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► **To cite this version:**

Morgane Millet, François Casabianca. Protected Designation of Origin and spatial justice Insights from Ossau-Iraty (French Pyrenees) and Brocciu (Corsica Island). 13. European IFSA Symposium. Farming systems: facing uncertainties and enhancing opportunities, International Farming Systems Association (IFSA). AUT., Jul 2018, Chania, Greece. hal-02734415

HAL Id: hal-02734415

<https://hal.inrae.fr/hal-02734415v1>

Submitted on 2 Jun 2020

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Protected Designation of Origin and spatial justice Insights from Ossau-Iraty (French Pyrenees) and *Brocciu* (Corsica Island)

Morgane Millet, François Casabianca

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Abstract: *Geographical indications have emerged as a solution to overcome the "handicaps" generated by the under-optimal localization of agricultural activities. In such situations, actors involved ought to make choices that should be collectively beneficial. However, the PDO areas often cover a heterogeneous territory with plains, hills and mountains. How do stake-holders deal with this heterogeneity?*

To address this question, we mobilized two French cases of sheep cheese under protected designation of Origin (PDO), Ossau-Iraty (French Pyrénées) and Brocciu (Corsica). The two areas concerning these products originate from strongly heterogeneous spaces, from plains to high mountains. Our goal is to identify choices that favor mountains and hills equitably.

Our results show that the lack of product specification leads to poor milk specification based upon conventional criteria of performance: the most productive farms, located in the plains, are clearly favored. It is particularly visible in Corsica, where traditional land use practices are disqualified and induce a universalist model of grass culture. This reinforces a process that has been ongoing for many years: the contraction of the productive space in mechanized areas and abandonment of the mountainous areas.

However, it is possible to reverse this trend within a PDO, as demonstrated by the Ossau-Iraty case: actors build a set of rules, establishing a new balance between mountains and hills, by setting productivity limits, implementing feeding regulation, and the requalification of grassland resources as well as identifying cheeses originating from higher altitudes (mention : "estives"). They are, moreover, building a new device for stabilization of these two spaces: mountain-plain complementarity, allowing long-term forage autonomy of the area. Therefore, PDOs are not just potential tools for territorial development, the way they are designed may also lead to more spatial justice as a main contribution to sustainable agricultural and rural development.

Keywords: *PDO, spatial justice, specification, equity, sheep cheese*

Introduction

Space is heterogeneous. It is an obvious observation, particularly highlighted when dealing with the dominant development model, and the inequalities that its implementation has strengthened (Delfosse, 2006; Rojas Lipez and Pulido, 2013). Market globalization, product standardization and production models' homogenization have marginalized the less competitive and less productive spaces (Mazoyer and Roudart, 1997). The promotion of local products has emerged as a solution for these spaces, especially in mountain areas (Delfosse, 1997; Margetic, 2005). The creation of geographical indications (GIs) has enabled these regions to be framed and valued, allowing them to develop a local economy based on tradition and quality. Such tools are considered as an alternative to the dominant development model, now in crisis.

Such studies contributed to the development of thinking approaches such as the localized agri-food systems (Muchnick, 2010; Perrier-Cornet, 2009) or alternative food systems (Deverre and Lamine, 2010). The purpose of these theories is to understand the foundation of such activities, and the ability to locally create a system (Fourcade et al., 2010), sufficient to withstand the hazards and, ultimately, become sustainable. However, by analyzing various success stories, many researchers and institutional actors attempt to systematize the relationship between system location, products under GIs, and sustainable development (Deverre and Lamine, 2010; Perrier-Cornet 2009), to such an extent that they fall into a form of "glorification" of the local (Sonnino, 2007).

We believe one threat to the success of these theories is the tendency to avoid the material dimension of such agri-food systems. There is indeed special attention paid to actors, their ability to act collectively, to build shared rules (Frayssignes, 2008; Vandecandeleare et al., 2018). They include also cultural dimensions (how the area is incorporated in the local people's history, how these elements are shared with others), as well as economic ones (how a territory is harnessed and used to create wealth) (Muchnik, 2010). However, little attention is given to the materiality of space, and its impact on these interactions over collective action.

Often the areas chosen as reference for these agro-food systems are considered uniform (Praly et al., 2006; Millet, 2017), however, we would disagree as once more, space is generally heterogeneous, even at the scale of a local agro-food system. Conceiving spatial heterogeneity for space, gives rise to development dynamics of different speed levels, in accordance with the potential of the conforming parts of the area. Our hypothesis is that GIs may offer the opportunity to deal with this heterogeneity and to build a strategy on it. But how do the local actors involved in a GI deal with it?

1. Material and methods

We address this question comparing two cases in mountainous regions where small ruminants constitute a pillar of the agricultural development, one in Corsica (an island in the Mediterranean sea) and another one in the French Pyrenees (a mountainous region in south-west France).

According to the general agricultural census (RGA) in 2010, 500 farms (out of 2,800) in Corsica and 2,000 (out of 12,000) in the Western French Pyrenees are concerned with this activity. Dairy sheep activity is based on the PDO *Brocciu* in Corsica¹, on the PDO *Ossau-Iraty*² in French Pyrenees. Both products can be produced on-farm or in dairy industries. Although these PDOs are not the local cheeses that are the most sold, the majority of local breeders are affiliated, thus complying to their respective production specifications.

¹ Brocciu is a fresh cheese made from a mixture of cooked whey and milk. In 2007, it represented 20% of Corsican cheese (averaging 2 500 tons).

² Ossau-Iraty is a pressed non-cooked cheese, which represents 30% of the local cheese production (averaging 14 000 tons), in 2011.

Land use is diversified in both PDOs' areas, composed of plains, hills and mountains (*figure 1*): mechanization and grass cultivation is possible in some parts, summer pastures are available in other elevated parts.

