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# Multifunctionality of livestock to support plain-mountain complementarities. The Fricato case study in the french mediterranean area

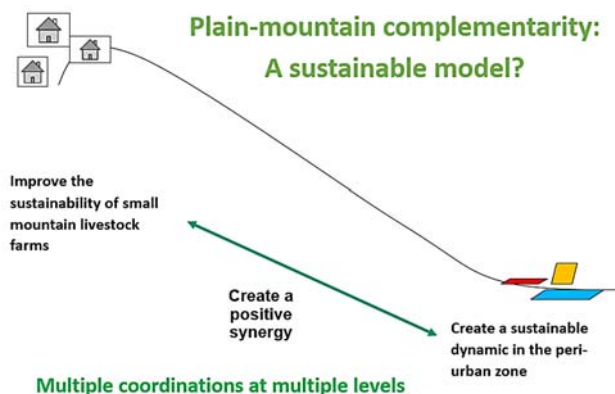
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GASL

As a result of the public policies and agricultural development models imposed during the second half of the 20th century, there are contrasting sides to the Mediterranean territories in France: intensive monoculture on the plains or lowlands, viticulture in the coastal zone, and a neglected inland area, where pastoral livestock farming is the basis for an economic and social activity. Today, this model has reached a point of exhaustion. In the coastal peri-urban zones, abandoned and uncultivated land is expanding, as a result of the successive campaigns to grub up vines, and the severe land pressure. This abandoned land can cover 40% of the territory, as in Clairà (on the edge of Perpignan, Pyrénées Orientales). In the piedmont areas, small family agriculture is in constant regression. This leads to a closing up of rangeland and woodland, making it increasingly difficult to maintain agricultural activities in these spaces. Territories in both the plains and piedmont areas are under threat, leaving us with the question: *Could abandoned peri-urban land become a resource at regional level, to strengthen synergies between pastoral farming in piedmont areas and diversified agriculture in the on the plains?*



**Figure 1.** Plain-mountain complementarity: a stake in increasing the sustainability of activities and territories?

The Fricato project for plain-mountain complementarity<sup>3</sup> allows reflection on the sustainability of the activities and territories, while improving the efficiency of pastoral livestock farming in piedmont areas and renewing agricultural models on the coastal plain. It is part of a collective drive to encourage cooperation at regional level between different territories and activities. It received support from the French Ministry of Agriculture (Casdar MCEA<sup>3</sup> call for proposals 2013), under the "agro-ecological project for France" framework (Le Foll, 2012).

<sup>3</sup> Hunting and Nature Trust

Most approaches for the integration of agriculture and livestock farming that have been studied involve either private situations between (geographically close or distant) crop or cereal farmers and livestock farmers, reorganisation projects between farms to connect crop and livestock systems, or neighbouring farmers sharing their land to better manage rotations via crop diversity (M.Mohammed, 2015, Couturier et al, 2016, Thérond, 2016; Moraine, 2016; Duru et al, 2015, RMT Spycy). The Fricato project stands out because of its ambition to co-design collective action, in order to resolve the double problem of abandoned, uncultivated land on the plains and of maintaining pastoral farming in the mountains. The multifunctionality of livestock farming lies at the heart of the project. It must meet the expectations of local stakeholders on the plain, and those of livestock stakeholders in the mountains. Pastoral farming is an essential component of this complex system, which must build connections between contrasting territories and satisfy the diverse concerns and expectations of the stakeholders.

This text aims to analyse and learn from this innovative project. We will examine the multifunctionality of livestock farming via the concerns and perceived stakes for the actors affected by the project, both on the plains and in the piedmont area. We will describe the origins of the project and its current operation, and identify its strengths and weaknesses. In the discussion, we will return to the issue of livestock farming multifunctionality.

## A BRIEF OVERVIEW OF THE PROJECT

The Fricato project aims to strengthen the synergies between coastal and inland areas, and between crop and livestock farming, to solve a double problem concerning feed autonomy of piedmont livestock farming and the revival of abandoned land on the peri-urban plain. Therefore, looking beyond the Fricato project, this is a reflection on the sustainability of activities and territories, on the level of the small region between plain and mountain.

