

# The Modern Agricultural Cooperative: A Cognitive-Knowledge- Based Approach

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Please cite this paper as:

Fontanari, E. (2017), The Modern Agricultural Cooperative: A Cognitive-Knowledge-Based Approach, *Euricse Working Papers*, 91|17.

# **The Modern Agricultural Cooperative: A Cognitive-Knowledge-Based Approach\***

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## **Abstract**

The new agri-food market scenario is considered a detrimental factor for the competitiveness and financial equilibria of the agricultural cooperatives. According to this vision, as a result of the saturation and globalization process, the shift of the specific investment at the forward level of the supply chain (i.e., for the brand development, or for R&D activities) would be a serious threat for the cooperative model. These assumptions come from a transaction cost and property rights-based framework. The results of these studies are surely insightful and valuable, but they should be integrated with the strengths in terms of knowledge integration (and coordination) assured by the agricultural cooperative model. This work is aimed at updating the function/justification of modern agricultural cooperatives. Firstly, a theoretical contribution mingling the knowledge-based theory of the firm with the social innovation approach in agriculture will be defined. Secondly, two case studies will be discussed.

## **Keywords**

Agricultural cooperatives; Agri-food; Innovation

## **JEL codes**

Q13; O31; O35

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\* This research has received financial support by the European Commission in the framework of the project “International Research Exchange on Cooperatives” - INT.RE.COOP (PIRSES-GA-2012-318991), funded under the Marie Skłodowska-Curie Actions (FP7-PEOPLE-2012-IRSES) and by the Autonomous Province of Trento (Italy).

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## 1. Introduction

This work is an attempt to stress the importance of the immaterial factors justifying the existence of modern agricultural cooperatives (cfr. Fontanari, 2014). In the last decades, great attention has been paid to the weaknesses of the property and governance structure of this organizational arrangement (Cook, 1995; Nilsson, 2001; Chaddad and Cook, 2004; Cook and Burrell, 2009). In a transaction cost and property rights-based framework, the main criticality is referred to the lack of an ‘optimal’ investment incentive. Above all, in the new agri-food market scenario, this is considered a detrimental factor for the competitiveness and financial equilibria of the agricultural cooperatives. According to this vision, as a result of the saturation and globalization process, the shift of the specific investment at the forward level of the supply chain (i.e., for the brand development, or for R&D activities) would be a serious threat for the cooperative model (Hendrikse and Veerman, 2001). In fact, its “ill-defined” property rights would lead to generate an inadequate amount of financial resources at the downstream (agricultural cooperative) level.

The results of these studies are surely insightful and valuable, but they should be integrated with the strengths in terms of knowledge integration (and coordination) assured by the agricultural cooperative model. Though a part of literature has recognized the increasing importance and strategic role of the knowledge and of its management in the agri-food chain (Sporleder and Moss, 2002; Sporleder and Peterson, 2003; Sporleder, Jackson and Bolling, 2005; Sporleder, 2006; Sporleder and Wu, 2006; Sporleder and Boland, 2011), in these cases the knowledge seems to assume the nature of a ware, to deliver from one agent to another. In particular, these contributions stress its passage from the growers (agricultural production) to the downstream/consumer level (IP traceability, cfr. Sporleder and Goldsmith, 2001; Goldsmith and Bender, 2004). The attention has so been paid only on the quality-signalling strategies (Sporleder and Goldsmith, 2001) and therefore on the produce’s attributes (extrinsic and/or credence). In this way, the nature and the role of the knowledge have been restricted exclusively to this heuristic meaning. As a result, according to this theoretical perspective, the more important task of the firms operating in the (different nodes of) agri-food chain is to favour a communication channel between the upstream and downstream agents, in order to reach the coordination among them. The knowledge is therefore defined only with reference to the produce’s attributes and its transportation from one node to another as the main activity in the agri-food chain (‘s firms). Clearly, the proposed interpretation represents a myopic vision of both the nature and the role of the knowledge in the agri-food sector. However, the more surprising thing is that there is no reference to the function of the agricultural cooperative. Recently, an effort to update the coordination challenge in the agri-food chain has been done by Bijman, Muradian, Cechin (2011) and Cechin (2013)<sup>1</sup>, by including two other types of mechanisms, such as community and democracy-based ones, and so the specific role of the agricultural cooperatives, but also this reasoning is anchored to the transaction cost approach.

