Research Article

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Forms of territorial embeddedness in dairy value chains

Case of the Chartreuse massif (French Alps): geographical and historical perspectives

<https://doi.org/10.1515/opag-2018-0065>

received June 24, 2018; accepted November 6, 2018

Abstract: The ending of milk quotas marks a breach in the mode of milk supply management. Farmers and actors of territorial development are concerned about the future of dairy farming since we can observe a loss of autonomy and sovereignty in front of agro-industries. In this context a group of dairy farmers in the Chartreuse massif (French Northern Alps) wished to conduct a reflection on their future. It consisted in better understanding the territorial embeddedness of dairy value chains, compared with what could be done elsewhere (geographical perspective), and what has been done in the history of the area (historical perspective). We used a same reading grid based on six criteria relative to the geographic embeddedness of the value chains, the ability of the producers to specify their resources, and to organize themselves and be autonomous. Of the 18 initiatives analyzed concerning dairy products, we identified four types of territorial embeddedness. The history of Chartreuse shows different trajectories of loss and gain of autonomy for the dairy producers and a loss of collective. We discuss the cross-reading of these geographical and historical perspectives and their meanings in terms of territorial embeddedness and for the Chartreuse producers.

Keywords: dairy value chain, mountain area, territorial embeddedness, power distribution, dynamic approach

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1 Introduction

1.1 Local actors losing control over dairy value chains

The milk quota system set up in 1984 was abolished in April 2015, ending 30 years of public regulation of the milk supply. It gave rise to private regulation through contracts between producers and industrial operators. Over this 30-year period, the quota system had helped sustain production over the whole country (Dervillé and Allaire 2014). Outside the areas where there has been a collective organization, typically around recognized high-value-added PDO/PGI (Protected Designation of Origin / Protected Geographical Indication) cheeses, the patterns of change in territories are largely steered by downstream players (Dervillé and Allaire 2014), who are not overly concerned about their impacts or the wealth created at local level. However, the local actors, who are faced with economic and environmental development issues, are concerned about the effects of ending milk quotas on production and are seeking to recover some control over the system (Alpmann and Bitsch 2017; Forney and Häberli 2017). It is generally observed that the autonomy and the sovereignty of farms and production areas are reduced faced to agricultural markets and agro-industries (Van der Ploeg 2008), and producers and small-size firms are struggling to survive. In mountain areas, they are penalised by their topography, climate and lack competitiveness in the world market unless they can produce a product with high added value (Dervillé and Allaire 2014).

In this context, a group of dairy farmers in the Chartreuse massif, with other local actors (advisers of Chamber of Agriculture, elected representative in charge of agriculture at the Regional Natural Park -RNP-...) wished to conduct a reflection on their future.

This took place in an action research project (PSDR¹ Sagacité). The first step was to establish an overview of the dairy sector in the area (Madelrieux and Lescoat 2016). Analysis found that in 2015, the 61 dairy farms had delivered 13 million litres (ML) of milk. This milk went to eight dairies, of which only one – the Entremonts cooperative – was actually located in the Chartreuse. Two thirds of the volume produced left the area. The findings from this initial study were presented locally. The exchange that followed enabled the local actors to realize the diversity and fragmentation of dairy value chains, their dependence on external operators, and that milk collection by private operators was at risk if costs became too high, due to an increasing dispersion of farms. This overview also highlighted tensions between local producers, due to the widening gaps between dairies on milk prices and stability and the fact that local-area cooperatives were approaching critical thresholds in terms of numbers of members. This first step culminated in the collective strategies needed to secure stronger autonomy for producers and more sovereignty in the dairy value chains. Well aware that they cannot hope to compete on mass production and economies of scale in their mountain farms, and aware of the image of their area (a mountain zone with RNP status, set between three major towns, straddling two “départements” – Isère and Savoie), they started to question what could be a project common to dairy farmers, based on “Chartreuse” as a strong but as-yet undeveloped identity, that could be communicated to allow a (re)valuation of their trade, the collective, or even the milk prices.

Here we present a report on the second step of the action research in order to better understand the territorial embeddedness of the dairy value chains in the Chartreuse today, and what it could be tomorrow. The objective was to offer the actors materials for reflection, based on: i) a geographical perspective to analyze local initiatives on dairy products set up elsewhere in France and ii) a historical perspective to analyze the specificities of evolutions in the Chartreuse value chains, their links to the area, and the factors that contributed to federating Chartreuse dairy farming around an “identity” or, conversely, led to its break-up.

1.2 Framework for analyzing forms of territorial embeddedness in dairy value chains

A large bulk of the scholarship on the interactions between agri-food chains and production areas gravitates on food systems localization (Hinrichs 2003) and the quality “turn” (Goodman 2002), such as the deployment of label of origins systems. The concept of embeddedness is widely used in this literature (Deverre and Lamine 2010). It was popularized in economic sociology and by Granovetter (1985) beginning to refine Polanyi’s idea that economic action is embedded in social relations. The concept was then enlarged to question the social but also cultural or ecological relationships of a food system in a territorial context (Sonino 2007; Morris and Kirwan 2011). The aim of local embedded agri-food systems is enabling consumers to make connections between the place of production, the production methods employed and/or the people producing the food (Ilbery et al. 2005). It is considered a ‘way out’ or an ‘alternative’ to the agro-industrial model which is associated with unsafe food, asymmetric bargaining power, weak returns to farmers, and environment degradations (Barिताux et al. 2016).