The municipality of Clair (Pyrénées Orientales coast), has long been trying to slow the spread of abandoned land on its territory and restore agricultural diversity. In 2012, the local council contacted livestock farmers in the Canigou piedmont area. Since 2013, it has been cooperating with seven livestock farmers from the Canigou piedmont area in the Pyrenees (a 1-2 hour drive away), by building collective action supported by the Fricato project. The council provides facilitation for land access and usage

issues, to encourage landowners to give livestock farmers free use of their uncultivated land. The livestock farmers cultivate this formerly neglected land, to produce feed and cereals for their animals. This project, which is seen as a challenge by lowland and mountain stakeholders, fosters collective action and mutual learning. We will examine the project in detail later in the study.



## METHOD

We chose to approach our subject via a case study (Michel, 1983). We conducted comprehensive interviews (Darré, 1990, Kaufmann, 1996, Darré et al, 2004) with all the livestock farmers involved, local players on the plains (land issues facilitator, councillors, etc.) and institutional partners concerned by FRICATO (livestock farming adviser at the Pyrénées-Orientales Chamber of Agriculture, the *Maison de la Chasse et de la Nature*<sup>3</sup>, the biology-agronomy IUT<sup>4</sup>). The interviews focused partly on characterising the activities of the stakeholders and on how they viewed these activities, and partly on how this project changes their activities. Via a cross-analysis of these interviews, we identified the main elements in how the actors talk about this project. This revealed both limitations and advantages. By reconstructing the origins of the project, we were able to identify the actor networks, and the initiatives and conditions that contributed to the emergence and outcomes of this experiment (Darré, 1996, Callon 2001). Participants were observed during events organised by the partners (celebratory meal held by the livestock farmers and the municipality for those concerned by the project in 2015 and 2016, reception and tour for a visiting group of wine producers from Burgundy who were interested in this project in January 2016). Finally, a student working on several examples of livestock-crop complementarity in Southeast France met Fricato partners for semi-structured interviews (Mohammed, 2015).

<sup>4</sup> University Institute of Technology

## LONG-STANDING CONCERNS

### ***Close connections between livestock farming and the landscape in the piedmont area***

***Working to reclaim environments and facilities:*** The livestock farmers settled on farms outside the family framework 10 to 30 years ago, on the Canigou piedmont area, in zones of agricultural decline and neglect. In the past, these spaces had been used for small-scale farming, but they closed up from the 1950s. Since they set up here, the livestock farmers have been progressively reopening the old fields and gardens, clearing woodland, and restoring access routes and buildings. *“I restored the meadows with my chipper. It can’t be mechanised. Looking at this brushland, you wouldn’t think it, but there’s a huge resource, if you open it up. Back in the day, these grasslands were the gardens of the village. There are pretty terraces now, around the village. I’ve had nothing but positive feedback.”* (B.V., livestock farmer, May 2015). This work to clear and open the land, as difficult as it may be, is crucial for livestock farming. Each meadow re-opened provides more pasture for the herd, in addition to the rangeland, and sometimes, when the land can be irrigated, it provides some hay for the winter. The herds are moved (transhumance) to graze in the Canigou mountain pastures in summer. This keeps the grass short, reducing the risk of avalanches. In the piedmont area, grazing therefore provides essential maintenance for environmental diversity. The network of environments gives value to the landscape of the Canigou territory. These landscapes, which are closely intertwined with pastoral activities, are harnessed as a regional tourist attraction by local players. For example the Catalan Pyrenees regional park was officially recognised in 2004, and Canigou was recognised as a major tourist site (*Grand Site*) in 2012.



***A delicate balance:*** The seven sheep farmers involved in the project have small flocks (100 to 200 sheep). They have no (or very little) arable land on their holdings. They feed their animals by grazing (woods, moors, natural meadows), except in winter (Annex 1). It is a frugal system, aiming to manage their flocks in a way that is compatible with the available territory, to limit inputs (flock numbers and management). *“It will always be a small flock, because the land is dry here. Feed resources are limited. I have to work according to my environment, as far as possible. For the rangeland I have, I need to keep numbers no higher than about 120”* (G.D., livestock farmer, May 2015). However, these small flocks provide little economic margin. It is a delicate balance.

### ***Livestock farmers’ motivations to participate in a project for plain-mountain complementarity***

***Reducing winter feed costs:*** The increase in feed prices since 2008 is a drain on the income of livestock farmers. Limiting winter feed costs is crucial for the sustainability of their farming activity. Having arable land on the plains is one way of producing the feed and cereals they need for winter.