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<sup>1</sup> Feng and Hendrikse’s contribution (Feng and Hendrikse, 2011) also represents an effort to deepen the role of agricultural co-op against to IOF (investor-owned firm) in coordinating the actions of agri-food chain’s different agents, but in a game theory fashion and without putting emphasis on the social process at the basis of knowledge production, sharing and diffusion.

## 2. Knowledge-based theory of the firm and the “agriculture practice”: a possible link?

To understand and inform adequately the function/justification of modern agricultural cooperatives, it is necessary to mingle the knowledge-based theory of the firm with the social innovation approach in agriculture. By so doing, it is possible to define a more realistic and comprehensive approach to study the role of knowledge in the productive activity, linking it to a more correct interpretation of the innovation process in agriculture. This *modus operandi* allows to highlight the strength point of the agricultural cooperative’s institutional/organizational architecture (design) obscured by the other theoretical approaches.

Starting from the knowledge-based theory, it means the firm as an institution aiming at integrating and coordinating a set of (different) specialized knowledge (competences) for producing goods and services (Grant, 1996). In this case, the logic underpinning the firm is explainable with the Smithian virtuous circuit of “division of labor-specialization-increase of productivity/efficiency”. Therefore, the firm exists to integrate this specialized knowledge and the unique way to obtain this result is by defining an organizing (higher-order) principles bundle. Because “the central advantage of firms in the production process is not simply an avoidance of the transaction costs associated with market exchange, but their ‘unique advantages for governing certain types of economic activities from a logic that is very different from that of market’” and “integrating the knowledge of many different individuals in the process of producing goods and services is such a logic” (Grant, 1996: 113).

Given that “efficiency in knowledge production (by which I mean the creation of new knowledge, the acquisition of exiting knowledge, and storage of knowledge) requires that individuals specialize in particular areas of knowledge” (ibid.:112).

From this viewpoint, the organizational design represents a peculiarity of the firm (managerial choice) that consists (also) in the opportunity to create interdependence (Willem and Buelens, 2009), which is not therefore determined exogenously by the prevailing production technology (Grant, 1996). In fact, “the division of tasks between individuals and departments and the specification of interfaces between them lies within the domain of organizational design” (ibid.: 114).

This type of reasoning (vision) is very important because it allows us to include other fundamental elements in studying the firm. Elements that can reveal their informative importance in the analysis of the modern agricultural cooperatives justification.

However, setting up the set of organizing principles, such as rules, procedures, norms/conventions, for coordinating and integrating these different knowledge areas needs a common identity and developing a common language and code. In this sense, the firm represents a community and sense-maker organization (Kogut and Zander, 1992; 1996). Therefore, first of all, the firm has the function to build up the social context within which the social interaction (the production process) could occur and therefore the organizing principles can operate. The intersection between the individual knowledge of all organizational members constitutes common knowledge. This last one is the outcome of the knowledge integrating activity of the firm, which creates a new inter-division knowledge to help the different areas to communicate between them. This social knowledge is indispensable and functional to coordinate the overall production process. In particular, it creates the

conditions to favour and foster the speed of knowledge transfer and sharing between the divisions; above all, regarding the tacit knowledge, given its immobility (based on the owner-agent's willingness to share it). In this way, the firm promotes a social learning between competences, even by means of a "story telling" mechanism<sup>2</sup> (Brown and Duguid, 1991), which is extremely conducive of (tacit) practice-based knowledge, thereby stimulating a social innovation process. From this viewpoint, the firm can be defined as the community of communities (of practice) (ibid.).

This interpretation of the firm is extremely similar and compatible to that proposed by Engel (1995) regarding the social organization of innovation in agriculture. Engel's contribution is informative to understand the real process of knowledge and innovation exchange in agriculture. According to this approach, the innovation in agriculture goes on by means of an interplay between practices, in order to (re-)define and pursue a shared agricultural development pattern (World Bank, 2008). As a result of this exchange (between social practices), the agricultural model and the practices are upgraded. The definition of what is a good farmer or a good technical specialist is meant as an outcome of this process. In fact, the competent performance of a specific practice is regulated not only by the defining and experience rules developed within that practice, but it is also influenced by the non-practitioners (lay). So, for example, the evolution of the extensionists benefits even from the insights of farmers (practice) and vice-versa, and so on. For this reason, the agri-food chain can be renamed "agriculture practice". This concept represents the essence of the social theatre characterizing the innovation in agriculture according to Engel's vision. In fact, he introduces this term to underline the exchange of ideas, world views and knowledge understood as information and know-how at the basis of a continuous (re-)definition of the practices and of the agricultural development pattern (Garcia-Winder et al., 2009). This last step represents the crossing point between his approach and the knowledge-based theory of the firm. The dynamics underlined in the social theatre of innovation in agriculture is very similar to those depicted in the firm as a social community.