But Sonino (2007) showed that there is now a tendency in both the conventional and the alternative sector to create products that, at one level, are rooted in a specific territorial context and, at another level, hold the potential to travel to distant markets. Embeddedness can also be “appropriated” by actors operating at the global level to maximize their commercial profit by accessing niche markets. On the other hand Barिताux et al. (2016) showed that localized food systems tend to be perceived as more environmentally sustainable than non-localized systems. However the ways ecological issues are considered vary greatly depending on the actors and systems involved in the projects. These reflections are raising the need to better understand differences amongst food systems, and assess the nature of their territorial embeddedness: the role played by socially-constructed notions of quality and locality and the distribution of power within and between the actors of the agri-food network (Murdoch et al. 2000). Another limitation, according to Sonino (2007) is it does not take into adequate consideration the process through which an economic system becomes embedded. This tendency has often produced a too simplistic classification based on an opposition between localized (i.e. alternative and embedded) and globalized (i.e. conventional and dis-embedded) food systems.

The many papers on agri-food system localization can be collapsed into three types of approach according to the focus they adopt (business strategy, qualification of resources, link to consumers):

¹ This research is part of program Pour et Sur le Développement Régional (PSDR): For and On Regional Development.

- 1) analysis of business strategies articulating place (Saives, 2002) and spatial competition in a globalized marketplace. The author separates spatial behaviours of companies into different types: (i) localization-driven behaviours, which relate to the environment chosen for the firm and revolve around access to inputs and/or consumer markets, and (ii) territorialization-driven behaviours, which consist in developing resources connected to the place. This can lead companies to activate and specify territorial resources.
- 2) analysis of these processes of territorial resource building from the valorization of agricultural products, to the setting up of coordination arrangements, eventually with public actors and institutions (Landel et al. 2014), including the processes of territorial qualification of food products (Ilbery et al. 2005). Several dimensions are taken into account as the extent to which food supply chains use local resources (e.g., soil, breeds, skills and knowledge, processing units, retail outlets), or the extent to which local actors and stakeholder organizations are involved (Roep and Wiskerke 2012).
- 3) analysis of the links between production and consumption, through the qualification processes (Goodman 2002), the analysis of socio-spatial proximity between producers and consumers (Hinrichs 2000), or the extent to which the values, codes, and rules that represent the food product and the chain through which it is produced are shared by the wider network of stakeholders, consumers, and society in general (Roep and Wiskerke 2012).

For conventional commodity value chains, there is little scholarship addressing their organizational structure as lock-in or lever for a (re)localization and diversification of agricultural productions (Meynard et al. 2018). Some authors are starting to trace the path of 'local' and its meaning in conventional food systems (Forney and Häberli 2016). Understanding the forms of value chain/place interactions is particularly important for long and conventional food supply chains whose "territorialization" has been understudied (Madelrieux et al. 2017). The "embeddedness" concept offers a grammar with which to read these value chain/place interactions without being restricted to label of origin or short supply chains.

Here, we propose to consider three complementary dimensions of territorial embeddedness: 1) geographic embeddedness, i.e. dependency on the natural and socioeconomic environment that supports the resource; 2) capacity of the private and public actors to specify the resource, i.e. to differentiate it by conferring it specific qualities; and 3) capacity of the local actors to self-organize and to become autonomous on the rules they introduce.

2 Material and Methods

2.1 Geographical perspective: analysis of forms of territorial embeddedness

The geographical perspective is based on the analysis of 18 initiatives on dairy products set up in France at a local scale. We did not look for completeness but a diversity of different initiatives as to the nature of the products, the initiative leaders, their scope and number of producers concerned. Note too that the initiatives are recent (post-2006, the starting-point for progressive phasing-out of the milk quota system) and were not initiatives of PDO/PGI labelling, already widely analyzed in the literature (Barham 2003). The initiatives are presented very briefly in the appendix.

Sources were questioned (internet, press, phone interview with a person involved in the initiative) to establish: a state-of-play of the value chain before the initiative; a description of the initiative; the initiative's territorial embeddedness; the future developments. We chose to focus analysis on the value chains from milk production to the marketing of processed products. It is indeed extremely difficult to reliably track the subsequent steps through distribution channels to end-consumer. In order to develop a reading of diversity, we chose to look at this from the standpoint of the producers and their places and autonomy in the value chains deployed. We also translated the forms of embeddedness selected for analysis into a six-variable grid:

- geographic embeddedness, via a variable named "nature of the product" with modalities running from generic (product that could easily be made elsewhere) to products strongly linked to the place with a cultural heritage; and a variable "localization and geographic proximity" of the different value-chain operators;
- capacity of the actors to specify the resource, via a variable "specification of the products" in connection with the existence of specifications detailing product qualities and use of local resources;
- capacity of the actors to self-organize and become autonomous, via the variables "initiators and leaders", "producer autonomy" in the management of the different stages of the processes in the value chain (from production to the marketing of processed products), and "development of a processing unit" in the hands of producers.

For each variable, we established four modalities (scored 0 to 3), translating a rising gradient of embeddedness,

through a process of iteration based on the analysis of the different cases. As this same reading grid also aimed to investigate the trajectories of the forms of embeddedness of dairy value chains in the history of Chartreuse, we iteratively adapted the modalities to the Chartreuse cases, without losing touch with the other 18. This makes it possible to have a common reading grid of diversity (Table 1). To allow types or forms of embeddedness to emerge, we ran a multidimensional analysis based on Bertin's graphical analysis, a graphical representation of cases that amplifies visual cognition (Hostiou and Dedieu 2012), on clusters that visibly stand out from the association of modalities and coloured areas. This allowed us to identify four forms of territorial embeddedness among the initiatives studied (Table 2).

