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► **To cite this version:**

Véronique Lucas, Pierre Gasselín. Persistence and renewal of cooperation in farm work in French agriculture. International Symposium on Work in Agriculture, Nov 2016, Maringá, Brazil. 11 p. hal-01860872

**HAL Id: hal-01860872**

**<https://hal.science/hal-01860872>**

Submitted on 2 Jun 2020

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# Persistence and renewal of cooperation in farm work in French agriculture

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**Abstract:** *Cooperation in farm work is often considered as a disappearing phenomenon in modern agriculture. This paper analyzes the historical and current factors explaining the persistence and continuous renewal of cooperation in the French context. Some case studies among the French machinery cooperatives were mobilized to illustrate the general trends. Economic and technical transformations of the agricultural work, public policies and social movements historically contributed to change and renew the modes of cooperation in French agriculture. More recently, grass-roots processes have renewed cooperation in farm work, from initiatives triggered by the diversity of French farmers. We finally highlight and discuss the need for deeper research on this complex topic.*

**Keywords:** *cooperation, farm work, machinery cooperatives, sharing arrangements, history*

## Introduction

In the developed countries, cooperation in farm work is often considered as bound to the past, because of the increasing individualization of farm work. Thus labor-sharing arrangements, production cooperation or joint rotation do not receive much attention from scientists and policy makers. Yet, a few existing studies show a diversity of formal and informal modes of cooperation in farm work in the Northern countries (Cornée and Rousselière, 2016). In French agriculture, various modes of cooperation exist which are historically rooted, such as farm machinery cooperatives. Cooperation in farm work has been an issue debated from the French revolution of 1789 onwards, and strongly supported by French farm policies and agricultural advisory services, especially for the past sixty years. Currently, new modes of cooperation are emerging mostly through grass-roots processes.

This paper aims to present a historical and sociological analysis to explain the current persistence and renewal of cooperation in farm work in France.

Since the Neolithic era, worldwide agriculture had given rise to cooperation in farm work. To store, produce, use the land, manage common resources, exchange, face risks, farmers had to cooperate. They cooperated on their own initiative or to follow the direction of the authorities, by adopting common rules built informally or structured by law (Mazoyer and Roudart, 2002; Ostrom, 1990). The worldwide processes of agricultural modernization are generally considered to have increasingly individualized farm work. Moreover, the remaining modern forms of cooperation are seen as predominantly based on commoditization and on technical and management rationality.

How has cooperation been considered in French agriculture since 1789? How and why do farmers work together in France? What are the current evolutions that affect cooperation in farm work? How can we explain that cooperation is organized by the diversity of French farmers? Indeed, we currently observe manifold modes of cooperation in farm work which may be organized by organic farmers involved in direct selling as well as by high tech farmers managing large scale farms. Through cooperation, the farmers involved base their socioeconomic interactions on various rationalities.

To tackle these issues, we will first present a historical analysis of French cooperation in farm work to highlight the role of the following factors in the changes that have occurred: economic and technical changes, ideological debates in socio-political movements and public policies. Secondly, we will complete this review with some illustrations of modes of cooperation from case studies of machinery cooperatives in French local contexts. In the current climate requiring farmers' cooperation to tackle the challenges of the agricultural sector, we will draw some proposals to guide more research on this topic.

## The valuing of cooperation in farm work in French history

This section will give a historical overview of the changes in cooperation since the end of the 18<sup>th</sup> century in French agriculture by distinguishing two periods: the 19<sup>th</sup> and the early 20<sup>th</sup> century, corresponding to ideological debates on cooperation and important transformations in the peasant societies, and the post-war period until the 1970s characterized by modernization processes.

### The 19<sup>th</sup> and early 20<sup>th</sup> century: debates and technical changes

During the 19<sup>th</sup> century, economic and technical transformations recomposed cooperation in farm work. At the political level, the agrarian individualism of the revolutionaries and Republican factions (mainly anticlerical) was firstly opposed to the promotion of cooperation. Whereas this was supported by both the left-wing and conservative (mainly Catholic) factions, Republicans became progressively involved in the social organization of agriculture.