***Building a new agriculture:*** *“I’m sick of being caught between a feed trader who provides everything and a slaughterer*

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*set up in the mountains. The person who takes over the land doesn’t have to worry about how to bring in grass. We leave them shares in the SARL, and they don’t need to invest in any equipment. CUMA and SARL<sup>3</sup> can help them take over the farms. When we go, either the young people take over, or it all collapses. If nothing is in place for when we leave, it’s over.”* (J.T., livestock farmer, May 2015). In this context, Fricato assists farm set-up in the piedmont area. The SARL is an organisational innovation, which could facilitate the takeover of piedmont farms without cultivable land.

***Thinking collectively and rising to the challenge:*** *“There are several of us with the same interests. It’s a good idea to build something together.”* (C.B., livestock farmer, May 2015). The SARL becomes a framework to encourage exchange between peers. In this case, the peers are the livestock farmers concerned, who recognise and describe themselves as *“small piedmont sheep farmers outside the family framework.”* The Fricato project gives them clear collective meaning and recognition.

<sup>3</sup> CUMA: Agricultural Equipment User Cooperative. SARL: Limited Liability Company

The question of resuming cultivation on abandoned land on the plains to produce feed for mountain livestock farmers has been under debate for a long time in agricultural and livestock farming networks: *“We’ve been talking about the idea of using this uncultivated land for 20 years. Fricato is the first example of a collective project. It’s the first full-scale test.”* (A.R., livestock farming adviser at the PO Chamber of Agriculture, January 2017). *“Being a collective meant we could go for it. Alone, it was impossible”* (G.D., livestock farmer, May 2015).

*Piedmont livestock farming multifunctionality in brief:* gradually, the livestock farmers have restored agricultural value to the farmland, but also enhanced the local landscape.... They help to maintain agricultural, economic, social and tourist activity in the piedmont area. The utility of this dynamic goes beyond their farming activity alone. However, it is a delicate balance. It is important to make these farms more sustainable, both for the farmers and for society in these piedmont territories.

### **The inexorable spread of abandoned land on the plains**

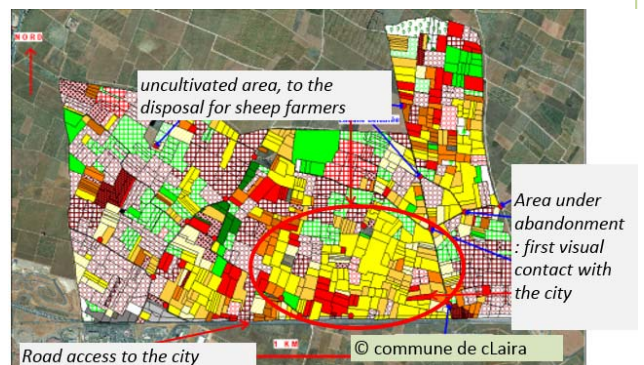
The successive campaigns to grub up vines have allowed the spread of uncultivated wasteland in these coastal zones where land pressure is severe. In Clair, this land covers 40% of the territory. The growth of these areas, the biodiversity loss and the negative image surrounding them are all recurring concerns for stakeholders in the plains.

*The ACCA<sup>1</sup> hunters and the technicians from the Maison de la Chasse et de la Nature* are critical about biodiversity loss in Clair. Since 1990, they have made various attempts to reintroduce islands of biodiversity (local planting schemes, introduction of species, etc.).

*The Pyrénées-Orientales viticulture advisor* complains about the loss of agricultural land: *“We’ve lost 40% of our agricultural surface in 15 years. To maintain an agricultural sector in Pyrénées-Orientales, we would need to plant 1000 ha per year. Only 300 ha are replanted each year. It’s vital that we avoid losing farmland, either by diversifying crops, or by using agro-ecological techniques.”* (25/01/2016).

*Clair’s councillors* dislike the image that this neglected land gives to the community: *“We are the gateway to the department. The first thing that people see in Pyrénées-Orientales on their way to the sea is abandoned land and illegal dumps...”* (Mayor of Clair, 25/01/16). They are worried about the fire hazard. They are looking for ways to revitalise their territory, diversify agriculture and find solutions that work with the local conditions. In a proactive step, they collaborated with the Perpignan IUT<sup>1</sup> to conduct a territorial analysis in 2008. This showed that abandoned land made up 40% of the territory. In response to this observation, the local authorities hired a land issues facilitator in 2010. Her role is to encourage and support agricultural diversification in Clair, *“by finding little niches”* involving products, adapted varieties, and suitable commercial circuits, and by harnessing all the available contributors and resources.