2.2 Historical perspective: trajectories of dairy value chains in the Chartreuse massif

The historical perspective started out with knowledge sharing during a collective timeline workshop. This workshop was designed as a federative highlight, borrowing methods and postures from companion modelling (Etienne 2011) around tools conceived to share knowledge between farmers, advisors, elected representative and researchers. The structure of the timeline is a familiar format that allows information to be visualized and shared by all. In this case, the timeline axes mapped out: the history of the operators linked to the Chartreuse dairy value chains; the types of products these operators make from Chartreuse milk; the forms of farmers' organizations; the events, socio-economic shifts, legislations and policies that have had an impact on the local development of milk production and value adding.

Working up from the knowledge and grey areas (omissions, hypotheses) that emerged from the workshop, we ran a series of in-depth interviews and a review of archives in order to crosscheck and enrich what we had learned. The further analysis consisted of identifying sequences corresponding to significant changes in the territorial embeddedness of the Chartreuse dairy value chains and characterized by a certain "coherency" in the system (Bergeret et al. 2015). For this purpose, we observed the pattern of change in operators' dimensions (number of members and flows of members), their status, their localization and the links between them. For the different sequences identified, we applied the reading grid (Table 1). It draws out the evolution of forms of territorial embeddedness over time.

Here we propose a non-exhaustive analysis of the findings, focusing specifically on the trajectories of two local cooperatives still present in the area (Miribel and Entremonts), and another trajectory where producers are associated with operators attached to groups of international dimension, located outside the area.

Ethical approval: The conducted research is not related to either human or animal use.

3 Results

3.1 Geographical perspective: diversity of forms of territorial embeddedness

The Bertin graphic analysis of the 18 initiatives is reported in Table 2. The most discriminant variables (the two first lines of Table 2) are: producer autonomy in the management of the different stages of the processes in the value chain, and producer role in launching the initiative. The variables that contribute least (the two last lines) are localization and geographic proximity of the value-chain operators. Indeed, certain strongly territorialized initiatives can still subcontract - to an operator outside the area - operations like bottling milk, whereas milk is only one of the products in a wider range.

3.1.1 Type 1: producers with autonomy but on poorly embedded products

This type corresponds to the initiatives demonstrating the strongest degree of autonomy and control by the producers of the value chain set-up. They are at the origin of the project and drive each stage of the production and value-adding process. However, the cases can be differentiated on the basis of whether producers invest in a new processing unit (cases 1 to 3) to make relatively generic products (milk, yoghurt, butter, milk powder). In the other cases, producers share resources (equipment, process, brand...: cases 4 and 5) and are focussed on more elaborated products, such as the invention of a new cheese linked to a local breed. Some initiatives differentiate not in territorial embeddedness terms but with specifications linked to environmental concerns (organic agriculture – OA – label: cases 2 and 6) or health (Bleu Blanc Coeur – BBC – label: case 3). In all cases, the initiative boundaries are at local scale, at most departmental.

Table 1: Variables and their modalities used to analyze the forms of territorial embeddedness

	0	1	2	3
<i>Nature of the products</i>	Generic – milk	Generic – fresh products (raw milk, yoghurt, desserts as ice-creams)	New cheeses (possibly inside a wider range of products) or “traditional” cheeses not benefiting from a label guaranteeing the origin	Cheeses qualified as “traditional” and benefiting from a label guaranteeing the origin (at least one in the range)
<i>Specification of the products</i>	No specification standards	Specifications that are ‘non-territorialized’ (OA, BBC, consumer brand, specific to the project) or referring to spatial constraints (mountain area)	Specifications associated with a PGI/PDO but with poor requirements on the use of local resources and inputs or Product associated with a rare local breed	Specifications associated with a PGI/PDO but with high requirements on the use of local resources and inputs or with poor requirements but strengthened by other specifications (e.g. all-hay system)
<i>Initiators and leaders</i>	Processors. Potentially a partnership between two levels of the value chain outside dairy farmers (e.g. dairy–processor)	Partnership PG–SC (alone or under a consumer brand) or PG–processors	Partnership PG/Processors/SC	PG (alone or with a citizen association or public / parapublic partners)
<i>Localization and geographic proximity</i>	There is at least one value-chain operator outside a “regional” scale	All the value-chain operators from production to marketing are at a “regional” scale	All the value-chain operators from production to marketing are at a “departmental” scale	All the value-chain operators from production to marketing are at a “local” scale
<i>Producer autonomy</i>	The producers handle only the production stage, and have no decision-making and bargaining power over other value-chain operators	The producers handle only the production stage, but have some decision-making or bargaining power over other value-chain operators or The producers handle several stages in the value chain, but have no decision-making/ bargaining power over the others	The producers handle several stages in the value chain, and have some decision-making / bargaining power over the others or The producers handle all the stages from production to marketing for most of the products but are dependent on external operators as they do not manage to process all their milk or do not have enough cheese-ripening capacity	The producers handle all the stages from production to marketing
<i>Development of a processing unit</i>	No Maintenance work and minor improvements	Arrangements of existing buildings/upgrading Pooling resources (equipment, process, brand...) between producers	Construction of new annexes (ripening caves...)	Construction of a new processing unit (generally with help of local or regional collectivities)

PG: producer group SC: supermarket chains OA: certified organic agriculture BBC: Bleu-Blanc-Cœur (approach of nutritional and environmental interest)