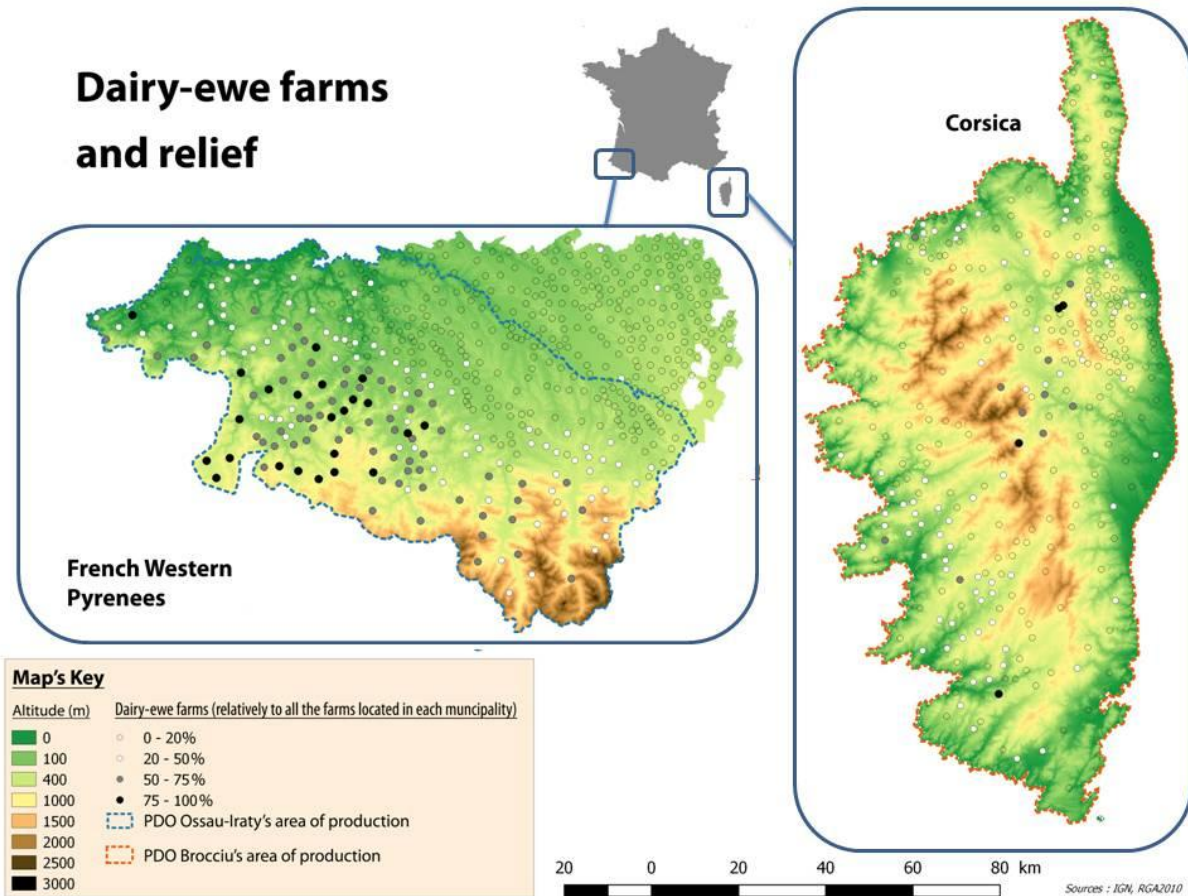


Figure 1: Relative importance of dairy ewes farms in the communes of French Western Pyrenees and Corsica island

Those regions have also been deeply influenced by the Roquefort model, for nearly a century (until the eighties), which can be considered as the translation of the conventional model of production for dairy-ewe breeding (Delfosse, 1992; Rieutort, 1995).

The Roquefort Cheese is an ancient and famous blue cheese produced in the center of France. In the nineteenth century, as it became very popular and the demand grew, the cave owners expanded their production by extending milk collection from the traditional area (the *rayon*) to Corsica island (in 1892) and the French Pyrenees (in 1903). The Roquefort firms would always operate in the same way, using dairies that collect the milk and process it into curd loaves, which would be then sent to the Roquefort area for ripening (Delfosse, 1992). This form of organization remained for nearly a century: the “Roquefort Era”. With the “silent” revolution in the French dairy ewe sector that occurred between 1960 and 1980, Corsica and French Pyrenees were no longer needed for Roquefort cheese production (Rieutort, 1995). Most of the firms left the regions to focus on the *rayon*. More recently (2004), the Roquefort area has been redefined, including only the *rayon*.

Therefore, the French Pyrenees and the island of Corsica constitute a relevant situation, in supporting the understanding of the interaction and tensions, between a conventional model of production and a dynamic of local differentiation based on GIs (both PDOs were recognized in the 80s and registered at European level in the 90s).

The aim of this communication is to analyze how dairy ewes breeding and the associated land use evolved during the last 60 years within both areas. Our scope is to understand the

role of GIs in such evolution. As we previously demonstrated (Millet et Casabianca, 2014), understanding how localised agrifood systems are built requires a processual study.

A large set of interviews has been conducted in order to gather data from the local actors' memory: 34 people in Corsica and 40 in French Pyrenees, both actual and retired producers, extensionists and policy makers. Archive documents and meeting reports provide additional data to be confronted to the narratives obtained³.

2. Results

Through the parallel description of the breeding systems' main evolution and the cheese economy's evolution, we attempt to demonstrate how they are codependent, and how they influence the regions' environment (localization of farms, evolution of land use, etc.). In between, the creation and the evolution of PDOs Brocciu and Ossau-Iraty reinforces and institutionalizes such relation. Concerning our cases, those PDOs do not spontaneously play a role in framing the specific relationship between dairy-ewe breeding and the environment (especially grass lands). This phenomenon is quite recent and heterogeneous from one region to another.

2.1. From the traditional systems to the beginning of “modernization”

2.1.1. Dairy-ewe breeding systems within the French Pyrenees and Corsica

From the beginning of the 20th century, dairy-ewe breeding has been an activity integrated into mixed-livestock breeding farms. The activity is not specialized and only limited to dairy-ewe breeding but also dedicated to produce suckling lamb meat as well as wool. Production is seasonal within both regions: lambing occurs at the beginning of each year, and milk production lasts from spring (March-April) until summer (July-August). Traditionally, the dairy ewe activity is based on grassing, adjusting to its growth through transhumance: herds move down into plains in winter and they go up into mountain pastures in summer. *Figure 2* illustrates the different pathways followed by breeders and their herds in Corsica. During the off-season, they are located in villages (Corsica) or farms (French Pyrenees), located at mid-level altitude. Milk is produced during spring and summer in the mountains. Cheeses are therefore produced out of the milk from mountain pastures, and then ripened on site (Corsica) or at the foothills of the mountains (French Pyrenees).

³ Results presented here are part of a PHD thesis analyzing dairy ewe breeding activities in these two areas focusing on the way these sectors have built the linkage between cheeses and origin (Millet, 2017).