Finally, it is interesting to notice that this type of innovation process (networking *à la* Engel) in agriculture lies at the opposite side of the linear model based on a top-down approach (Sulaiman and Hall, 2002; World Bank, 2006; 2008; Agwu, Dimelu and Madukwe, 2008; Minh, Neef and Hoffmann, 2011; Akkoyunlu, 2013). In fact, in Engel's model, there is a co-participation in the agriculture innovation and no practice has a more important role than the others do. Each practice is equally significant, also the farmers have a strategic role. Nevertheless, in particular, this conceptual shift is important to underline that there is no need to separate what is defined as the agri-food chain in independent units (nodes). In a similar meaning used by Sporleder and Peterson (2003) in defining the supply chain in the learning organism version. However, Engel's reasoning differs from Sporleder's because it puts the agriculture (practice) at the middle.

Starting from these considerations, the next paragraph introduces a concept of agricultural cooperative meant as an institution building up the operational structure for the social theatre of innovation in agriculture.

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<sup>2</sup> Stimulating and assuring a certain level of "cognitive heterogeneity" (cfr. Nooteboom, Van Haverbeke, Duysters et al., 2007).

### 3. Agricultural cooperatives: an institutional design for fostering innovation in agriculture

By adopting this theoretical framework, the agricultural cooperative can be meant as an institutional design (architecture) to create the structure for the social theatre previously described. Specifically, the farmers' production activity needs several strands of specialized knowledge and the cooperative represents the institution integrating and coordinating this different specialized knowledge. In this case, each of these specialized groups constitutes a practice and so, besides the coop divisions, even the farmers are a specific practice. The borders of the agricultural cooperative include (strands of) knowledge that it considers relevant for that specific "agriculture practice". To exploit deeply its internal knowledge, the cooperative can also set up alliances to integrate its knowledge base with that owned by other external actors (practitioners). From this viewpoint, the agricultural cooperative represents a community of communities (of practices). A sense-making organization that by means of an organizing principle set facilitates the interplay among these sub-communities. In the case of agricultural cooperatives, the cooperative values and principles<sup>3</sup> establish a formidable anchor in building up an identity (community). This point has not scarce relevance, given that the construction of an identity implies the construction of a (innovation) productive system (World Bank, 2008; Anandajayasekeram, 2011). Then, by this way, a (joint) social learning process can occur and lead to new (re-)combinations of knowledge (*à la* Schumpeter)/ideas and, finally, to a (joint) social innovation in agriculture *à la* Engel (Armitage, Marschke and Plummer, 2008). As affirmed in the previous paragraph, this process is indispensable and strategic above all with reference to the activation and sharing of tacit knowledge. In this sense, the organizational routines (procedures, rules, etc.) developed by the agricultural cooperative play a precious and irreplaceable role in creating the conditions at the basis of this process functioning. "These conditions include propinquity and 'low powered' incentives designed to foster coordination between individual specialists which avoid the problems of opportunism associated with the 'high powered' incentives directly related to knowledge transactions" (Grant, 1996: 112]

The agricultural cooperative serves hence to create a common language and code by which it basically communicates "who knows what" and "how the process is organized" as indicated in the Grant's contribution on the knowledge-based approach of the firm. In the agricultural cooperative, a particular (cognitive) proximity appears to lie in the relationship between the farmers and the technical specialists (i.e. agronomists). These last ones could be meant as border spanners between the cooperative and the farmers and vice-versa. They develop and upgrade their practice especially through the interaction with both the other co-op's divisions (practices) and the farmers (another practice). In both cases the technicians pick up and provide relevant information that fosters the social learning and innovation in (and along) the productive system, or better, in the "agriculture practice". Specifically, this peculiarity allows the cooperatives to gather and manage the indigenous (farmers') knowledge (Bentley, 2006; Kummer et al., 2010). However, in general, the distinctiveness of the agricultural cooperative is referred to its ability to put together and organize the relevant competent