There have been various actions since 2008, in partnership with numerous actors and institutions<sup>1</sup>: trials involving medicinal plants, and plantation trials for 15 varieties of trees tested on 8000 m<sup>2</sup>, including pomegranate, pecan, almond and rubber trees (guayule). A mill has been restored, and 4 ha of land have been replanted with old breadmaking varieties (10 varieties, including “Barbu du Roussillon” wheat). The municipality is working to increase residents’ knowledge and awareness about this initiative, and aims to create a local dynamic, so that landowners can be encouraged to allow use of their uncultivated land.



**Figure 2.** The northern part of Clair

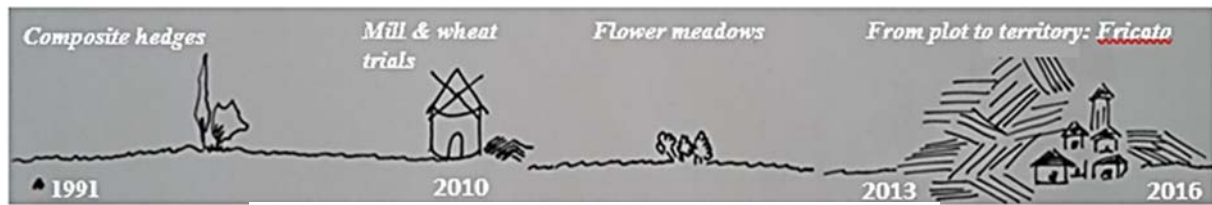
In short, in terms of multifunctionality, the concerns for stakeholders in Clair are:

- Maintaining an agricultural sector in the area, and preserving agricultural land
- Relaunching diversified agriculture with suitably adapted value chains
- Harnessing uncultivated land for agro-ecological schemes.

<sup>1</sup> ACCA: Approved Communal Hunting Association

<sup>4</sup> Perpignan University Institute of Biology and Agronomy

<sup>5</sup> The municipality, the agronomy-biology IUT, the Cirad (French Agricultural Research Centre for International Development), the Maison de la Chasse de la Nature (Hunting and Nature Trust), etc



To see what the stakeholders say (in French), follow the links below:

Video from the specialist agriculture site “pleinchamp.com”, by agricultural journalist Raphaël Lecocq: <http://www.pleinchamp.com/vigne-vin/actualites/du-vin-aux-ovins-ou-comment-reconvertir-des-friches-viticoles-en-cultures-fourrageres>

Two videos from the French Ministry of Agriculture: Full version: [www.lacledeschampsfleuris.fr](http://www.lacledeschampsfleuris.fr); Short version: <http://agriculture.gouv.fr/de-lautonomie-alimentaire-pour-les-troupeaux-sur-les-terres-dune-commune>

## A CONVERGENCE OF DIFFERENT INTERESTS TO PROMOTE PLAIN-MOUNTAIN COMPLEMENTARITIES

### *The Fricato project for plain-mountain complementarity*

The Fricato project was initially driven by local stakeholders on the plain. In 2013, they made an offer to the Canigou piedmont ovine farming cooperative: to make land that was uncultivated (and sometimes had been for 20 years) available to livestock farmers free of charge, so that they could recultivate it using agro-biological techniques. Seven piedmont sheep farmers (located 1 to 2 hours’ drive from Clair) joined the project. Finding land to grow feed allowed them to improve their autonomy in feeding their flocks.

Thanks to the work of the land issues facilitator, the total uncultivated area available to the livestock farmers increased from 33 ha in 2013 to 70 ha in 2016. The local authorities paid for the recultivation of the first 33 ha (650 to 950 euros per hectare). The livestock farmers were responsible for funding recultivation on the remaining hectares. Most of the land was made available for one year (free loan). In 2016, the livestock farmers were given a 5-year lease, for around 30 ha (necessary to obtain MAE<sup>6</sup> aid).