Table 2: The Bertin graphic analysis of the 18 initiatives

Case	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Autonomy	3	3	3	3	3	3	3	2	2	2	2	1	1	1	1	1	0	0
Initiators	3	3	3	3	3	3	3	3	3	3	3	2	2	1	1	1	0	0
Processing	3	3	3	1	1	1	1	3	2	3	3	0	0	0	0	0	0	0
Nature	1	1	0	2	2	1	1	3	3	3	1	3	3	0	0	0	1	1
Specification	3	1	1	2	2	1	1	3	3	2	1	3	2	1	1	0	1	1
Localization	2	3	2	3	3	3	2	0	0	0	0	2	0	1	0	0	2	2
Total	15	14	12	14	14	12	11	14	13	13	10	11	8	4	3	2	4	4
Type	Type 1							Type 2				Type 3					Type 4	

3.1.2 Type 2: producers with their own processing unit to cut free from downstream operators

This type also corresponds to projects that producers have initiated. Nevertheless, they have not yet gained entire control of the value chain. Either they do not manage to process all their milk and so remain dependent on milk sales and thus on milk price volatility or they do not have the maturing capacity for all their cheese. To get more milk processed, they expand the range of products they sell. It leads them to use subcontractors as they are not equipped for all steps of processing and packaging. That said, the objective is still to become as autonomous as possible from downstream operators and to rely on products rooted in a geographical identity tied to a place and sometimes also to a breed of cattle. Case 11 takes this direction, having started with milk, then developing a range of yoghurts and now looking at making typical cheeses of the region.

3.1.3 Type 3: producers in partnership with processors and/or distributors: proximity and solidarity

This type corresponds to projects initiated by joining forces and setting up a partnership between a producer group and a processor, a distributor, or both. The producers thus relinquish control over processing and marketing but they do have some negotiating power tied to the contract arrangements in place. There are cases where: i) the processor has a pivotal role connected to the nature and specific character of the product, corresponding to PDO cheeses (cases 12 and 13); ii) the pivotal role is centred more on producers and distributors with the development of a milk brand linked to a consumer brand or highlighting proximity and solidarity with producers (cases 14 to 16). None of these cases involve producers developing their own processing capacity, and sometimes they use operators located outside the region, for bottling in particular.

3.1.4 Type 4: producers benefiting from processor-led projects

This type corresponds to initiatives that are not led by producers and where they do not even have negotiating power. These initiatives have, however, a territorial dimension, through the processor's geographic proximity with the dairy producers, and their organization as producers who sign up for the initiative accept to observe the processors' requirements (i.e. OA specifications in

both cases 17 and 18) and thus get better value for their milk. The product image and its added value seem to promise a future for these initiatives, which concern fresh products (yoghurt, ice-cream) and scope at a sub-departmental scale.

3.2 Historical perspective: contrasting trajectories in Chartreuse dairy value chains

The historical perspective revealed contrasting trajectories with hybrid patterns inside the area (Figure 1). This characteristic can be explained in part by the fact that the Chartreuse shares a culture and history with both Isère and Savoie "départements". The Chartreuse participates both in the Isère history of building a major cooperative movement: the ORLAC (Alavoine-Mornas and Madelrieux 2015) based on conventional milk and fresh products, and the Savoie tradition of "fruitières", local cooperative making specified cheeses with high added value and control of the value chain.

3.2.1 The Miribel trajectory

Biographic timeline

- 1) The cooperative was founded in 1931 and started with 118 producers and a processing unit, placed under indirect management and regularly modernized. It reached a peak of 234 producers in 1954. Processors were chosen mainly on the basis of milk price paid rather than on concern over the type of product (Emmental cheese, yoghurt, fresh cheese, fresh milk...). There have been periods when the milk was sold to operators that did not use the cooperative's facility.
- 2) In 1986, the 105 cooperative members refused to accept the milk price cuts proposed by the processor and decided to switch to direct management. They joined the Union du Guiers, which federates four cooperatives around marketing and ripening caves, in which they invested 2 millions francs. The Miribel cooperative with four others cheese makers and farm-produced cheese producers, created in 1987 the "Chartreuse Cheese Group" to promote a "mountain provenance" indication and a "Chartreuse" geographical reference. They benefited from the support of the local development committee and the Isère Chamber of Agriculture. Production processes were defined for different cheese. The motion gained official seal by ministerial order in 1993. The farmers of the Miribel cooperative experienced the years of direct management as a difficult period. It

Figure 1: Timeline of the Chartreuse dairy value chains

required investments, a lot of time and skills to manage milk quality issues, transport logistics, relationships with commercial intermediaries and customers, and product communication. In the early 1990s, the processing unit needed to be renovated and brought up to hygiene standards. The cooperative asked for public support but did not get it.

- 3) In 1995, as no operator accepted to go on, the cooperative which had about 50 members became a milk selling cooperative. A contract was signed with ORLAC, already present in the area, to collect the milk and process it into UHT milk and yoghurts.
- 4) In 2009–2010, when the milk crisis hit, five producers left for the Entremonts cooperative, which was short of milk, due to better milk prices, price stability and similar farming practices (milk produced from grass without silage). At the same time, ORLAC refused to renew the contract with the Miribel cooperative. The cooperative finally managed to find and sign a deal with the Fromagers de Ste Colombe (belonging to the Italian group Granarolo) producing St Marcellin cheese.

Trajectory of embedding and disembedding

Applying our classification of forms of embeddedness for each of these four periods (Table 3), the trajectory that emerges shows a gain of autonomy with the move from indirect to direct management. Type 5 was created to account for situations of vertically-integrated supply chains in which producers are only milk deliverers and have no more control over the value chain, not even the price at which they sell their milk. In 2009, whereas they

were not looking for autonomy, empowerment came to them when they signed a contract with a processor producing a PGI cheese. As the Chartreuse producers are the only ones supplying PGI milk to this processor, who processes all the milk and has demand for more, they are empowered to renegotiate the milk payment scales, including a PGI premium (type 3).