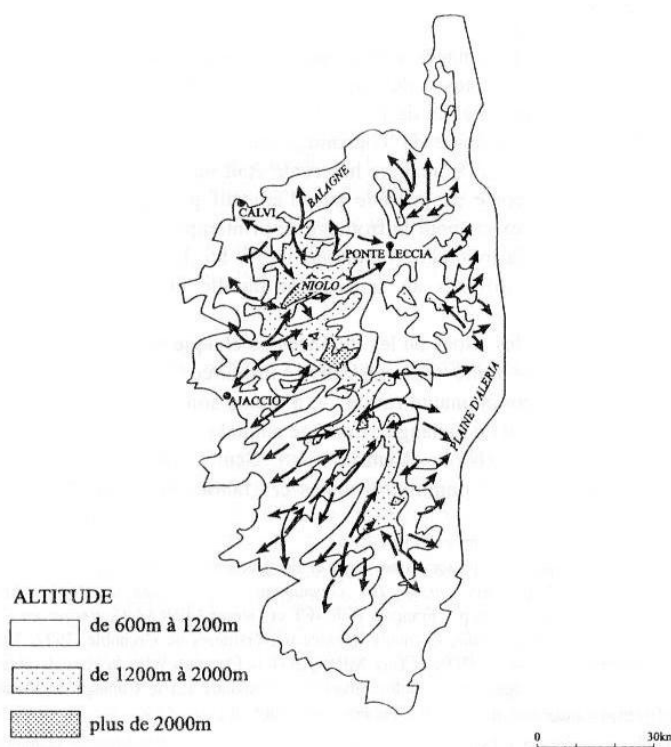


Figure 2: pathways of transhumance in Corsica during the forties and fifties (extracted from Delfosse and Prost, 1998)

During the 20th century, and especially after 1960, dairy-ewe breeding undergo profound changes. Traditional systems have been relying on the availability and considerable amounts of family labor. The economic integration of these regions in the global economy meant the end of the subsistence economy, a countrywide evolution in society as a whole, and a rural exodus, contributing to a drastically reduced labor pool in these regions. This phenomenon weakens the pastoral systems.

In Corsica, grain production for subsistence declines and dairy-ewe breeding is the only activity that continues to be practiced, along with dairy-goat breeding. Flocks of ewes are now occupying the major part of the insular space. Shepherds gradually extend their grazing areas and some settle permanently in plains (Pernet and Lenclud, 1977). However, pastoral pressure remains low, leading to the gradual extension of scrubland (“maquis”), a phenomenon accentuated by village abandonment in the interior of the island. Similarly, in the mountain area, pastures begin to lose their economic value: herds are only moved when ewes are already dried up, so once annual milk production is completed.

From the 1960's, the evolution of the dairy sheep activity is affected by the general development of local agriculture. Corsican sheep farming is directly impacted by a contraction of the available pastoral resources. Pastoral areas have been converted for activities generating higher revenues (such as vine, citrus) although cultivated fodder in plains and grassland in hillsides and mountains remains available. (Guigue, 1965). This competition with speculative activities causes a backflow of 10,000 to 15,000 ewes towards mountains and hillsides of the island⁴ (Poirier, 1988). Transhumance during winter is diminishing in the plains, and the remaining breeders of these areas begin to settle for all year long. Pyrenean dairy-ewe activity does not know such space contraction: it has been much more confined in the mountainous area of the region (*figure 3*). Most of the 325 000 sheep and 5 000 dairy-ewe breeding farms are located in the south of the regions, where natural grasslands are predominant (Gros, 1970).

⁴ According to the authors, the Corsican ewe flock reaches 180 000 to 200 000 sheep in 1960 (Millet, 2017). It reaches 100 000 in 1970. The modernization plan occurring in the sixties has certainly influenced this trend, encouraging the smallest breeders to quit their activity.