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<sup>3</sup> See Sacchetti and Tortia's contribution (2013) about their importance and implications in terms of internal and external governance.

performances of the agriculture practice. By so doing, it creates the conditions for establishing the correct interdependencies among the practices, but in a non-artificial sequential way through a community-based mechanism. This means that the agricultural cooperative builds up a social context, rather than a lifeless one. In fact, it is the grey (lay) area of the knowledge intersections (social interactions) among all the agriculture practice's "stakeholders" that can put the basis for the social learning and innovation in the agri-food chain, here more correctly named as "agriculture practice". The stakeholders' bundle can include the farmers, the technicians, the salesmen, but also the consumers, whereas they interact directly or indirectly with the productive system (co-ops' practices). In this sense, it becomes very intuitive understanding the importance of developing a common language/code and a common vision-identity (cognitive schemas and framework).

From this viewpoint, the agricultural cooperatives' strength point seems to rest on their specific governance and property rights structure. In fact, whereas the importance of knowledge as a strategic resource for the agricultural productive process is increasing even more, the growers have to be included within the borders of the "firm". In particular, the institutional architecture assured by the agricultural cooperative, by developing the above cited concept of social context (agriculture atmosphere) (Kogut, 2000; Dyer and Nobeoka, 2000), creates the conditions for an efficient knowledge production ("the creation of new knowledge, the acquisition of existing knowledge, and storage of knowledge" *à la* Grant), which implies also an efficient sharing and diffusion of knowledge along and within the productive system. This process stimulates, in turn, an indirect empowerment of the social learning process, which reflects itself on the knowledge production and of which benefits the entire "agriculture practice".

Whereas Valentinov (2007) emphasizes the strategic function of the agricultural cooperatives in fostering/assuring the division of labour in agriculture, aiming at maintaining a family-farm model in agricultural production to avoid the high monitoring costs in farming operations (Tortia, Valentinov and Iliopoulos, 2013); this contribution stresses the importance of agricultural cooperatives in building and preserving a division of labour among competent performances to create the social theatre of innovation in agriculture. This interpretation is useful to introduce a systemic organizational capability<sup>4</sup> specific to the agricultural cooperative, which could develop a competitive advantage (Dyer and Singh, 1998) and ensure a Ricardian rent (Peteraf, 1993 cited in Cook and Plunkett, 2006).

The presentation of two case studies can help us to understand the relevance of the proposed approach.

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<sup>4</sup> At the basis of the couple "casual ambiguity-idiosyncratic resources".

## 4. “Agricultural practice” in practice

### 4.1 *Sant’Orsola*<sup>5</sup>

Sant’Orsola is an agricultural cooperative situated in the province of Trento, an area of the Northern-East Italy, which represents the 1 per cent of the entire national territory. Sant’Orsola was set up at the beginning of the 1970s to recover the economy of a mountain area, the Mòcheni Valley. Over the years, thanks to the success of this entrepreneurial initiative, its activity has interested most of the part of the provincial territory, representing a development opportunity for other mountain areas. Now, Sant’Orsola represents the leader of the Italian berries market, with a market share around the 45 per cent. It applies the traditional governance structure by employing the cooperative principles fully. The main activity of Sant’Orsola is marketing the fresh berries delivered by members. In this sense, it appears like a marketing cooperative, but its activity includes also selling the input to members and provides them with a multifaceted services bundle. Therefore, in common technical terminology, Sant’Orsola may be included in the hybrid category.