3.2.2 The Entremonts trajectory

Biographic timeline

- 1) The cooperative was founded in 1935 and developed a processing unit that was placed under indirect management. During the 1970s, village-scale cooperatives disappeared in the area. In 1986, with the new milk quota measures, and only 850000L of milk, the Entremonts cooperative was struggling to find a cheesemaker.
- 2) In 1986, the producers choose to keep their autonomy, and decided to take back control, via direct management, the objective being to collect all the milk from the upper Chartreuse. The managers of the cooperative, numbering 30 producers, rallied to their cause another 10 producers, up to 1,3 ML in 1990. The cheese facility was renovated in 1986, then bring up to hygiene standards in 2000 and the cooperative reached 2,3 ML. When they were joined by the Isère dairy farmers from the Miribel cooperative, they could no longer sell their cheese as Savoie PGI, since these last were not in the PGI area. From the 2000s, they were able

Table 3: Trajectory of the Miribel cooperative

Variable	Indirect management (1931–1985)	Direct management (1986–1995)	Sale cooperative under contract with Sodiaal (1995–2010)	Sale cooperative under contract with Ste Colombe (2010–)
Autonomy	1	2	0	1
Initiators	1	3	1	1
Processing	3	2	0	0
Nature	1 or 2 (according to cheesery)	2	1	3
Specification	0	3	0	2
Localization	2 or 3 (according to cheesery)	3	1	2
Total	8 / 10	14	3	9
Type	Type 3	Type 2	Type 5	Type 3

Table 4: Trajectory of the Entremonts cooperative

Variable	Indirect management (1935–1985)	Direct management and dependency (1985–2009)	Direct control and autonomization strategy (2009–)
Autonomy	1	2	from 2 to 3
Initiators	1	3	3
Processing	3	2	2
Nature	2	3	3
Specification	1	3	3
Localization	3	2	2
Total	11	15	15-16
Type	Type 3	Type 2	Towards type 1

to expand and modernize the cheesemaking facilities supported by the Community of Communes. In 2003 they improved their retail sales with the creation of the store SICA du Granier, the cooperative's second biggest client. The cooperative not having sufficient ripening and retail capacities, the biggest client is a cheese-ripening, who accounted for 50% of the cooperative's sales in 2015, and who held trademark rights for the cheese "Le Chartreux".

- 3) From 2009, the cooperative tried to become more self-autonomous, chiefly to address the over-dependence on the cheese-ripening. The cooperative registered two trademarks in 2012. In 2014, the 26 members produced 4,3 ML of milk, and the cooperative hit saturation point. Two thirds of the milk collected came from the Isère area. However, the producers continued to stick to the PGI specifications and asked for a revision to include the Isère side in the PGI area. In 2014, the cooperative obtained the Chartreuse RNP brand for its cheeses. The cooperative kept on developing with the digging of ripening cellars in 2016, with the support of local authorities. Despite this investment effort, the cooperative, which now produces up to 500 tonnes

of cheese, is still dependent on external operators for ripening and marketing. The producers also joined the PGI Raclette de Savoie in 2017.

Trajectory of strengthening control over the value chain and its territorial embeddedness

Table 4 gives a sharper picture of this gain of autonomy trajectory running through the switch from indirect to direct management, then through a phase of direct management with over-dependencies followed by moves towards autonomy. This trajectory is, however, guided by a wider cooperative network, local authorities, and the RNP.

3.2.3 Trajectory of other Chartreuse value chains: loss of territorial embeddedness

For the rest of the Isère-side Chartreuse, the trajectories follow diverse directions due to the fact that there were less local cooperatives. While some producers worked with private family businesses (the Chartrousin for example), until they got bought out at the beginning of the 2000s by bigger groups (Etoile du Vercors then Lactalis), others

helped drive the ORLAC cooperative movement at regional scale (Table 5). We only present the latter in the following.

The end of the ORLAC cooperative movement in the Chartreuse

The producers oriented towards the Grenoble basin participated in the construction of the large cooperative movement of ORLAC. The story started in 1942 with the creation of a small cooperative in Grenoble collecting milk from the foothills of the surrounding mountains, creating its own processing unit in 1951 and naming itself “Dauphilait” (see Martin-Joël 1962 for details). In 1961, it joined forces with other regional cooperatives to found the ORLAC (regional dairy cooperatives organization). In 1966 a new and big processing site was created at Vienne. The group then associated with Sodiaal in 1990 for its processing and marketing activities, at national level, before the group restructured and reformed as a single cooperative, under the Sodiaal banner, in 2000, a process completed in 2007.

During the 2000s, the local union branch of ORLAC was unhappy with the pricing policy of the cooperative, which was prioritizing industrial expansion. The members lost confidence, and a group of thirty producers decided to leave. The Etoile du Vercors dairy supported the producers through this phase, before welcoming them. The Etoile de Vercors produced St Félicien and St Marcellin cheese but was bought out by Lactalis in 2011. The Chartreuse producers thus lost autonomy but gained in specific character of the cheese processed. However, not all producers signed up to the St Marcellin specifications, which require pasture grazing. The milk is not entirely processed into St Marcellin cheese, as PGI milk supply exceeds demand. As the PGI premium depends on milk volume processed into cheeses, the value-added is not always guaranteed.