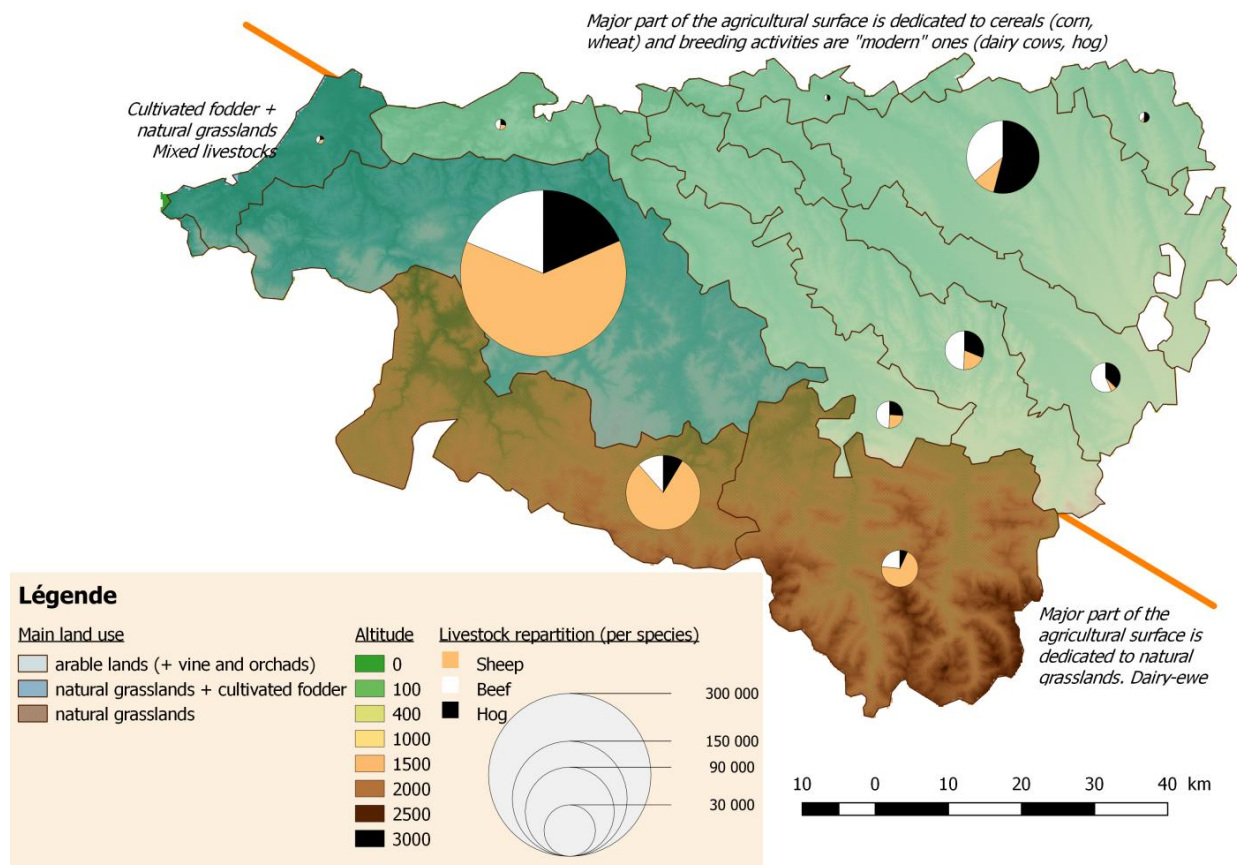


Figure 3: Main land use and regional livestock distribution in the agricultural areas of the Western French Pyrenees (1970)

2.1.2. "Roquefort is the future"

During the agricultural revolution, dairy-ewe breeding in mountainous areas is not a priority for public policy. At a national level, it does not represent an activity of the future as it is not consistent with the French model based on mechanization, productivity and intensification. However, Roquefort industries have been present in the French Pyrenees and Corsica from the beginning of the 20th century. Predominantly located in the plains and hillsides, they collect milk during winter and spring.

Roquefort's success and presence is considered a guaranty for the activity's longevity. However, it has a "price": producers have to "rationalize" their breeding system, in order to produce more and to produce on a longer period of the year. The director of one of those firms claimed at that time: "*Pyrenean Dairy-ewe breeders can increase their revenue: animal feeding, genetic selection, controlled reproduction, earlier lambing, earlier withdrawal too, lactation starting earlier so that all of the milk produced would be delivered, ewes leaving to mountain when absolutely dried-off. This is, I think, the objectives that breeders must and can reach in order to increase the quantity of milk delivered per ewe.*" (Vivie de Regie, 1966-67; p450). Local development organizations and Roquefort firms advocate for an optimization of available resources use by cultivating grass. This should reduce the dependency on seasonal and climatic variable feeding resources and regularize milk production. Such a representation of the feed resource gradually was spread under the influence of professional information, technical assistance as well as through public support.

This trend does not really concern all of the dairy-ewe producers, except the ones who are localized where relief is adapted to such changes: plains and hill sides. Such is the case in Corsica, of the littoral region (figure 4); in French Pyrenees, the hillsides in the center-west of the region (figure 3). In these areas, some groups of breeders are particularly pushing the modernization discourse, and they tend to apply the Roquefort model principles. It is accompanied by the growing importance for shepherds to feed their animals according to a planned diet supplemented with grains and industrial concentrates. Livestock systems are

artificializing pastoral resource into a feeding system based on stocks of fodder and supplements.

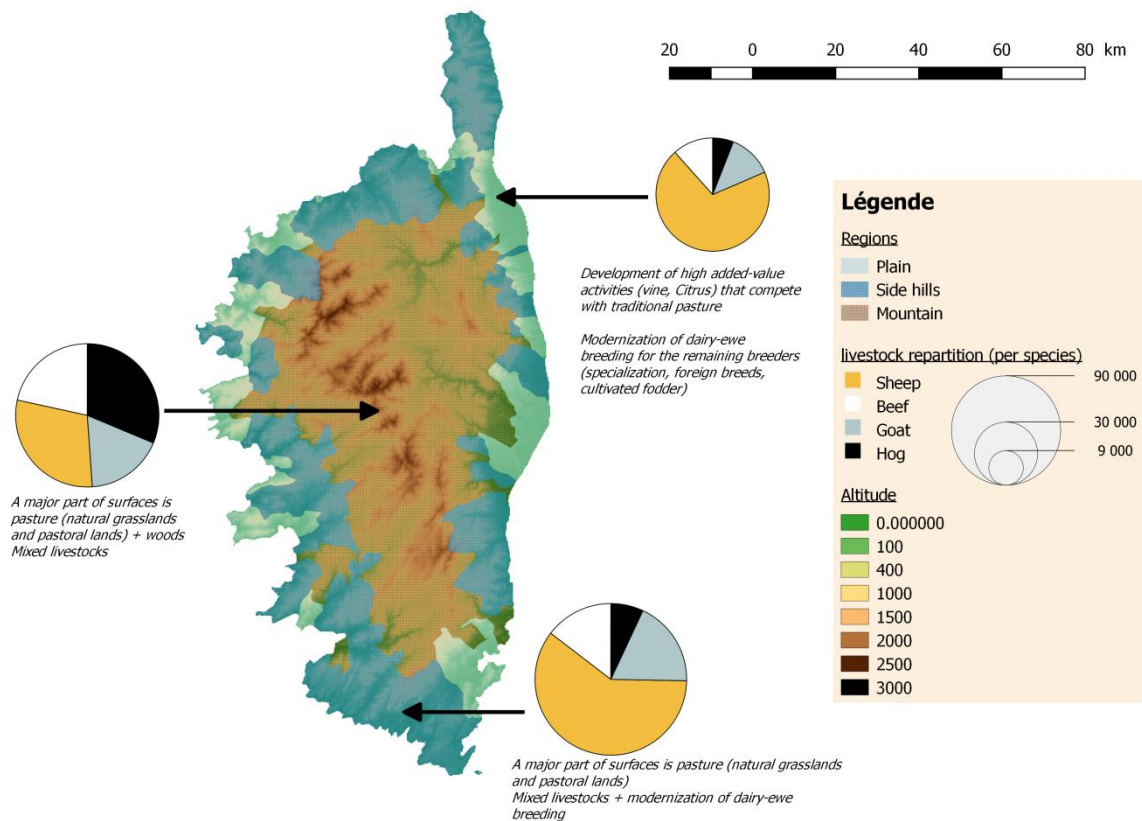


Figure 4: Main land use and regional livestock distribution in the agricultural areas of Corsica (1970)

This situation shows the premises of a two-rhythm, regional development: the hillsides and the plains are privileged areas where “modernization” principles can be adopted, while the mountain areas are seen as where traditional practices are doomed to remain. However, we have to point out that this is just the beginning: relative to other regions of France, “modernization” is occurring slowly, initially based on herds’ hygiene, implementation of fences on grasslands and reproduction control.