The entrepreneurial path undertaken by Sant’Orsola started from a problem-solving group set up by the Mòcheni Valley residents and the local government to identify a solution to avoid the abandonment of this mountain area. This committee indicated as the only possible receipt the introduction of a new cultivar: the berries. This type of cultivation did not exist until then, either in Trentino or in the rest of Italy. In this case, the agricultural cooperative has represented the organizational institution functional to develop the knowledge base necessary to cultivate the berries. The co-op’s founders owned basic agronomic competences and so the pooling of their knowledge has been the pillar on which the required agricultural techniques were built up. To update the technical knowledge, both in this initial phase and over the years, the cooperative has aimed at learning and deepening (through networking) the best practices around the world, adapting them to the local territory by a trial and error process in the field. This process has characterized not only the construction of the farming techniques, but it is used also nowadays as a problem-solving tool (method). This organizational routine helps us to understand the fundamental and worthwhile function of the tacit knowledge (know-how) in this organization. Furthermore, given that this co-op’s membership has increased from the initial 70 members to the present 1,000, of which about 56 per cent refers to part-time growers, the role of the knowledge transfer is even clearer as a superior productive factor. In fact, in year 2000 Sant’Orsola set up a technical division. Substantially, they hired as technicians the members that until then operated *de facto* as technical consultants for the other members. This strategic component knowledge has been therefore internalized into the co-op’s boundaries. This step is not casual or worthless. In fact, it is important to underline that over the years Sant’Orsola has built up and structured other relevant divisions to gather and manage other knowledge strands, such as the marketing one. For this reason, the internalization of the technical competences needed to integrate them with the other ones for enhancing the interplay between these communities. To this purpose, Sant’Orsola has set up specific inter-practice committees, including even some components of the board of directors (growers’ representatives), to enforce these positive synergies (team coordination mechanism; *cfr.* Willem and Buelens, 2009). An example is given by the activity carried out by the technical division in the co-op’s experimental field. In fact, its research activity, aimed at creating new varieties and testing existing varieties of berries, is operated by

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<sup>5</sup> An in-depth case study in Italian on Sant’Orsola agricultural cooperative is forthcoming in the Euricse Working Paper Series.

following the insights on the produce's attributes shared by the sales and marketing divisions during these inter-practice meetings. In the same way, it may happen that also the technicians submit some new varieties to the marketing/salesmen so that they could investigate their market appeal. In addition, Sant'Orsola owns a research greenhouse in which technicians test the growth and resistance capacity of the varieties, experiment new cultural techniques and verify the productive capacity of the plants. These research activities may need the collaboration of the farmer. In this case, the cooperative uses part of the member's field, establishing an interactive learning and leading to a farmer's co-participation in the research activity. However, Sant'Orsola fosters the members' involvement also organizing several technical meetings during the year with the members in order to share and discuss all the relevant information about the farming operations and about how the productive system is structured and the division of labour works within it. These types of interrelationships are further enhanced through the daily personal relationships between the technicians and the farmers (members) in the field<sup>6</sup>. This social interaction puts the basis for the running of the social learning process discussed above. In fact, the resulting problem-solving mechanism allows to update and improve both the technicians practice and the growers' one. Furthermore, the personal relationship and the cognitive proximity between these two actors (practitioners) also facilitate the transfer and the sharing of the indigenous knowledge. The results of all this knowledge production are concentrated in a sort of the *Sant'Orsola member's handbook* that the cooperative updates and sends to all the members every year. Basically, it represents the outcome of the interplay in the agriculture (berries) practice operated in the Sant'Orsola "social theatre". In particular, this handbook is a codification of the knowledge produced by the social interactions in the grey areas of the intersections between the practices. It adopts a context-specific code based on that particular organizational architecture (and territorial characteristics; cfr. Garofoli, 1993) and hence it is inimitable. So, this codification of the tacit knowledge is very important, above all, for the part-time growers, which represents the most part of the Sant'Orsola membership. In fact, this device represents a complementary tool used by the cooperative, besides the personal relationships, for sharing and spreading the new knowledge along and within the productive system. As a result, this mixed communicational mechanism in turn enhances the social learning favouring the absorptive capacity<sup>7</sup> of the growers, which can also give their contribution in the innovative process. Consequently, they learn not only to be better growers and hence to increase their productivity and the returns of their activity, but also to participate in the social theatre of the agricultural innovation. This can be understood as a co-participation model to the innovative process. First of all, Sant'Orsola has generated a common language, the tools and the interfaces at the basis of this process. An excellent example is represented by the products' quality control mechanism based on a specific procedure defined by the cooperative translating all the knowledge's integration outcome about the type of produce and the cultural techniques in a common guideline. It could therefore well outline a sort of common vision (agreement) about the type of agricultural development pattern reached by the interplay of communities within the agriculture practice. This type of mechanism would be understood by the traditional studies as an authority exercise (control) by half of the firm, instead in the knowledge-based approach it may be meant as an opportunity both for the farmer and for the cooperative to learn reciprocally. The fact that the price paid to the grower is linked to the quality of

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<sup>6</sup> This relationship results even more dense, and so also the members' involvement, for those growers engaged in the nursery activity.