The recultivation of old, unused vineyards, with a transition towards organic farming, requires specific know-how and expertise. The livestock farmers had to learn about growing crops: a new skill for them. They received mentoring from a cereal farmer from Aude, funded for 3 years by the Clair council. They set up crop rotations to produce feed in the form of legumes, cereals (barley, meslin) and straw. The feed and cereals are transported to their livestock farm to feed their animals in winter. Whether it is in the lowlands or the mountains, storing feed and cereals is problematic.

Those involved (livestock farmers, hunters, crop farmers, municipality, etc.) use the crop selection and work periods to discuss and help each other. 10% of the recultivated land is allocated to encouraging biodiversity. In cooperation with the municipality, the hunters, and the *Maison de la Chasse de la Nature*, flower strips are planted in certain areas, to create islands of biodiversity.

The livestock farmers formed a **SARL** in 2014. It receives aid under the CAP<sup>7</sup>, to farm land on the plains. This funding is invested to cultivate land in Clair. (5 years?). The livestock farmers have no farming and harvesting materials. They primarily rely on service providers to recultivate the abandoned land and harvest the crops. However, the scattered nature of the plots, their small size (3000 m<sup>2</sup> on average) and the poor quality of the land (heavy, stony soil), mean that using the services of agricultural entrepreneurs is an impractical solution.

Eventually, in 2016, the livestock farmers formed a **CUMA**<sup>8</sup>. They bought two tractors and harvesting equipment so that they could grow and harvest the crops themselves. The Fricato project obtained **GIEE**<sup>9</sup> status in December 2015. It was also a winner in the 2016-2017 Agro-Ecology Awards (see link to French Ministry of Agriculture website, op. cit.). Finally, the Fricato project brings together numerous players. These include the Chamber of Agriculture, the ACCA, the *Maison de la Chasse de la Nature*, the biology-agronomy IUT, the BIOCIVAM<sup>10</sup>, the DRAAF<sup>11</sup>, landowners, local farmers and piedmont livestock farmers.

<sup>6</sup> MAE: Agricultural Environmental Measures

<sup>7</sup> CAP: Common Agricultural Policy

<sup>8</sup> CUMA: Agricultural Equipment User Cooperative

<sup>9</sup> GIEE: Economic and Environmental Interest Group

<sup>10</sup> BIOCIVAM: Organic-focussed Initiatives Centre for the Promotion of Agriculture in Rural Environments

<sup>11</sup> DRAAF: Regional Department for Food, Agriculture and the Forest

## **Lessons from the first years**

### **Many lessons and positives**

*A successful land access dynamic:* Since 2013, the amount of land made available to the livestock farmers has been constantly increasing. The success of the project in Clairia has generated interest among other communities and landowners. The region can learn much from this pilot project.

*On the plains, the agro-ecological transition is clear and significant.* This transition concerns the conversion and revival of both the plots (nature of species, technical itinerary for organic farming) and the plains territory as a whole (a way of combining diverse crops to encourage biodiversity). This project to resume cultivation on abandoned land using agro-ecological techniques gives new agronomic value to the plots, and enhances the value of the local environment and landscape. It opens the way towards new agricultural models. In 2015, the local facilitator wrote: *“This project gives new life and hope to forgotten and abandoned crops, feed types and cereals. In the future, I think that this project could encourage farmers on the plains to diversify, and perhaps even work in a complementary way with livestock farmers. For now, this project is in its early days and is proving successful. (...) It doesn’t try to revolutionise lowland agriculture or livestock farming, but today, agricultural models are showing their limitations, and this pilot project could be an unexpected model, because it is driven by regional players and not by the economy (or in any case not directly), and because it comes out of a real need and is adapted to the local context. It is a project that is destined to develop and evolve, for the local livestock and crop farmers, and for everyone involved.”*

*Consolidating the flock grazing and feeding calendar.* To be sustainable, the system used must provide ways to improve the operation and technical-economic results of pastoral farming in the mountains. The analysis of the Fricato project shows that with the production of feed and cereals on the plains, the livestock farmers find different ways of organising the grazing and feeding calendars for their flocks. The best natural meadows available to livestock farmers in the piedmont area will no longer be reserved for cutting. They will be grazed in spring by mother ewes, as a complement to the rangeland. Until now, most of the livestock farmers have not given commercial food to their sheep. They want to use the cereals produced in Clairia to supplement food supplies during lambing. These changing practices (grazing management and supplementary feed) will improve the nutrition of the sheep early on in lambing season, supporting their lactation and helping the lambs to grow faster.