Breeding “modernization” is also bound to regional particularities to which breeders have to comply. In the French Pyrenees, farms are quite small and do not permit breeders to increase their flock too much. Consequently, breeders have to rely on mountain pastures to feed their animals. According to the Roquefort model, such resources are not dedicated to dairy production anymore, and, therefore, are considered as no more than a buffer space. In Corsica, most of the breeders do not own the land they use for their herd. Therefore, their capacity to invest in new buildings (shed, sheep pen) or in mechanization (culture or fodder) is quite limited.

2.2. The creation and evolution of PDOs

While Corsican and Pyrenean breeders rely on the Roquefort industry as a guarantee for their future, some of them start to invest in their farms (increasing of the individual herds, new buildings, etc.), a radical change occurs. Due to the “silent” revolution in the dairy ewe sector that occurred between 1960 and 1980 in the rayon, milk produced in Corsica and the French Pyrenees is no longer needed for Roquefort cheese production (Rieutort, 1995). Most of the Roquefort firms leave Corsica and the French Pyrenees to focus on the *rayon*. The main Roquefort cheese processor that remains in the French Pyrenees and Corsica, although on a reduced scale, is Société des Caves (which will be called RS). The firms’ leaders decide to diversify its production. They took an interest in local know-how and local cheeses, tending to appropriate local cheese recipes, or at least reinventing them, introducing technology and appropriating the regional cheeses’ image of authenticity. This strategy is perceived by local breeders as an attempt to grab on their collective heritage. It

leads them to implement a GI in order to protect it from what was considered as a threat. PDO Ossau-Iraty is created in 1980; PDO Brocciu in 1983⁵.

2.2.1. Framing intensification?

Initially, the PDOs' specifications and production areas are defined strictly in response to RS strategy. Stakeholders of both territories decide to include all the former Roquefort collection areas even though this might lead to inconsistency or conflict. In both PA and CS, the core technical specifications are strongly focused on processing recipes. This is because the producers feel in a hurry to protect their know-how from appropriation by RS (Sainte-Marie et al., 1995), and also – a less direct reason – because there are no rules on breeding or farming methods in the Roquefort specifications. By never having been part of such an institution, local farmers lack the experience on PDOs (legal protection, organization, management), and refer to the example they know most: the Roquefort Cheese.

In the 1980s, poor attention is given to those PDOs by local stakeholders. Although they exist, they are not adopted by most dairy-ewe breeders. They do not improve on the milk or the cheese's value added under a protected name, as has been observed in other cases (Beaufort, Comté) (Mustar, 1998).

Dairy-ewe farms experience an important phase of modernization, particularly in the French Pyrenees where dairy production boosts (22 millions liters in 1990). Herds' size increases (135 dairy ewes in 1989 in average) and breeding practices evolve (hygiene, animal feeding). Increasingly, more of the 3,200 producers equip themselves with milking machines. Fermented fodder (maize silage) builds up in the region: as farms are quite small (18ha in 1989 in average), such practice permits more milk to be produced within a smaller area. Transhumance evolves too: $\frac{3}{4}$ of the herds keep going to graze in mountain pastures in 1989, but they do not stay for periods longer than before. Moreover, some farmers decide to adopt foreign breeds of dairy ewes, these being more productive than local ones.

In Corsica, the 1980s sound the decline of the traditional pastoral model. According to Vallerand et al., 1991, 35% of the farms match with such model. Due to a lack of regional policies, 30% of farmers cannot find a way to structure their activity; they try to "survive" through on-farm processing and mixed-species breeding. Finally, the remaining farmers tend to settle, this allowing them to invest in their activity (mechanization, irrigation, etc.). Hence, dairy-ewe activity decreases drastically (loss of 25% of the farms between 1979 and 1988) falling to 550 breeders (Vallerand et al., 1991), while the regional herd remains quite stable (120,000 sheep), which also demonstrates the growth of individual herds. Dairy production increases as well, reaching 9 million liters in 1989 (compared to 7 million liters in 1971). Dairy-ewe breeding tends to concentrate more and more on the most favorable areas, where cultivated fodder is possible. This phenomenon is reinforced by the failure of speculative vine cultivation in the littoral area, which leads to more accessible dairy-ewe breeding areas.

As a result of a poor cheese valorization and the increase of dairy production, Pyrenean stakeholders experience a major milk crisis in 1991 causing milk price to drop. Dairy-ewe breeders realize how much they need to appropriate the PDO Ossau-Iraty and to ensure a better income throughout its use. More efforts are placed on Ossau-Iraty. More particularly, new specifications are introduced:

- Restricting the PDO's area of production, from the whole region, to the South⁶.
- Specifying the use of the local breeds for making PDO products as mandatory (1996).

In Corsica, a similar move is made: in 1998, only Corsican ewe breed (and Corsican goat breed) is authorized to make PDO Brocciu. In both cases, this involved a long period of hard work to structure the PDOs organizations: they were brought into line with local realities (widespread practice of on-farm processing; rotation of presidency between processors,

⁵ At that time, the term Protected Designation of Origin did not legally exist. It was created in 1992, by the European Union. However, the legal evolution of such status is not the object of our communication. In order not to confuse the reader, we will keep using the term "PDO" all along this paper.

⁶ The modified area of production is observable in *figure 1*.

farmers delivering milk and farmers processing on-farm) and their operating rules were drawn up.

In Corsica, supported by local researchers (Sainte-Marie et al., 1995), stakeholders also describe breeding practices (use of pastoral lands has to be major rule) and they agree on a minimum threshold of a farms' autonomy for animal feeding (only 20% of complementation can come from outside of the PDO Brocciu's area of production). Even though, the Corsican pastoral model seems to have disappeared, there is still a need to contain the product's origin and to frame the further evolution of breeding practices. Furthermore, these specifications seem doable at that time : most of the herds have access to pastoral lands or grass lands, complementation is not sufficiently spread (Vallerand et al., 1991).

In the French Pyrenees few specifications are settled concerning breeding systems. Farmers pursue breeding intensification and development of techniques such as Silage (*figure 5*). Therefore, in 2000, 48% of dairy-ewe farms use maize silage.