<sup>7</sup> Cfr. Cohen and Levinthal (1990); Zahra and George (2002).

the delivered produce assures the self-enforcement of this mechanism of learning (a mix between market and hierarchic based-governance mechanisms according to the framework of Bijman, Muradian and Cechin, 2011).

It is therefore evident that this agricultural cooperative constitutes an appropriate and unique institutional design. On the one hand, it builds up a series of organizing principles (common language/code) instrumental to integrate the relevant knowledge necessary for the “agriculture practice” and, on the other hand, it creates a common identity among these actors (practitioners). In short, thanks to the cooperative governance and property rights, Sant’Orsola has developed a social organization of the knowledge and innovation production/diffusion in “berries practice”. This is the essence of the agriculture cooperative as a community of communities. It represents the structure of the social theatre depicted by Engel.

#### *4.2 Mfa Incorporated*

Mfa Incorporated (hereafter Mfa) is a North American cooperative that operates particularly in the Midwest area of the United States, specifically in Columbia, Missouri where its headquarters are located. Mfa differs from Sant’Orsola case study, given that this cooperative provides members with inputs for farming operations. For this reason, Mfa is defined as a supply cooperative (Young, 1995).

The Mfa’s activity is focused mainly on providing growers with assistance and products at farm level for producing commodities such as soybean, wheat, etc. and for the husbandry activity. Besides supplying inputs, the cooperative performs a marginal activity in marketing and processing (for seed production) commodities delivered by members (around 30 per cent of their produce). Even if there is a husbandry division that performs a similar and important role in terms of technical assistance, it is interesting to deepen the articulated structure of the agronomy division that supports the farming activities in producing commodities. This choice is functional for a good comparison with the Sant’Orsola case study. The Mfa case study demonstrates that the role of social/personal interaction between cooperative and farmers works well also in the case of standardized mass product and so not only in the case of introducing new-niche cultivar like in the Sant’Orsola experience.

In fact, Mfa shows a systemic process of knowledge exchange and production. The agronomy division gives assistance to farmers by means of the Agri-service, a series of local centres working in the area where Mfa’s farmers-members are located. Agri-service is not only a shop where farmers buy inputs, such as fertilizer or seeds, but it represents also an advisory centre. In fact, the purchasing act implies the interaction between farmers and experts that becomes a learning opportunity for both agents. In addition, the constant and personal assistance provided to farmers by the agronomist staff in the field represents a further face-to-face/story telling interaction. It promotes a knowledge socialization and so a social innovation process. As explained in the previous paragraph, this interaction is a key organizational routine working even in the Sant’Orsola system. This commonality helps to understand how this organizational mechanism becomes instrumental in creating a conducive knowledge environment in the “agriculture practice”.

In particular, in the Mfa system there are two main interaction levels between growers and technicians: a pre-season planning moment, in which the next year production is fixed, and a daily monitoring phase, that is, the interaction in the field and during the purchasing act at the Agri-service. Mfa codifies all the information and knowledge developed during these agronomic activities in a

yearly updated guide. This document helps farmers in their daily activity in the field. Recently, Mfa has also developed applications and ICT devices collecting data on soil fertility, weather, etc. Farmers can so monitor land productivity and identify criticality in order to find, in collaboration with technicians, solutions improving their yields.

Similarly to Sant'Orsola, even Mfa has strict relationships with the local university and private companies developing chemical products and seeds. These collaborations foster a knowledge socialization in the agriculture practice putting different strands of specialized knowledge together. This informative source is useful for farmers who can benefit from and contribute for favouring this process of upgrading in knowledge and innovation production.

Even in this case, it is interesting to notice the pivotal role of the cooperative, which coordinates the different nodes (strands) of knowledge chain and constantly develops new solutions for and with farmers. In so doing, Mfa develops a common (the same) code within this knowledge chain, or better, this community of practice.

In particular, Mfa's agronomy division manages over ten research fields where agronomists develop and test new agricultural techniques, facing new diseases or improving productivity. These fields are usually referred to land lent by farmers who can participate in this way directly to the research activity and pick up the results. Even from this point of view, Mfa is similar to the Sant'Orsola case.