Beyond improving feed autonomy, the ability to control the quality of the food given to the flock suits the farmers’ perceptions of their profession. The recognition surrounding the Fricato collective action gives legitimacy to their search for an agricultural model for small-scale pastoral farming in the mountains.

*A project that changes how livestock farmers see the role of their activities.* For pastoral livestock farmers, the multifunctionality of pastoralism with regard to the mountain territories where they have settled is obvious (*“I’ve had nothing but positive feedback”* (op. cit.)). The Fricato project has given them a broader perception of the multifunctionality of their activity. They are becoming open to new dimensions, in connection with what their activity can offer to peri-urban areas far from the plains. *“Initially, I didn’t consider the territorial project, the pilot experiment. Now, I’m very proud of it: we have photos showing that the fire in Clairia stopped at our crops.”* (G.L., livestock farmer who joined the project in 2016, speaking in January 2017).

*Establishment of a collective dynamic* on the plains between the various stakeholders, livestock farmers and landowners, hunters, councillors, and the people of Clairia. The livestock farmers’ lack of experience and the image surrounding small livestock farming in the Pyrénées-Orientales mountains creates solidarity and sympathy for this project, among the many stakeholders (from landowners to ordinary citizens).

*Knowledge for the “scaling” of collective projects for plain-mountain complementarity.* Based on these first years, those involved have drafted a model for a collective entity: around a hundred hectares gives winter cereal and feed autonomy to 5 to 7 small piedmont pastoral farmers (100 to 200 sheep). This format seems compatible with the governance of collective action by the livestock farmers, to cultivate land on the plains. However, a hundred hectares may not be enough to balance out the costs of equipment and land issue facilitation (see below).

### **There are several difficulties when it comes to consolidating this kind of project:**

*Organising the work* is very difficult. Firstly, this concerns the organisation of work at farm level. The livestock farmers are often alone on their land. In certain periods, particularly spring, they are forced to juggle the demands of their livestock farming and their work in Clairia. For livestock farmers, this lambing and early suckling period is crucial, and

has a big impact on lamb production. It is also a crucial period for successful cultivation on the plains. The SARL can provide some solutions. Working as a collective means they can organise the distribution of work in Clairia. The SARL manager's coordination of the livestock farmers' collective is a hard job, but it is vital to the project.

Setting up farm facilities to support farmers' participation in the project. To free up time, particularly in spring, livestock farmers need to be able to put their flock in paddocks, and therefore need a few enclosed plots. They must be equipped with a silo to protect the cereals produced in Clairia from rodents. However, little consideration was given to this aspect at the start of the pilot project, especially as Casdar funding must essentially go towards organisation and facilitation. Learning from the experience of this pilot project, it seems necessary to take into account these dimensions from the design phase of a complementarity project.

Good equipment: After three years of the pilot, it became apparent that farming and harvesting equipment needed to be acquired for those involved. Via the CUMA, the livestock farmers invested in this equipment, subsidised to a level of 40%. However, with 60% of the investment left to pay, they took out a loan. This investment, without which the project cannot continue, is a heavy burden for small mountain farmers. Moreover, the productivity gain is very slow for the abandoned ex-vineyards that they have taken over.

Access to aid: The conditions for setting up this kind of project are not always compatible with the conditions for obtaining CAP aid. To access MAE-bio aid for organic agro-environmental measures, they need property rights of 5 years or more, which is not the case for all the recultivated plots in Clairia. Moreover, certain piedmont pastoral zones (moors – woodland) are not recognised as grasslands that help to feed the flock, thus restricting this aid to open natural meadows alone. The specific characteristics of recultivating abandoned land on the plains, such as grazing in rangeland and woodland within piedmont areas, make it difficult for innovative collective actions for plain-mountain complementarity to qualify for CAP aid for the land. To support this kind of project, aid schemes need to do more to accommodate a multifunctional vision of agriculture.

Property rights to enhance the value of recultivation: Recultivation takes a lot of work and money (650 to 950 euros/ha on average, estimated based on the cost of the first 33 ha). It takes several years to restore the economic potential of this degraded land. The current short duration of property rights (1 to 5 years) is an obstacle. The livestock farmers think that 7 to 10 years would be an acceptable compromise, to restore the agronomic value of the land and truly benefit from this redevelopment.