4 Discussion

4.1 Concerning the method

4.1.1 Crossing geographical and historical perspectives

Roep and Wiskerke (2012) showed that initiators of new food supply chains usually lack the required experience and expertise for continuous evaluation and reflection. They are often too dedicated and too deeply involved to distance themselves from their own practices and to learn from the success and failures of other initiatives. Our geographic perspective proposes such a wide repertoire of food supply chain initiatives. It aimed at offering additional support to practitioners by jointly evaluating and reflecting on their practices and by mirroring themselves against other initiatives, ultimately to be better equipped to decide on how to proceed (Roep and Wiskerke 2012). Therefore this perspective offers a snapshot at time *t* (inquiry at late 2016 - early 2017). It presents the case at one step of an ongoing process. For instance, in the initiative 6, the initially local network is now national in scope, or initiative 11 which originally started out on milk but has since diversified with yoghurts and cheeses, to gain greater autonomy by processing the total volume of milk, and with better added-value products. The literature shows that embeddedness is not an inherent and fixed characteristic of local food systems. Actors have to constantly re-define and renegotiate to provide their product with an historic and territorial identity that can be defended through political action (Sonino 2007). The author underlines the process involving a dialectical tension between embedding and dis-embedding forces. In fact, while market requirements are encouraging producers to territorially embed their product in the

Table 5: Trajectory of the ORLAC producers

Variable	Direct management –Dauphilait (1951–1961)	Direct management and loss of control -ORLAC (1961–2000)	Loss of autonomy -Etoile du Vercors/ Lactalis (2000–)
Autonomy	3	1	0
Initiators	3	1	1
Processing	3	0	0
Nature	1	1	3
Specification	0	0	2 or 0 (depending on sign-up to PGI St Marcellin specifications)
Localization	2	1	0
Total	12	4	4 or 6
Type	Type 1	Type 3	Type 5

local, the market also is leading the network to dis-embed itself from the local to increase its output which implies enlarging the boundaries of the local. Embeddedness, then, becomes simultaneously a social, temporal, and spatial process (Sonino 2007). For the author, the adoption of a dynamic approach complicates the notion of embeddedness by highlighting its multidimensional nature and its inherent tensions. Our historical perspective enables trajectory of changes to be captured in detail, but this requirement limits the scope of observation and the number of situations studied. The projection of present-day modalities of territorial embeddedness onto situations in the past remains also a delicate exercise that requires recontextualization through added comment. This is particularly sensitive for issues on product specification, due to changes in legislative instruments/environment, consumer demand, modalities of adding value to products (PDO, PGI, OA, BBC...). However, the first law governing the principle of PDOs in France was instituted in 1919, and the first PDO was given in 1925 to Roquefort cheese. This means that, back in the 1930s, the period from which we started our analysis through the emergence of local cooperatives, the producers could already have played the PDO strategy card.

The crossing of the two types of approach makes it possible to gain in genericity, and to propose an iteratively consolidated reading grid. The trajectories observed in the Chartreuse area can thus be compared with a broad diversity of other strategies and qualified with respect to the “types of territorial embeddedness” that we managed to draw out from this diversity.

4.1.2 Viewpoint guided by producers’ perspectives

To characterize the forms of territorial embeddedness, we oriented our analysis around the viewpoints of “producers” and their role/autonomy/control in the value chains. If we had taken a different set of viewpoints – e.g. of institutional actors – we would have had a different reading. We also left aside individual dairy initiatives in the Chartreuse. These choices are related to our action research on collective dynamics, with the Chartreuse producers. This same viewpoint also guided the choice of variables selected for the typology. We focused on the producers’ capacity to specify resources and self-autonomy rather than on time and money resources required by the initiative (which are nevertheless partly integrated in the “processing unit” variable) or on the weight of public funding and institutional support. However, these points were detailed in the description of the initiatives, and we

were able to present them during the meetings with the producers.

4.2 Concerning the knowledge produced

4.2.1 Dairy trajectories between globalization and territorialization

Concerning reconfigurations of dairy basins, Napoleone et al. (2015) showed how they are pushed by the double movement of globalization and territorialization. Concerning globalization, we find cases in the Chartreuse area where the trajectories are pulled by the agro-industry movements, with its vertical integration and internationalization, even in cooperatives (Barraud-Didier et al. 2012). In the ORLAC trajectory we have seen the limit of engagements in a cooperative that grew to become a big industrial group, in competition with private-sector groups, and where the bargaining power that the producers once had as cooperative members had eroding fast (the Chartreuse producers finally leaving the ORLAC). Furthermore, because of agreements between big groups, the producers loose visibility over what happens to their milk in real-time (Alavoine-Mornas and Madelrieux 2015). Other trajectories are framed by a strengthening of territorial movement, as the Entremonts trajectory.

However, a risk is to propose a binary understanding of dairy basin evolution by opposing economic (i.e. capitalism) to not only economic endeavours (e.g. alternative networks), which challenges the hybridity perspective (Forney and Häberli 2017). Hybridity can be used either to criticise or accept the categories it refers to, and most works tends to confirm the validity of a fundamentally binary categorisation (Forney and Häberli 2017). In the context of farmers’ organisations and agri-food businesses, these authors argue that hybridity would be more useful if applied to all kinds of businesses, corporate or cooperative alike, as a critic of the reality of the categories we generally use to understand the economy of agriculture and food. When we look closer at the various value chains, hybrid strategies emerge. For Chartreuse milk that goes to agro-industry, what gets produced is not all generic and standard but can meet PGI specifications and can even be sold partly locally. Conversely, what gets produced locally can be generic and leave the area, as in the case (that we could not develop here) of the Chartrousin, bought out recently by a big group. Another form of hybridity is when some small-scale dairies (in cases 8, 9 and 10, collecting between 3 and 11 ML) to gain self-autonomy by processing as much

of the milk they collect, not only diversify their product range with more generic products like milk, but also their marketing methods for supermarkets, and making more use of external subcontracting for certain operations (like packaging and bottling milk). Autonomy seems more feasible for smaller processed volumes (as in case 2 concerning 3 producers) or for a relatively unprocessed product like milk in bottle, if the facilities allow it to be prepared (case 3).