This commonality with the Italian cooperative emerges also from the mechanism of knowledge sharing (socialization) designed by Mfa. In fact, also in this case, the cooperative schedules a monthly interdivision meeting in order to define priorities and exchange strategic information. However, in the specific case of agronomy division, the crucial aspect is that the interaction between agronomists, their director and farmers is circular and works daily. As it has been explained in the Sant'Orsola case study, this social connection among practices permits the building of a productive system, namely, the introduction and diffusion of a common code and language. However, the more important thing is represented by mechanisms enabling a virtuous and systemic process of knowledge/innovation exchange and production.

In this regard, each year, the cooperative organizes a training campus. This initiative represents a very significant learning and educational opportunity for sharing new technologies, agricultural techniques or varieties with Mfa's staff, ag industry personnel and growers. This is a really intuitive and practical way for fostering the knowledge socialization within (and along) the entire community of practice.

In light of the above, Mfa confirms that, also in the case of a supply cooperative, the cooperative organizational architecture (design) is strategic in building up and coordinating a knowledge network in the agriculture practice. This aspect is markedly highlighted by the presence of some systemic organizational capabilities. In fact, Mfa is able to create common knowledge, not only among farmers-members, but within the entire community, including so the ag industry and therefore the overall chain (of agents) supporting the farming activity. In this way, Mfa builds a productive system meant as a network of knowledge developed and managed by the cooperative for supplying a thorough set of services. In particular, the complexity of this productive system is explained by the presence of eight microclimates, which implies a different set of specific knowledge. Each local centre has so a different knowledge repository coordinated by the agronomy division at the Mfa headquarter. In fact, the relational component is a key factor of the Mfa system, which leads to a continuous social interaction and exchange of knowledge and information in a problem-solving

scenario between all the actors of this community. In particular, with reference to farmers, agronomists, the local centre staff and the director, their interactions are very conducive to identification of new problems, so, in finding and creating/introducing new solutions and new knowledge/innovation. New knowledge and innovation that the cooperative puts in motion and spreads along the system by means of both informal mechanisms (codified), like visits in the field, and formal devices, like the Guide for farmers.

The strategic importance of the community-based mechanism working in the cooperative organizational architecture is highlighted by interviews with farmers. In fact, their answers underline the relevance of the personal relationship with the Mfa's technicians. Farmers have no obligation to buy inputs from the cooperative but they decide to do it because they assign a positive and irreplaceable value to the assistance assured by the cooperative. So, when members have to decide where buying farm inputs, they don't base their purchasing choice only on the market incentive. Differently, farmers are willing to pay for inputs a higher price than the market one. They prefer to preserve the relationship with the cooperative and to benefit from its services, or better, from the environment facilitating innovation and knowledge diffusion.

By so doing, members identify and recognize in the cooperative system, namely the cooperative design, a unique and inimitable competitive advantage (for that specific system) based on a strong interconnection of relations or specialized knowledge/network. In fact, as previously said, the entire system of services allows (favours) a continuous interaction and exchange of knowledge and information in a problem-solving scenario (environment). This is a strategic resource for farmers-members, even in a supply cooperative like Mfa.

## **5. Conclusions**

This explorative contribution investigates and stresses a new economic justification of modern agricultural cooperatives. The actual agri-food market requires knowledge-intensive agricultural production. In the sense that consumers ask produce with specific qualitative attributes. Therefore, the link between growers and the other nodes of the supply chain is becoming a strategic element for farm competitiveness. For this reason, the presence of an intermediate institution is central for developing in the agricultural production a network among strategic actors.

It is in this context that the daily activity of agricultural cooperatives shows its effectiveness. The support in terms of internal/external specialized knowledge, that the cooperative makes available to farmers-members, allows to synthesize the needs of the entire supply chain and to create a common code and language and so a productive system. Thanks to this result, growers, but also the agri-food chain as a whole, benefit from the knowledge socialization that activates a constant and very important process of innovation production and diffusion. At this regard, the more important element highlighted by the two case studies is that the driving factor of this process relies on institutional mechanisms (or incentive), intrinsic to the cooperative nature, facilitating face-to-face interactions, above all between farmers and technicians. Furthermore, the research in the field demonstrates that these institutional mechanisms of knowledge socialization work both in marketing (Sant'Orsola) and in supply cooperatives (Mfa inc.).

Besides the classical justification of agricultural cooperatives, in the actual agri-food market scenario a new economic role of this particular institutional design emerges. Future research should attempt to pay more attention to this modern economic function of agricultural cooperatives, in order to better understand their potentialities.

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