use. In the LLS-Parma the opposite phenomenon takes place as in 2012, milk was mainly exported for cheese production (over 37,800 tons). Again with reference to 2012, the average level of self-sufficiency for the LLS of Langhirano, Fidenza and Parma is around 80%, while in the LLS of Borgo Val di Taro only 48% of the milk is processed within the same LLS and 33% goes out of the province. In the LLS of Bedonia all the milk produced goes outside the province of Parma (Table 12).

Table 10. Evolution of milk processing structure by dairy typologies, LLS and year

Years	2007				2012			
	Dairy Farm	Industrial	Coop.	Total	Dairy Farm	Industrial	Coop.	Total
	N. of dairy							
LLS-BEDONIA		1		1				
LLS-BORGO VAL DI TARO	1		1	2			1	1
LLS-FIDENZA	18	21	35	74	13	19	28	60
LLS-LANGHIRANO	5		23	28	4	1	19	24
LLS-PARMA	26	24	55	105	21	22	46	89
Total	50	46	114	210	38	42	94	174
	Processed Milk (in tons)							
LLS-BEDONIA		1,875		1,875				
LLS-BORGO VAL DI TARO	24		4,151	4,175			4,148	4,148
LLS-FIDENZA	21,536	84,114	104,029	209,679	19,167	100,604	87,779	207,550
LLS-LANGHIRANO	2,990		64,062	67,052	3,384	1,512	66,761	71,657
LLS-PARMA	36,477	87,569	165,585	289,631	45,053	89,957	155,813	290,823
Total	61,028	173,559	337,827	572,413	67,603	192,072	314,502	574,178
	Dairy average size (in tons)							
LLS-BEDONIA		1,875		1,875				
LLS-BORGO VAL DI TARO	24		4,151	2,088			4,148	4,148
LLS-FIDENZA	1,196	4,005	2,972	2,834	1,474	5,295	3,135	3,459
LLS-LANGHIRANO	598		2,785	2,395	846	1,512	3,514	2,986
LLS-PARMA	1,403	3,649	3,011	2,758	2,145	4,089	3,387	3,268
Total	1,221	3,773	2,963	2,726	1,779	4,573	3,346	3,300

Source: own elaboration

Table 11. Balance between processed milk and milk production in province of Parma by LLS and year (in tons)

LLS	2007			2012		
	Chiese	Industrial Milk	Total	Chiese	Industrial Milk	Chiese
LLS-BEDONIA	449	- 779	- 330	- 1,262	-	- 1,262
LLS-BORGO VAL DI TARO	- 1,651	- 2,744	- 4,396	- 1,190	- 3,185	- 4,375
LLS-FIDENZA	28,990	- 16,968	12,022	22,594	- 21,039	1,554
LLS-LANGHIRANO	- 1,627	-	- 1,627	1,191	- 70	1,121
LLS-PARMA	- 30,699	1,103	- 29,595	- 37,820	- 552	- 38,373
Total	- 4,537	- 19,389	- 23,927	- 16,487	- 24,848	- 41,335

Source: own elaboration

Table 12. Percentage of Milk processed in each LLS

LLS	LLS-BEDONIA	LLS-BORGO VAL DI TARO	LLS-FIDENZA	LLS-LANGHIRANO	LLS-PARMA	Others Provinces
2007						
LLS-BEDONIA	64,6%	0,0%	0,0%	0,0%	35,4%	0,0%
LLS-BORGO VAL DI TARO	5,2%	48,0%	0,0%	0,0%	23,2%	23,6%
LLS-FIDENZA	0,0%	0,0%	86,0%	0,0%	7,3%	6,6%
LLS-LANGHIRANO	0,0%	0,0%	0,9%	80,3%	18,8%	0,0%
LLS-PARMA	0,0%	0,0%	12,2%	3,7%	81,3%	2,8%
2012						
LLS-BEDONIA	-	0,0%	0,0%	0,0%	0,0%	100,0%
LLS-BORGO VAL DI TARO		48,0%	0,0%	0,0%	18,4%	33,6%
LLS-FIDENZA		0,0%	78,9%	0,0%	10,3%	9,2%
LLS-LANGHIRANO		0,0%	6,5%	82,9%	9,1%	0,0%
LLS-PARMA		0,0%	12,3%	4,0%	79,4%	4,5%

Source: own elaboration

3. CONCLUSIONS

Despite the famous name of Parmigiano Reggiano cheese and the strong governance of the Parmigiano Reggiano Consortium the production system linked to the cheese is undergoing big changes. Just a few decades ago, sustainability was considered as one of the main characteristics of this production system, but nowadays it seems that growth and efficiency are more important commitments. It is clear that large dairy companies in lowland areas can be more efficient and effective on the market than small dairy cooperatives. But the new production system, where the territorial relationships with the social and environmental dimensions are weaker, is making the cheese more of a market product..

The process of concentration at both farm and dairy level is linked to the decline in milk production in mountain areas.

These two phenomena, and the fact that an increasing volume of milk is leaving the area of Parma and no longer going into cheese production, reflect the difficulties of implementing effective policies to pay producers with higher production costs and thus specific local production factors. The consequence is that the idea of sustainability surrounding the cheese, which has been produced for 900 years, is becoming less important. This will have a negative impact on the reputation of the product.

These conclusions are perhaps not totally surprising, considering that the Parmigiano Reggiano Consortia has only recently introduced more restrictive norms on the links with the production area. Moreover, it i) is not a real inter-branch organization, and ii) until today has not had the legal tools to control supply of milk effectively. Thirdly, iii) mountain producers until today have not been permitted to brand their cheese as a “*mountain product*”. But these norms are not the exclusive domain of the Parmigiano Reggiano Consortia; the participation of all local institutions is needed in order to keep high the reputation of the Parma LAFS.

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