4.2.2 Meanings of territorial embeddedness

The initiatives studied aimed at regaining, for the producers, autonomy in the value chain and to reap better value from their milk. The effort to build differentiation, in the cases studied, followed a gradient running from basic marketing up to the manufacture of new territorial resources (Landel *et al.* 2014) and processing unit. For initiatives built around such a new processing unit, the motivations or the induced effects also concerned an increased contribution to the local economy. Public actors can then engage to support the articulation of the local economy and the new value chain. Forney and Häberli (2016) showed how the notion of “local” is built, i.e. how different constructs of “local” are negotiated in initiatives involving producers and how the product is used as a way to reconnect to place. Three forms of embeddedness and expression of local emerge (Forney and Häberli 2016): local as provenance (qualifying the product by where it comes from, but in no way its characteristics, which means it can be a standard commodity); local as origin (qualifying the product by specificities of the place, with roots in traditions, identity); local as proximity and solidarity (where it is a network of local producers, and a more direct link to the consumers that prevails). We find these variations in the territorial embeddedness of the different cases studied. Types 1 and 3 play on provenance, solidarity and proximity. For example, case 14 attempts to play on place-based image, in this case, the mountains. The “mountain” and “Chartreuse” provenance has been a crucial step in the approach of the Chartreuse cheesemakers group, yet it was devised more as an approach targeting origin. Origin better fits type 2 and the approaches adopted by the Miribel (period of direct management) and Entremonts (period from 1985 to today) cooperatives. It concerns initiatives built around traditional cheeses, even if new products were developed to extend the range. Our cases also feature other versions of territorial embeddedness: an origin associated this time not to local cheese but to a local dairy breed (cases 4 and

5). Finally, in certain initiatives, the environment or health dimensions reinforce the origin or add an extra layer to the provenance (type 4) or proximity dimensions, which thus operate not just from consumer to producers or between producers but also from producers to consumers when the producers are concerned with quality of their products and their impacts (cases 1 or 11).

The comparison of the cases confirms also the idea introduced by Morris and Kirwan (2011) of ecological heterogeneity of local agri-food system, which challenges the idea that the re-localisation of food systems supports the development of more environmental-friendly systems. Lamine (2015) shows that the dominant relocalization paradigm in the agri-food systems sustainability literature fails to reconnect food, agriculture and environment issues. She explains this gap in part by the focus of this literature on direct producer-consumer relationships, which tends to neglect a large share of agri-food system agents that are intermediaries between them (processors, retailers, institutions) and the interdependencies. Baritoux *et al.* (2016) underlines three different forms of ecological embeddedness of alternative food system regarding the way ecological practices are associated (or not) with environment protection issues : explicit highlighting of practices and values associated to ecology protection; an highlighting of practices and values associated to ecology through their impact on product quality; and ‘toward ecological dis-embeddedness’. In our cases, we have seen the use of environmental or health label especially when the product cannot be linked to a tradition, a cultural heritage, or an emblematic place or landscape. It can help to differentiate and answer consumers’ requirements about quality of the products and their wider impacts, when initiatives multiply. This is the case for instance for the UHT milk segment, where each distributor sets up its own ‘local’ brand. It can also be an attempt, for producers, to build a differentiated identity for their network, grounded on the special connection with the land or the place that members of the network share (Sonino 2007), even if it is not yet recognized by other. In other cases, even if modes of production are environment-friendly, the different operators of the value chain can be distant from each other, which have an environmental impact by the generated flows (case 8 or 9). And others could better value an un-promoted link to the environment (case 1).

4.3 For the Chartreuse dairy farmers and other local actors

The process of co-constructing the timelines and discussing other local initiatives helped create new ties between farmers, by: stimulating a collective dynamic when the local actors in charge of agriculture had neither the time nor the resources to lead this kind of diagnostic inquiry and dialogue; overcoming the tensions between the Miribel cooperative members and those who left for the Entremonts; fostering mutual knowledge between dairy farmers who rarely if ever share time together; and re-appropriating a common heritage, a story that can be shared and passed down to the younger generation and stimulate reflection and action, around a “Chartreuse” identity, beyond the diversity of the local production systems.

Our approach also made it possible to put current difficulties into wider perspective by showing: i) the similar difficulties faced in the past and the collective efforts that managed to overcome them, and ii) the panel of actions possible today to improve producer autonomy. It enabled the producers to gain a more concrete idea of what it means to set up a collective dynamic for adding more value to their milk. It revealed the importance of having real leaders to initiate and drive the projects, dairy farmers who are engaged, who have ability and skills to carry out business strategies and to entrust reliable partners, who are capable of mobilizing public and private actors and to deploy major communication campaigns (crowdfunding like in case 3, animations in supermarkets, etc.). And we can note that the initiatives often materialize through support from local authorities, chambers of agriculture, other institutions, and more recently from civic society. For Roep and Wiskerke (2012) the challenge is finding and maintaining a proper balance between governance, embedding, and marketing in the development of food supply chains. And for Sonino (2007) it is about reaching and maintaining a balance between quantity and quality and between collective needs and individual wants. This framework could be a reflexive tool for practitioners to help them positioning themselves, developing their project (strategy, partners) and skills, building the capacities that they need, and come back to it regularly.