#### Impacts of the French Revolution

The French Revolution is often considered as the entry point of France in modern times. The laws enacted during the revolutionary period (1789-1799) valued individual liberty and private property. They sought to set agrarian individualism in French rural areas, until then characterized by many cooperative uses and practices based on reciprocity (Bloch, 1930).

First, in 1791, a law forbade any intermediary bodies between the state and the individual citizen, included peasant markets and meetings. The revolutionaries then gave a prominent role to the central governing power to organize collective life. In their opinion, corporations, religious orders, clubs and associations were considered as barriers for individual autonomy (Rosanvallon, 2004). Secondly, in 1793, the partition of rural common land was authorized (Lefèvre, 1996).

However, this legislation had contrasting effects throughout France in the following decades for many reasons: political instability, wars, difficulties in implementing national and generic laws in the wide diversity of rural local contexts, etc. (Duby and Wallon, 1976). The impacts of the French Revolution on cooperation in farm work have to be considered together with the effects of the economic and technical transformations induced by the various processes of rural exodus and agricultural crisis that occurred during the 19<sup>th</sup> century.

#### The 19<sup>th</sup> century: triggering the transformation of peasant societies

In his five-feature model of peasant societies, Mendras (1976) highlighted the following characteristics among others: the economic autarky oriented toward family consumption with no distinction made between consumption and production, as well as the only surplus sold on the market. Nicourt (2013) examined their implications on cooperation in farm work within a village of southwestern France. He showed how the mobilization of farm work was once collectively based on reciprocity and barter. Indeed, the mutual help and collective regulation of work aimed at providing labor and social recognition for all. This might have led to the extent of refusing the introduction of external techniques that lightened the workload, for fear of disrupting the social equilibrium. Collective regulation was embedded in a hierarchical organization of the community, sometimes with asymmetrical, even humiliating, relationships between poor and rich members of the village. This particularly occurred with rich landowners providing work or lending equipment to others.

Rural exodus, and later the First World War, induced demographic disequilibrium within this organization. New external techniques were introduced to tackle labor shortage. This increased commoditized exchanges, instead of accessing local techniques with blacksmith farrier through barter. Farmers then tended to produce more for the market, which increasingly individualized productive strategies and recomposed cooperation in farm work. For instance, the introduction of the threshing machine reorganized the extent of the collectives, by mobilizing numerous people for a short time. Thus, an important reorganization of techniques and farm work occurred simultaneously, contributing over the long term to the end of peasant society, such as described by Mendras (1976).

#### Intermediary bodies ideologically returning to favour

At national level, since the early 19<sup>th</sup> century, the Republican individualist-statist vision came increasingly into question by both the socialist and the conservative factions. They both criticized the individualism that they considered to be responsible for the dissolution of the social system.

Associations and other modes of cooperation gradually came to be perceived more positively by the Republican factions (Rosanvallon, 2004). Indeed, from the late 19th century, the creation of trade unions (1884), associations (1901), and cooperatives (1867) were authorized. Economic and social crisis finally contributed to the adoption of a pragmatic position from the Republican governments. The agricultural crisis during the 1860s (such as phylloxera) had encouraged the creation of the Ministry of Agriculture in 1881. The organization of the agricultural profession also became a strategic issue, since it was considered as a major electoral base. The various political factions sought to ensure their influence on rural people. Thus, most of the founders of the first agricultural associations and cooperatives were rural notables often linked to a political faction, such as landowners, representatives, rural teachers, etc. (Hervieu and Purseigle, 2008; Nicolas, 1988).

### **Progressive spreading of formal modes of cooperation**

From the early 20<sup>th</sup> century, self-organized initiatives by farmers progressively spread through economic and formal cooperation. These may have derived from informal networks of cooperation or given rise to re-organization of the existing collectives. Cooperatives were supported by farm policies, through specific credit, tax laws and market organization (Nicolas, 1988).

Thus, during the inter-war period, threshing associations were created by farmers to collectively invest in a threshing machine and share it. In 1929, 2,374 threshing associations were counted throughout France, comprising 76,500 farmers. These allowed farmers to be independent of contractors. Various situations were observed. In some cases, some of these associations may have been created by small groups of richer farmers. In others, they emerged from the existing community networks (Lanneau, 1969; Lefèvre, 1996; Nicourt, 2013).