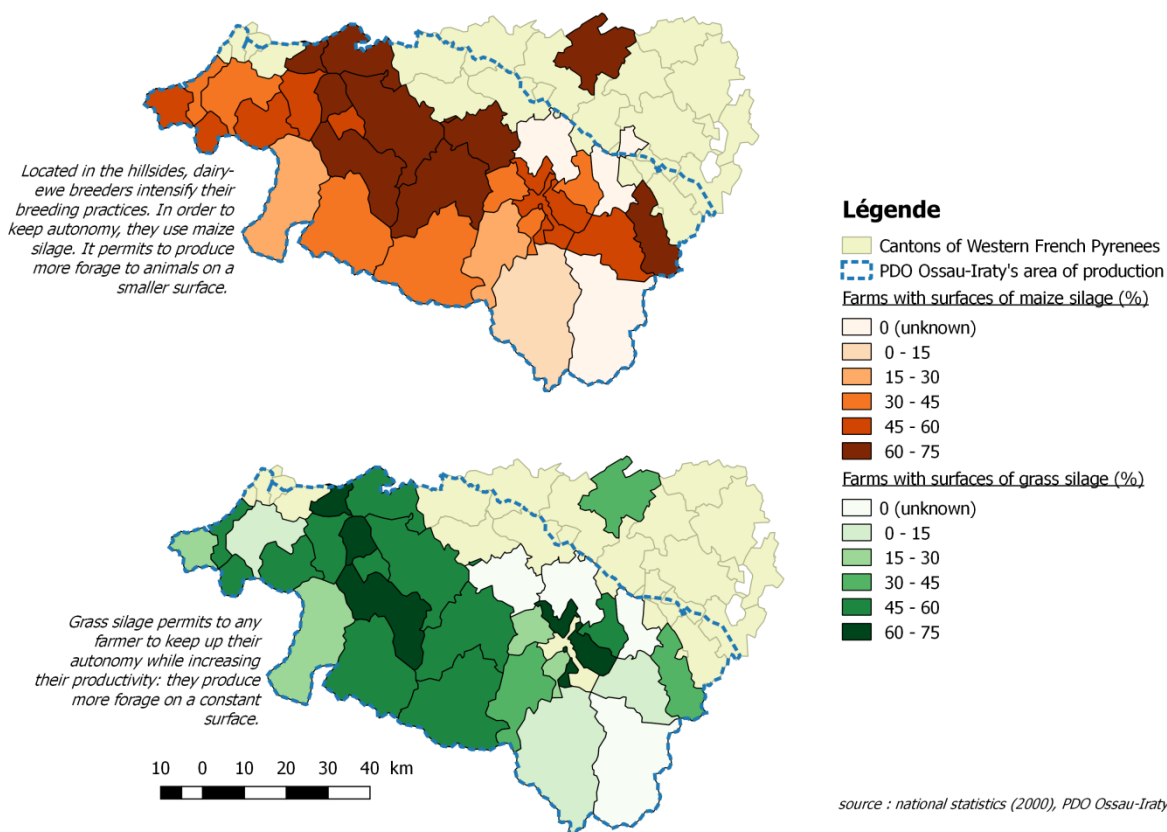


Figure 5: repartition of dairy-ewe farms with surface of silage (maize and grass) per canton

2.2.2. What about grass? PDOs' specifications over the past decade

Over the past decade the PDOs' trajectories have differed. On one hand, PDO Brocciu has not been a pillar for the development of dairy-ewe activity. Its leaders have faced abandonment which finally led to laissez-faire. On the other hand, Pyrenean stakeholders attempt to specify their PDO, framing breeding practices.

➤ Corsica: specifications on paper

At the beginning of the 2000s, as PDO Brocciu's specifications have just been formalized, producers organize themselves to control every operator producing milk and processing it to make Brocciu. They rapidly realize that specifications are not always respected: the issue of milk provenance is of particular concern. In a context of great tensions, Brocciu's collective and institutional activity ceases owing to management issues. In 2010, INAO (French national institute for PDOs) threatens to abolish it, which wakes the stakeholders up. Currently, the main firms comply with the specifications, farmers who sell their milk to the

main firms also comply (at the firms' demand), while most other farmers who process on-farm do not and have lost interest in it.

In parallel, the number of dairy-ewe breeders keeps on decreasing (lost of 1/3 of farmers between 2000 and 2010), while dairy firms continue opening external markets for Corsican cheese. Due to this contradictory phenomenon, milk is dramatically in shortage, leading most of the local dairy firms to buy foreign milk (about 2 million liters declared in 2012) and forcing breeders to produce more (about 9 millions litres produced in 2012, 2/3 is delivered). No clear difference is made in labelling the cheeses from both milk sources so the consumer cannot know the type of milk used.

In such context, respecting PDO Brocciu's specifications is not of concerns to the local stakeholders, particularly to breeders who deliver their milk and dairy firms which process it. When the only criteria of production is quantity of milk (which translates into one price for any milk produced in Corsica), and the origin of fodder or cereals is immaterial. Few breeders actually respect the rule of maximum 20% foreign complementation as the rule remains unenforced.

The PDO *Brocciu* has become the transmission belt of a production model based on grass cultivation. If this model can be easily applied in plains (*figure 6*), with irrigation and mechanization, its implementation in the mountains remains difficult. The less productive spaces are invaded by shrub (*observable all around the grass lands in figure 6*) and have lost their fodder value. The development of temporary meadows is also limited by climatic risks (drought) (*figure 7*). Thus, farmers tend to depend on purchased inputs, buying hay (in particular hay from the PDO *Foin de Crau*) and food supplements.