The need for land issue facilitation in this type of project: The average size of the plots is 3000 m<sup>2</sup>. In 2016, the 70 ha of recultivated land was shared between 75 owners. Land issue facilitation must be continued, to encourage owners to make their uncultivated land available, and to manage a portfolio of hectares over time (Clément et al, 2018). Local facilitation, by someone who is familiar with the area and the various stakeholders in the plains, is indispensable when it comes to implementing this kind of project and running it in the long term. How can this facilitation be continued? The small community of Clairia (with a population of 4000) invested in this facilitation for 3 years to launch the project, but the scope of this kind of position would need to be broadened. For example, it could be envisaged on another level, in connection with an intercommunal approach. Finally, the spatial entities to which the policies apply often disconnect plain, mountain and piedmont territories, which can be detrimental for this kind of project.

## **FROM THE FRICATO MODEL TO ITS INTEGRATION IN A TERRITORIAL DYNAMIC: DEVISING A REGIONAL MODEL**

This collective action opens up innovative possibilities for dealing with a double challenge: firstly, the emerging acceptability of diversified agriculture on the plains and in peri-urban zones, and secondly the maintenance of family pastoral farming in piedmont areas.

Based on the first years of implementation, *it is possible to draft the format for a livestock – crop farming integration model*. A format involving 5 to 7 livestock farmers, with 120 to 200 sheep per holding, and who have around 100 ha, would be compatible with the governance of the SARL by the livestock farmers and with the objective of feed autonomy for the SARL flocks. However, this scale (100 ha) alone is not enough to justify employing a land issues facilitator for the plains. As suggested by those involved, it might be possible to share the facilitator on a bigger scale, within a community of communes or a metropolitan area, like Nantes Métropole for example (Perrin et al, 2018). In such a model, the facilitator would be in contact with several livestock farmer SARLs, from different mountain territories, cultivating land portfolios on the plains.

The question remains open, with possibilities on a regional scale... The livestock farming adviser indicates that this kind of project would concern 60 to 80 small piedmont holdings without arable land. OG, livestock farmer, SARL manager, and AFP GP<sup>12</sup> administrator reflects on the possible scope of this kind of project in the department:



*“With an extra 1000 ha of feed, the local livestock farmers would be autonomous in their department. There are over 10,000 ha of abandoned land in the department.” (May 2015).*

This type of project can be a solution for supporting livestock farming in piedmont areas. It allows “small” farms without arable land to cultivate their own feed, so that they are not dependent on fluctuating market prices and can produce organic feed and cereals to get quality produce... in line with the agricultural model to which they wish to contribute.

On the scale of a department like Pyrénées-Orientales, this model of plain-mountain complementarity seems like an interesting solution to support activity in piedmont areas and to add value to the lowland plains. Many of the unknowns from the start of this project are now resolved: the possibility of finding land on the plains, of forming a positive dynamic, of producing feed and cereals, etc. Others persist, such as investment for equipment, visibility regarding the duration, and access to aid. The Fricato project has received support from the Ministry of Agriculture, mainly for the organisational and facilitation aspects. These are important issues. However, in the case of the Fricato project, where livestock farmers are responsible for cultivation, but do not have the necessary equipment, it seems that the purchase of materials and equipment is essential for the success of the project. This leaves us with the question of how the farmers might acquire this equipment, which is useful to everyone (to the livestock farmers for feed production, and to actors on the plain so that their uncultivated land can be cultivated again). Who should be responsible for these investments? In the launch phase of such project, should some of the support be used to fund the purchase of equipment? There are several possibilities, including “over-funding” of investments and facilitated access to aid portfolios.

The numbers of proposals to make land available are increasing. It therefore seems that the crop-livestock complementarity principle could usefully be replicated in the department and the region. The question of the equipment needed to recultivate the land requires careful consideration. It might create competition for the granting of these lands between piedmont pastoral farmers (like those in the Fricato project) and farmers in neighbouring crop-livestock polyculture regions, who already have their equipment. In this case, the perspective of cultivating land on the plains could not help to maintain a pastoral activity in the piedmont area. It is undoubtedly easier for a territorial authority on the plains and for landowners to make contracts with farmers who already possess mixed crop-livestock holdings, and therefore already have the equipment and knowledge to grow crops. The plains provide these farmers with ways of producing more feed, so that they can have more animals in their herds.