### **The post war context: modernization and selection processes**

During the Second World War, a collaborationist regime was established in France under German occupation. It gained the support of the Catholic Church and conservative agrarian elites by valuing the “rural traditional virtues”. After the war, French farmers then suffered from a bad image in society, while agrarian elites were weakened owing to their past support for the collaborationist regime. Whereas the low productivity of French farming was denounced by experts, policy makers with the Plan Commission searched solutions to solve food shortages (Boussard, 1979).

From 1945 onwards, various initiatives and social movements in French agriculture have attempted to set “modern” ways of cooperation among farmers, to upgrade their living conditions and to restore farmers' dignity. They then wanted to break with the family and community ways of working to replace them with technical and scientific methods (Nicourt, 2013).

### **Personalist and communitarian ideals of the Catholic Agricultural Youth**

The most important of these social movements was the Catholic Agricultural Youth (called JAC in French) created in 1929 by priests. In 1945, the national leader, René Colson, who was a young farmer, contributed to reshaping the project of this youth movement. Members wanted to turn themselves into protagonists of agricultural modernization. They claimed both personal and collective autonomy, whilst rejecting capitalism and socialism. They were opposed to patriarchal power, as well as to local notables and landowners. Then the movement promoted the capacity of young farmers to use new techniques to improve on-farm production, through numerous educational activities. They also promoted the engagement in farmer organizations in the service of the agricultural profession. Moreover, mechanization led René Colson to specific reflections to avoid small farmers disappearing either by being converted into entrepreneurs or into proletarians. He particularly promoted the collective organization of farmers in machinery co-ops (Nicourt, 2013).

### **Study groups to adopt modern techniques**

Another movement emerged in 1946 from the initiative of a professional elite who created specific study groups called CETA (Center of agricultural technical study). The founders wanted to turn the peasant condition into a profession of farmers by following the principles of scientific management. The CETA allowed farmers to confront experiences, to exchange information and to share their questions to collectively seek solutions. A technician could be employed by one or several CETA, thanks to the membership fees of the farmers, to bring the needed external knowledge. In this framework, the farmers considered themselves as knowledge producers. Young farmers of the Catholic youth movement contributed to creating CETA for smaller farmers during the 1950s. In 1961, there were 1,300 CETA comprising 20,000 farmers (Compagnone, 2009; Nicourt, 2013).

The example of the CETA inspired rural teachers who had a mission of agricultural extension, to develop group methods. To enable all farmers to access study groups, they created study groups called CIVAM (Center for Agricultural Information and Extension), where they played a teaching or/and a facilitation role. In 1957, there were 350 CIVAM in France. As they were ideologically closed to Republican factions, these were particularly developed in regions barely influenced by the Catholic religion, for instance in southern France (Bichaud *et al.*, 2004).

Several policies in 1959 and 1966 sought to make the study groups affordable for all farmers. As a result, in each department, study groups were created and managed by advisors of a specific institution: the Chambers of Agriculture. These employed civil servants with an advisory role, and were run by managers elected from farmers' unions. Whereas a part of the CETA and CIVAM were integrated into this new institutional framework, others wanted to remain independent (Compagnone, 2009; Nicourt, 2013). Indeed, they disputed the domination of the major farmers' union, where former conservative agrarian elites monopolized power quickly after the end of the war (Boussard, 1979).

### **The farm machinery co-op, a French specificity**

In 1945, a law of the socialist Minister of Agriculture created the machinery co-op, mainly to allow farmers to collectively access tractors provided by Marshall Aid. In the following years, several policies dedicated subsidies and credit to machinery co-ops to develop agricultural mechanization. Many threshing associations then turned into co-ops (Nicourt, 2013).

Analysis of René Colson about the strategic need for small farmers to collectively self-organize played a key role in their promotion among young farmers. In the left-wing regions, rural teachers promoted the machinery co-ops. The same occurred with the communist and socialist farmers and rural activists, who were won over to cooperative ideals. In livestock regions, the development of study groups supported by advisors of the Chambers of Agriculture contributed to promoting silage techniques. Many co-ops were then created to allow farmers to share forage harvesters (Lefèvre, 1996). Nicourt (2013) notes that the silage operation needed new collectives to be organized among farmers, sometimes regulated by a labor bank to formalize the former mutual aid. Some farmers seeking to resist this formalization of the cooperation, then tended to be marginalized.