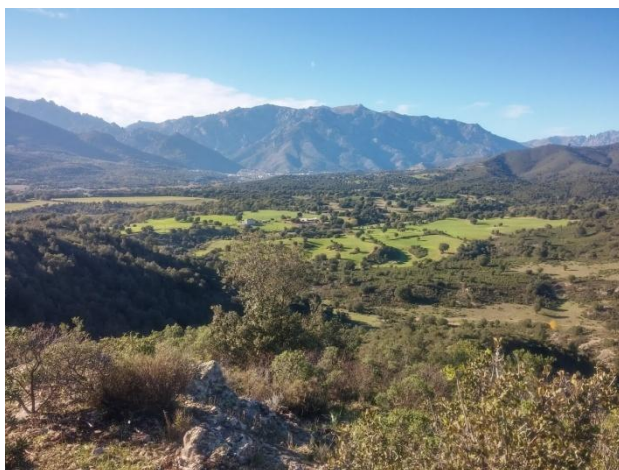


Figure 6 : a dairy-ewe breeding farm in the center of Corsica (Millet, october 2015)



Figure 7: Ewes in the Cap Corse area (Millet, august 2013)

➤ *French Pyrenees: Looking for autonomy*

At the turn of 2000, Pyrenean dairy-ewe activity is following a path of intensification. Farms tend to be more dependent on outside support, buying more foreign hay and complements (in 2002, on average, 1/3 of the herd's needs come from outside of the farm). For a group of engaged farmers, this path is not sustainable: believing this constant pursue of productivity will progressively exclude all the farmers who can't keep up with the pace (smaller farms, too important relief...). This phenomenon does not permit a collective strategy to be built for a high added-value cheese, depriving the dairy-ewe breeders of the region of fair compensation for their product. For this group of breeders, the solution lies in PDO Ossau-Iraty's specifications which have to be completed.

Therefore, this last decade has seen major changes in Ossau-Iraty specifications regarding the milk, dairy processing and cheese ripening. Particularly, after a long and harsh period of negotiation (2000-2006), a consensus finally emerges:

- in 2018, silage is forbidden and grass cultivation regulated (fertilization, pest management) in order to impede an excessive intensification in soil use and feeding.
- The quantity of animal feeding that is bought outside the PDO's area is limited.
- Milk productivity is limited at 300 l./ewe/year as a way for farmers to comply to extensive animal raising practices.

However, stopping using silage reduces autonomy if any breeders want to maintain his or her level of production: the principle of silage is to produce more on a given area. One solution that stakeholders have found is to promote fodder production complementarity between plain and mountain (since 2010). The goal of such a tool is to settle a sustainable network of producers of hay and cereals and buyers of such products, within the PDO's area of production. Hay and cereals (maize but also wheat and meslin) are mainly produced in the most productive fractions of the PDO's area in plains. Through this tool, they are able to sell *directly* to breeders and transport the hay and cereal to the higher parts of the area helping farmers there to comply with the PDO rules. In other words, the objective is to create cooperation between producers belonging to different sectors (cultivation *versus* breeding) and to finally create a local chain to supply dairy-ewe farms in hay and cereals.

The stakeholders of PDO Ossau-Iraty ordered a feasibility study done from 2005 to 2009. Potential for such a supply chain is real: only 5% of the maize area would be enough to cover the needs of dairy-ewe breeders in cereals; only 5% of the same areas could be converted into grasslands to cover breeders' needs in hay. This transition from maize to grasslands can be done as the maize market provides farmers with less remuneration than the hay market for equal amounts, as grasslands provide an interruption to the long monocultures of maize. In summary, there is an interest for local producers to adhere to the networks to sell hay and maize. However, between 2010 and 2015, the complementarity network has not been dynamic: few breeders use it. Specifically, it has been raised that the product quality has to be improved (project in progress). According to the network leaders, it might be more readily adopted by breeders in 2018, when silage is actually forbidden.

Finally, if complementarity between plain and mountain is one solution to the autonomy problem, it can't work alone. A study realized for the PDO Ossau-Iraty shows that the most dependent breeders are the ones located in the mountainous areas⁷. One key issue lies on PDO milk price, which is dependent on two principal criteria : quantity and hygiene.

➤ What about “estives”?

As we exposed previously, mountain pastures used to be an important dimension of traditional pastoral systems. Breeders would use it as a reservoir of grass during summer and a place to make local cheese. With the agricultural modernization, mountain pastures have been marginalized.

In the French Pyrenees, the small size of farms did not permit breeders to totally abandon mountain pastures. They keep going there, but for shorter periods, when dairy-ewes are dried. However, some producers keep making cheese in these mountain pastures. In the 1990s, some Pyrenean breeders and local authorities took the opportunity to repair the mountain sheep pens, in order to make such practice more convenient. From 2010, some breeders have gathered to better valorize cheese produced in such condition. They have obtained a label “estives”, which has been integrated into the PDO Ossau-Iraty's specifications. This gives tangible economic value to the cheese processing in the mountains and sustains such activity, which in turn contributes to the identity of the region through landscapes and green tourism.

In Corsica, if summer transhumance is still considered a tradition, rooting the dairy ewe activity in an ancestral past, it has become rare. The last few breeders who keep going there in summer do not generally produce milk and make cheese any more. In addition, the PDO

⁷ In 2005, the average quantity of food bought is 250 kg/ewe in mountainous areas, whereas it is 150 to 200kg/ewe in hillsides.

Brocciu is a fresh product which must be eaten in the 2-5 days after processing⁸. Such product can be hardly produced in mountain pastures, which are frequently in remote areas (absence of paths for motorized vehicles). The mountain pastures have been gradually invaded by scrubland (“maquis”) and forest, and the PDO-based farming system has been unable to avoid this phenomenon. Corsica is a major tourist destination whose credo is based on the naturalness of its landscape, inducing a kind of sanctification of the mountain area. Dairy ewe activity no longer manages the landscape; it just remains as a trace (*figure 8*).



Figure 8: billboard at the arrival to mountain pastures in Center Corsica (Millet, 2016)

3. Discussion

3.1. Stakes of proving origin, between framing and overflowing

Through time, we can observe how building a product under PDO is a constant continuous back and forth between new specifications, new rules and “new” practices. Proving the cheese’s origin has first consisted in creating the PDOs, and thus implementing limits for their production (Corsica, French Pyrenees). Subsequently it consisted in specifying the authorized local breeds for these new practices. Finally, dairy-ewe breeding systems have been framed, though they have not been totally respected in Corsica. Each period of specification corresponds to a reaction of stakeholders facing the evolution of their activity: Roquefort retirement first, the increasing adoption of foreign breeds then, and, nowadays, the trend of farming systems to intensify more and more.

Such process is embedded in more global phenomena. Considering farming systems, at a European level, for 15 years, the territorial attributes of animal feed have been questioned and it has been recognized that natural grassland and its products (grass and hay as

⁸ Brocciu can also be ripened but such practice is more rare, and unknown of foreign consumers and tourists.

"spontaneous" food) as well as summer pastures (used through the practice of transhumance) are items which ensure the good reputation of any cheese under protection. These practices are, for the most part, dotted of attributes of being traditional and being healthy; for many farmers, they are a key element of their cheese's origin, as terroir is for wine. It is important to notice that such a trend is general at least in Western Europe, where PDO rules tend to emphasize the role of grassland (Faruggia et al., 2008). A higher reliance on meadows is also related to an improved feeding autonomy within the farm and the PDO area.