5 Conclusion: how to “catch up” the (hi)story?

The story of dairy production in the Chartreuse or other areas swings between embeddedness and dis-

embeddedness, dependencies and autonomization. These changes may be imposed top-down, when driven by the concentration of downstream operators, and may result in loss of autonomy and producers pushed away from decision centres. Although some of these same changes can lead to new opportunities, as seen in the case of the Miribel cooperative. But these changes may also be initiated and driven ‘bottom-up’ by producers to defend against top-down changes. This all translates into different expressions of territorial embeddedness. Territorial embeddedness can be utilized to create alternative systems that incorporate social, environmental and health issues into the production and consumption of food or to valorize local assets and to provide options for marginal areas (Kirwan 2004). As evidenced from the cases, many farmers see the involvement with the new value chain as a strategy to leave behind conventional agriculture and to regain power and control over their productive relations. In this respect, as said Sonino (2007): “it also shows that the agri-food literature should not just confine itself to debates about whether or not embeddedness creates a “real” local context or a romanticized image of it and whether or not this local is a product of parochial “defensive” tendencies, as some may argue. Initiatives of this kind also have much to say about producers’ strategies to remain in business and stay on the land”.

In the Chartreuse, the lines of this expression remain blurred. The geographical perspective served to scrutinize the collective initiatives on dairy products, and as things stand in the Chartreuse, the local actors are just not ready to mobilize for a new processing facility that would process all the Chartreuse milk. The project for a Chartreuse-branded milk was also undermined by the knowledge of the multiplication of initiatives of this kind without any real added value. The local actors are now focusing on bringing the two local cooperatives together around the two value chains, which would remain separate (the St Marcellin value chain and the PGI cheeses of Savoie). They are looking at the possible modes of cooperation and governance. However, this rapprochement is a first step that has to synchronize with the reflection on the common shared identity. The historical perspective revealed a diversity of formalizations of what made shared vision and differentiation in the past, but how they will be remobilized and reinvented for the future remains to be seen. The challenge is to avoid the ‘local’ trap (Forney and Häberli 2016). Various studies on localized agro-food systems find a propensity towards “defensive localism” that strengthens social and identity-based boundaries, with little regard for environment and social justice.

Aknowledgements: This research is part of the regional development facilitation program Pour et Sur le Développement Régional (PSDR4) supported with funding from the INRA, the Rhône-Alpes regional council, the Irstea, and the EU under the European Innovation Partnership for Agriculture. We also thank the AgroParisTech students and their supervisor Philippe Lescoat, as well as Fanny Bertrand from Suaci Montagn'Alpes, for their precious help in analyzing the 18 territorial initiatives.

Conflict of interest: Authors declare no conflict of interest.

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Appendix: succinct presentation of the 18 initiatives

Case 1: a whey processing plant set up by an alliance of 9 cooperatives in order to provide the producers (already in a PDO or PGI chain) with a new revenue stream

Case 2: a processing tool and a range of fresh organic produce set up by 3 dairy farmers in a same area

Case 3: a milk packaging tool and a short supply chain set up by a business uniting 20 dairy farmers to no longer be dependent on big groups

Case 4: development of a new cheese to promote and safeguard the future of a local dairy breed by a breed selection organization, and relying on 10 cheesemaker-farms

Case 5: initiative to revive a local dairy breed via a cheese identified with the breed, as part of a project federating 7 dairy farms plus an agricultural high school

Case 6: a network of dairy producers set up to market organic farmhouse products under the same brand and recipes (each producer processes on their own farm)

Case 7: raw milk vending machines set up in a big city by an association counting 4 producers from a nearby zone

Case 8: a processing tool and a range of cheeses -including a PDO cheese- set up by a cooperative of 100 dairy farmers

Case 9: a processing tool, a range of cheeses -including a PDO cheese- and sale stores set up by a dairy farmers cooperative (36 farms in 2011)

Case 10: a processing tool, a range of cheeses -including a PDO cheese- and a sale store set up by a cooperative business uniting 8 farms

Case 11: a milk brand and a packaging tool (with bottling subcontracted out), then a processing tool and a range of fresh produce, set up by a dairy farmers' association (30 farms) linked to the departure of the initial collector

Case 12: partnership between a processor as initiative-leader, a distributor, and producers set up around an all-grass system (for PDO cheeses that do not specify it), for one of the distributor's premium-quality value chains.

Case 13: following the liquidation of a cheese dairy -one of the rare few producers of a PDO cheese- a partnership between the producers, a processing facility acquirer, and a distributor set up around a milk brand and relaunch of the PDO cheese but keeping the old brand

Case 14: creation of a producers association (530 dairy farms) and a milk brand, with subcontracting of the treatment and packaging operations, and in partnership with distributors, in an effort to up-value the milk

Case 15: association between a producers cooperative (50 dairy farms), a distributor, and a consumer brand, in order to guarantee milk collection and a revenue stream to the farmers while meeting consumer-stakeholder expectations, linked to the departure of the initial collector

Case 16: association of 3 big producers in a same area with a distributor, and creation of a milk brand, in an effort to up-value the milk

Case 17: a distributor-led brand of organic products set up in association with one of its processing tool and the nearby milk collection area (25 producers)

Case 18: partnership between a dairy (collecting milk from 40 producers) and a local processor (making organic ice-cream) to sustain outlets