### **Impacts of French agricultural modernization on cooperation**

The French agricultural policies of 1960 and 1962 triggered a new step of the modernization process. Policy-makers defined these policies together with farmer organizations who formed the social movement termed “group agriculture”: national network of CETA, national federation of machinery co-ops, etc. French agricultural modernization policies then strongly promoted farmer cooperation, such as machinery co-ops, supply and marketing cooperatives, study groups and common grouping of farms (GAEC). This wide range of farmer organizations became driving forces to implement a family productivist farm model in France (Nicolás, 1988; Nicourt, 2013).

Over the long term, Nicourt (2013) argues that the modernization process increasingly individualized farm work, unlike the ideals of the pioneering social movements. According to him, the new modes of cooperation generated selective collectives of farmers engaged in the modernization, whilst ignoring the others. By focusing on “group agriculture”, policy-makers and agricultural advisors also ignored the marginalized farmers. Moreover, the increasing commoditization and industrialization of agriculture tended to turn cooperation into tools oriented to increase the farms' profitability and productivity. Nicourt (2013) then concludes that modern forms of cooperation have become driving forces to operate selection and exclusion within the farm population.

Turbulent debates then occurred during the 1970s and 1980s within the agricultural profession, whilst giving rise to divisions among the former young leaders of the JAC (Vercherand *et al.*, 2012). Simultaneously, the influence of the social movements who promoted cooperation significantly decreased (Catholic youth movement, communist farmers' union, etc.) (Lucas, 2005).

## **The continuous renewal of cooperation in farm work**

The present renewal of cooperation in farm work is more developed through grass-roots initiatives, partly thanks to a conducive role of the various study groups existing in France. Indeed, farm policies and social movements such as farmers' unions tend to decrease their support for cooperation in farm work, when compared with the post war modernization period.

## Sharing machinery, workers..., even production

### New trends in machinery co-ops for thirty years

Initially created to share specific expensive machinery, the machinery co-op now allows farmers to reduce significantly their mechanization costs and/or to access higher capacity machinery. 11,000 machinery co-ops now exist in France, comprising one third of all French farms. The average size of such co-ops is about 25 farmers (Fncuma, 2015). To share machinery in the best conditions, co-op members often set labor-sharing arrangements, such as the joint organization of tasks. The network of machinery co-ops promotes labor banks to facilitate labor exchanges between peers.

Nowadays, some farmers have few machines of their own, and mostly use the equipment of their co-op. 350 machinery co-ops are considered “integral”, i.e. the members share more than 80% of their equipment through the co-op. This is generally associated with labor arrangements to coordinate the collective work organization. Some farms may own no tractors and share them in the co-op: this trend has emerged from the late 1980s (Jannot and Vaquié, 1997).

5,000 paid workers are employed by 15% of the machinery co-ops for the maintenance and the driving of the equipment. This particularly occurs in mixed crop-livestock farms, whose cultivation and harvest work is delegated to the co-op and its workers (Fncuma, 2015).

### Emergence of pools of employers

Pools of employers were authorized in 1985 in France to allow several companies to share a worker. Such pools are now mostly created by farmers, to share one or several paid workers. There are now 3,900 pools of employers in agriculture employing more than 23,000 full-time equivalent workers, and half of the shared workers are seasonal (Thibaudot, 2016). Since 2006, the machinery co-op may function as a pool of employers to share worker(s) between the co-op and some farms.

A survey regarding sixty pools of employers in livestock farming regions has shown that they comprise on average three farms to employ one worker, and operate in diverse ways. Previous mutual acquaintance between the farmers involved and the worker is a key emergence factor. The worker is formally employed and paid by the pool, but informality characterizes the daily organizational processes with sometimes few common meetings. Agricultural advisors responsible for developing such pools face difficulties in playing an appropriate support role: their guidelines to formalize the organisation tend to be barely followed by farmers (Chabanet et al., 2000).

### Pooling means of production

For fifteen years, a new form of cooperation is visible, mainly among arable farmers, called the joint rotation. Often derived from a long-term path of cooperation within a machinery co-op or a study group, joint rotation may be seen as a new step to pool more means between farmers. Generally created by a small group of farmers, the members decide to collectively manage the whole or some of their fields together and to reason the whole, as if it constituted one single farm.