3.2. Heterogeneous spaces, indeed!

PDOs' specifications are not only built in order to prove the protected cheeses' origin, but also to work on equity within PDOs' area of production. While presenting Corsica and the French Pyrenees, we emphasized how varied the geography is between mountain and plain. We then showed how those different levels of altitude used to function together: between cultivation and breeding, between transhumance in lower altitudes in winter and transhumance in higher altitudes in summer.

Nowadays, while PDO *Brocciu* shows a contraction of the space and no real capacity to deal with spatial heterogeneity, PDO *Ossau-Iraty* design a redeployment of complementarities mobilizing the contrasts within the area and attempting to maintain farmers in hills and mountains. It seems that PDO *Ossau-Iraty* is moving toward a reconstruction of those complementarities that existed before between plain, hills and mountain. However, it is not about being straightly faithful to tradition: it is not about the mobility of animals anymore, but about the flow of commodities between distinct local sectors, about the construction of new solidarities. Per se, it is, according to us, a phenomenon to follow.

The material reality of the territory registers human action in a certain temporality, that of the environmental background, of the vegetation (Bertrand & Bertrand, 2002), and questions the reversibility of the social and economic choices. Would the reuse of mountain lands as pastures for dairy ewes be possible? Would local stakeholders have such a will? Spatial heterogeneity in fact raises the question of the value of different spaces and environments provided by producers and processors within a GI, but also by local stakeholders at a regional scale and therefore their willingness to make use of all or part of the available space, developing and reshaping the environment. What is the value of mountain pastures? This question remains unanswered today, in Corsica, but also in the French Pyrenees.

Therefore, the story of Corsican and Pyrenean dairy-ewe activity underlines that the territory is not one, it is multiple (Levy and Lussault, 2013). It is composed of interlocked areas. To consider the territory, or any territorial action, as an organizational whole leads to get rid of this reality, to put it aside. It then resurfaces in a physical, visible, tangible form as the desertification of the interior, the depopulation of the mountains, the emergence of shrub and reforestation, the risk of fires... short through use of differentiated environment, support of any territories. It refers to the landscape issues, but also to issues of changing environment (biodiversity) and so "terroir", as an agroecosystem (Salette et al., 1998).

3.3. Toward more spatial justice?

Our problem finally converges towards the issue of spatial justice. Inequalities are related to the structural configuration of an area (Lefebvre, 1972), such as differences between mountains and plains observed in France in the course of agricultural modernization in the 1950s. For urban geographers, spatial injustice means that everyone doesn't have access to the same resources according to its location (Harvey, 1992), and that local authorities fail to counterpart that situation.

As the editorial board of the new journal "Spatial Justice" is pointing out, "space is a fundamental dimension of human societies and (...) social justice is embedded in space. The

*understanding of interactions between space and societies is essential to understand social injustices and to reflect on the planning policies that aim to reduce them*⁹.

A common way to tackle this issue is to work on redistribution of space rights among populations, for example when European policy creates special subsidies for producers located in mountains (Eychenne, 2012). Such action has limits: top-down policies of this type tend to fail or to create new social inequities (Blanchon et al., 2009). It also raises an ethical question: can issues that are generated by inequities be valued and actually compensated?

In our situation, this is not really an option as the producers claim for taking into account inequalities and take advantage of them, rather than try to cancel them. Another way of tackling the concept of spatial justice, more adapted to our topic, is to focus on decision-making procedures (Soja, 2010). As well demonstrated in the *Ossau-Iraty* case, a revision of initial collective rules concerning the attributes of a PDO induces a new balance between plain and mountain and allows for increased spatial justice in the PDO area. In the other case on the contrary, the PDO *Brocciu* set of rules encouraged further marginalization of mountain farming. In both cases, the issue of products' price (milk and cheese) is, of course, essential too. Focusing only on productivity leads to the exclusion of the most vulnerable producers.

This finally raises issues of representations of territorial identities (between plain, mountain and hillsides) and of social practices within a unique PDO. This shows how a healthy governance within GIs is complex to establish, but essential to their success (Vandecandelaere et al., 2018). It stands on a mutual recognition of skills : to produce a common good, between breeders and dairy processors ; to equitably contribute to its production, between plain and mountain.

As well demonstrated by the *Ossau-Iraty* case, by the rules revision, the PDO governance induces a new balance between plain and mountain, notably through the label "estives". Such strong choices are also sustainable because they have been supported by local authorities and extension organisms. Making a territorial project from a GI relies on public investment (Vandecandelaere, 2016). These dynamics have to be strengthened. However, they rely on another approach of development. It is oriented towards organizing places in order to let everyone access equitably to different opportunities, that is to say "territorial differentiation" (Brennetot, 2011). Through the update and the valorization of meaningful *local* practices, supported by a strong European legislative tool (Geographical Indications), local stakeholders can play the "politics of Difference" (Young, 1990) and build their own condition for local spatial justice (Blanchon et al, 2009).

Conclusion

The approach of Geographical Indications through spatial heterogeneity and spatial justice allows us to rebuild a link between physical dimension of such alternative systems (classical geography, agronomy) and their organizational dimension (Brennetot, 2011). The approach that is generally chosen is to focus on how local stakeholders coordinate each other, how they act collectively, but poor attention is given to the consequences of such actions and practices on local stakeholders' environment. When considering both dimensions, we demonstrate how PDOs can be considered as strong shells, strengthened by European legislation, that have to be "filled" by local stakeholders in order to be meaningful and effective.

Dealing with spatial justice leads us to consider *terroir* and sustainability together. In a context of climate change, stakes of sustainability and resilience have never been as important as nowadays. Therefore, PDOs, and, more generally alternative food systems, can't only be analyzed according to their authenticity any more. They also have to be

⁹ <https://www.jssj.org/issue/mars-2017-editorial/>

analyzed according to their potential to engage local stakeholders towards more social equity and a coherent relationship with their local environment.

According to our findings, PDOs exert a lot of influence on territorial development. The way they are designed and governed may lead or not to more spatial justice, and behind it, to more sustainable agricultural and rural development. The notion of spatial justice should be explored more in-depth to complete the ways of studying the PDOs and their impacts.

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