In 2006, an agricultural law of a neoliberal government authorized corporate forms to strengthen joint rotation and other joint farming ventures. These were promoted by some agricultural think tanks to enable scale increase through the sharing of skills and specializations (Séronie and Boulet, 2007). According to some researchers, the new legislation aimed to support entrepreneurial ways of farming and then represented a step backward, with the priority given since the 1960s to favoring family farming and the establishment of new farmers by inhibiting excessive land concentration (Cochet, 2008; Mundler and Rémy, 2012).

### Increasing delegation processes

Half of the French farms currently call upon contractors' services for production. With little public support, contractors progressively enlarged their services, in a climate of increasing labor shortage in agriculture. For twenty years, a new kind of contractor has emerged, especially in arable farming regions, to provide the complete outsourcing of agricultural work (from plowing to harvesting) and other tasks such as accounting (Anzalone and Purseigle, 2014; Harff and Lamarche, 1998).

Despite that, machinery and labor-sharing arrangements between peers continue to persist. Being in full control of the production process and defending his/her autonomy are key motivations for many French farmers to prefer cooperation rather than delegation (Lucas and Gasselín, 2016). Emery (2015) observes a similar phenomenon in the UK. Despite an increase in the contracting business, some farmers prefer to share machinery with peers to maintain control over the farm practices.

## Renewal of cooperation in multifunctional agriculture

Heterogeneity is now a significant feature of French agriculture (Gasselin et al., 2015; Lémery, 2003). Diversification and multifunctionality emerged during the 1980s as consistent strategies allowing farmers to tackle economic difficulties and avoid scale increase. Similarly, pluriactivity is an increasing trend with more than 15% of French farmers (Laurent and Rémy, 1998).

### Cooperation in organic farming

Nicourt (2013) shows how the first developments of organic farming may have increasingly individualized farm work. Their frequent social isolation among conventional farmers may have limited possibilities of daily cooperation with peers. They generally tend to participate in regional study groups to share their experience with other organic farmers.

Nowadays, organic farmers tend to involve themselves in new forms of cooperation with peers, particularly for those who develop farm processing and direct marketing. This tends to diversify their on-farm activities, and then to reconfigure their work organization. To avoid competition between the production, processing and trading tasks, cooperation emerges as a possible way to share some investments and activities (Nicourt, 2013).

### Diversification

The first collective farmers' shop was organized in 1978. Ever since, there have been more than 200 farmers' shops, and diverse modes of cooperation for marketing activities have emerged. In the early 1980s, the first machinery co-ops were created to share processing workshops and facilities: there are more than 130 of such workshops today in France (Mundler et al., 2014).

Organic study groups, Civam and other alternative study groups play a significant role in their emergence. They are often the arena that reveals a common interest among farmers, from which a common project is collectively considered and built. Because of the disengagement of the State from agricultural extension, Chambers of Agriculture have decreased their support for study groups. Simultaneously, the network of Civam, initially created to promote modern techniques, progressively became a network of study groups oriented towards sustainable and diversified ways of farming (Deléage, 2004). Their historically left-wing political positioning contributes to this orientation, as well as their geographical presence in southern France, where the modernization processes faced difficulties in some areas (such as Alpine and Pyrenean mountains and Mediterranean regions).

### News modes of cooperation for agroecology and farmers starting out

To enter agriculture, young people without a farming family face difficulties in accessing land and skills. For ten years, a new kind of cooperative has emerged to allow people to collectively test agricultural activities on small plots or on a farm, with the support of tutors (Chretien and Daneau, 2013).

Since 2013, new agroecological farm policies have made visible new cooperation initiatives (Lucas, 2013). For instance, specialized farming systems seek to cooperate to develop crop-livestock integration. First developed by organic farmers, this mode of cooperation is gradually spreading among conventional farmers (Le Guen, 2016; Moraine, 2015). Other forms of local cooperation are emerging to develop agroecology, such as resource-sharing arrangements (for seed sharing for instance) or collective management to interconnect ecological processes in re-designed landscapes (Collectif, 2015; Sigwalt et al., 2012). Some common key factors explain their emergence such as mutual acquaintance through previous cooperation experiences between the farmers involved. Both formal and informal modes of regulation may be used to regulate the cooperation.

## Some illustrations through case studies

In 2012, a common reflection between farmers' organisations revealed that farmers are often involved in several sharing arrangements. The federation of machinery co-ops now aims to defend diverse local modes of cooperation, beyond just the machinery co-op (Fncuma, 2012; Lucas & al., 2014).

We propose to mobilize some case studies recently surveyed through a research program run in partnership with the French federation of machinery co-ops. This allows us to illustrate the current renewal of modes of cooperation in farm work with some concrete examples from the network of machinery co-ops.

## Methodology

The six case studies were selected to cover different geographical contexts and farming systems. Half of them employ paid workers. There is a broad spectrum of integration in the machinery co-op among the 36 farmer members interviewed: from farmers with few machines of their own and mostly using the equipment of their co-op, to farmers who use half of the equipment they need on their farm through the co-op.

We will present in this section the analysis about the determinants and the principles that guide the management of the diverse arrangements organized by farmers. Finally, we discuss the issue of the diversity of principles identified.

## The machinery co-op embedded in a network of farmers' sharing arrangements

### Diversity of sharing arrangements

Besides using machinery of their co-op, some farmers studied are also involved in co-ownership arrangements with peers, and/or service exchanges. The latter particularly occurs in one co-op with a labor bank to regulate the exchange of services between them. These services may be labor exchanges, equipment lending, and machinery driving or repairing.

These machinery-sharing arrangements are often interlinked with labor-sharing arrangements. We identify the following: mutual help, labor exchanges, joint organization of tasks, pool of employers, labor division by specialization of some farmers with particular skills (for instance for adjusting and fine-tuning a machine), labor bank, common management of a specific operation (for instance harvesting, seeding or haymaking) at the scale of the whole constituted by the fields of all the members. In two case studies, the latter is associated with a risk-sharing mechanism because the operation needs specific weather conditions, implying that all the fields might not benefit from the optimal climatic conditions.

In half of the co-ops studied, the habit of sharing equipment and work has created a trust level that has triggered other sharing arrangements between some members. We identified the following: seed-sharing, crop-livestock integration, and coordinated purchasing pools to buy external inputs.

### Determinants of the involvement in sharing arrangements

Several kinds of determinants explain the ways through which the sharing arrangements are created, maintained, recomposed and renewed by farmers. We identified the following:

- Material and work determinants: these derive from the need to improve the access and management of the equipment and labor.
- Social and relationship determinants: farmers' arrangements may be organized to offer opportunities for socializing, particularly for isolated farmers. Family links or pressure too may facilitate or impose some farmers' arrangements.
- Strategic determinants: sharing arrangement also offers opportunities to be informed about the practices of their peers or/and to promote some of their own practices to the others. This may serve their wish to convince others to collectively invest in a machine that would be particularly strategic for their farm. In this way, sharing arrangements may be a way to practice a form of social control among the peers.
- Cognitive determinants: arrangements may be organized and managed to benefit from opportunities of technical dialogs to share on-farm experiences, problems and questions with peers. In two co-ops studied, farmers with robotic milking seek to repeat opportunities to share experiences with similar colleagues in order to be less dependent on their robot provider.

### Modes of regulation

The machinery-sharing processes involving the co-op equipment are mostly regulated by formal procedures. Half of the co-ops studied delegate the accounting operations either to a paid employee or to an accounting company run by the network of machinery co-ops.

One co-op studied includes a labor bank. The first activity they organized, hemp harvesting, requires the mobilization of many people with different kinds of labor and machinery contributions over a specific period in suitable weather conditions. The labor bank was created to better regulate the diversity of their contributions, and has been used to develop other sharing processes within this co-op.

The other co-ops studied rely on informal labor-sharing processes. The interviewees explain that they are mainly involved in sharing arrangements with peers whose farms are of similar size. If it is not the case, farmers tend to adapt their contribution to balance the labor exchanges. Some of the interviewees refuse to organize a labor bank in their co-op: according to them, this might threaten the friendly spirit that currently prevails within the co-op.

Money is occasionally used, for instance for seed-sharing. This occurs to avoid an imbalance that would make it difficult to continue the sharing dynamic between the farmers involved. Moreover, the delegation processes collectively activated by the co-ops studied frequently rely on mutual acquaintance with the partners involved. For instance, the paid workers employed through the co-ops and pools of employers are mostly people belonging to the family of one of the farmer members, or pluriactive farmers involved in the co-op.

### **Symbolic dimensions**

Symbolic dimensions also occur in the social interactions. For instance, several interviewees related cases of accident or illness that prevented them from working on their farm. The mutual acquaintance of each farm within the co-op allowed them to be easily replaced by their colleagues. Another example: some farmers contribute much more than others to the sharing process. They are often farmers with mechanical skills who repair for the co-op, even have self-built a machine. Their over-contribution is explained by the mutual social consideration they receive from their colleagues, whom they would not benefit by only working on their own equipment.

### **Discussion**

The current renewal of cooperation in farm work by the farmers studied reveals diversity, partly because each arrangement is specific to the socio-technical conditions of each co-op. Despite this, a double hybridization emerges as a common feature. On the one hand, the reciprocity principle intertwines with management and technical rationality. On the other, the formality intertwines with informality.

This was also identified by researchers working on sharing arrangements in developed countries. In a survey of crop-livestock integration arrangements in France, Le Guen (2016) emphasizes the informality of the exchanges of products and labor combined with the formality of the exchanges of machinery. In Denmark, the environmental regulations give rise to manure partnerships among farmers. These are mostly organized between farmers who know each other and barely managed as economic opportunities. Self-governed agreements are organized without using money to informally share the costs in a balanced way (Asai et al., 2014). These French and Danish authors also notice that the mediation of agricultural advisors is mainly accepted to assist in matching farmers and facilitating agreements in such a way that they will be able subsequently to organize themselves autonomously.

### **Conclusion**

For a long while, numerous processes in French agriculture have aimed to renew cooperation in farm work on a formal and entrepreneurial basis. Yet, a diversity of modes of cooperation currently persists, and informality often intertwines with formality within the same mode of cooperation. Currently, this is a significant trend in France and in other developed countries (Cornée and Rousselière, 2016), which coexists with processes of commoditization that are increasing worldwide in the organization of agricultural production.

We also relate the renewal and characteristics of these modes of cooperation in the pursuit of autonomy sought by farmers in relation with markets and providers of agricultural services (Lucas & al., 2016). Cooperation then represents a way of resisting external prescriptions and pressures, by being structured in a pragmatic way to be simple to manage and to avoid intermediaries. This converges with other research works which have also identified cooperation in farm work, as one of the ways for farmers to develop autonomy (Le Guen, 2016; Ploeg, 2008; Schneider and Niederle, 2010).

However, local cooperation in farm work is a barely visible phenomenon in France, including at the local level. Among others, informality contributes to their absence in statistics and in the scope of farming policies. This partly explains the few existing studies on this topic. Farmer organisations such

as federations of study groups or machinery co-ops face difficulties in renewing their action to network and facilitate the diversity of current existing modes of cooperation in farm work. These national organisations were mainly shaped during modernization processes and were used to discussing with the State to guide their action. In a context of heterogeneous farmers some of whom seek to develop autonomy, the grass-roots nature of the current renewal of cooperation strongly questions the work of farmer organisations, who were nationally institutionalized.

Academic contributions are expected to help develop better understanding of this phenomenon. Especially as cooperation in farm work is newly considered as an important tool to allow farmers to tackle challenges such as climate mitigation, ecological transition, food systems redesigning and economic viability (Duru *et al.*, 2015). However, in the existing studies on this topic, the persistence of reciprocity and informality generally remains a “black box”. This reveals the need for cross-disciplinary research on this complex topic, combining farming system approaches with history, economy, anthropology, ergonomics and sociology. Simultaneously, the pursuit of autonomy claimed by farmers has to be examined, especially to nurture reflections regarding the role of professional facilitators.

## Acknowledgements

This study is based on a research funded by the French Ministry of Agriculture (2014-2016 CapVert Project and 2016-2019 Luz'Co Project). We would like to thank the farmers interviewed for participating in our research and the national network of farm machinery co-ops for their support.

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