In the Fricato project, the model is entirely different. It seeks to support pastoral activity for livestock farmers in the piedmont area, who are threatened by the lack of cultivable land. Without a solution to improve their income by reducing costs, pastoral activity in the piedmont area is struggling, and territories are at risk of closure.

Of course, this is not about opposition between models of complementarity seen through the filter of the actors concerned (“mixed crop-livestock farming – plains agriculture” complementarity, versus “small mountain pastoral farming – plains agriculture” complementarity). Given the extent of land abandonment in the lowland viticulture zones, as in Pyrénées-Orientales, we could undoubtedly envisage a regional coexistence of these models of livestock-crop complementarity. *Here, we wish to emphasise the differences between these two schemas, in terms of territorial development at regional level.*

It is useful at this point to bring in the concept of a common good (Orstrom 1990; NSS, 2012). In the case of plain – mountain complementarity with a double objective, the activity of piedmont pastoral farmers might be considered a common good. The benefits of their work extend beyond their activity and can be appreciated by society as a whole (for example: production and protection of landscapes promoted by local labels, maintenance of social activities in these territories, the mutual enhancement of different geographical zones in the department, etc.).

The move from the model to its integration within a territorial dynamic goes beyond sectoral questions, and also brings in political factors: Which projects are suited to which territories? For plain and piedmont areas?

Ultimately, there is a political choice to be made, on the national, regional and local levels. For the plain – mountain complementarity system to work and be sustainable, with the dual objective of relaunching diversified agriculture on the plains and supporting pastoral activity in piedmont areas, it is necessary to consider, from the start of the project,

<sup>12</sup>AFP GP: Pyrénées-Orientales Pastoral Land and Pastoral Groups Association

the conditions that are indispensable for its success, by integrating the two functional entities: the plains and the mountains. In other words, these land rehabilitation projects are often led by stakeholders from the peri-urban plains. These project leaders mostly focus on the plains (the constraints to overcome, the means required, the organisation to federate, etc.). However, the schema here is not one of providing an environmental service. We are trying to create resource synergies between distant and contrasting rural and peri-urban territories. The system must be based on a consideration of the conditions that support activities in both territorial entities. Crucially, this means that the reflections underlying these projects must also take into account what happens in the mountains and in small piedmont farms (the conditions required to allow livestock farmers to participate).

## CONCLUSION

Creating synergies between the plains and the mountains to support agricultural activities and agro-ecological transitions in these contrasting territories is a difficult task. The Fricato pilot project shows that this kind of initiative could be sustainable, and that it meets the different needs expressed by the diverse stakeholders. This form of multifunctionality is based on re-establishing connections between the coast and inland areas, and between rural and peri-urban zones. It is defined by a set of technical, economic, environmental and social expectations and dimensions. These dimensions must be taken into account in a complex system that allows them to be combined in a coordinated way, and allows collaborative management of interactions. The Fricato project shows that a joint collective action initiative can be introduced and can work. However, the analysis of the first years of operation shows weaknesses that might jeopardise the success of this kind of project. The questions of facilitation for land access and land issues on the plains, of equipment needs, of property rights and finally of the conditions for accessing agricultural support are major limitations. The resolution of most of these problems is not solely down to those concerned within the scope of the project. They must also be approached on other levels, bringing in other actors and institutions. This case study demonstrates the invention of new agricultural models, and renewed solidarity between territories at regional level. The transition from the pilot development project to the creation of plain-mountain complementarity projects raises the issue of political support for projects of this kind, and the measures provided to support their emergence.

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RMT SPYCE: <http://www6.inra.fr/systemesdecultureinnovants/>

Livestock farming and territory permanent seminar: <http://umr-selmet.cirad.fr/seminaires/seminaire-permanent-elevage-et-territoires/presentation>

**ANNEX 1: PASTORAL LIVESTOCK FARMING IN THE PIEDMONT AREA: KEY CHARACTERISTICS**

The sheep farmers participating in the Fricato project have their holdings in the Canigou piedmont area, at an altitude of 500 to 1400 meters, in neglected zones between the valley and summer pastures. The set-up is based on a heavy investment in terms of work, but very little capital investment. They often have very little equipment and materials. Their flock size is small (100-150 sheep). The available surfaces are essentially pastoral (moors – woodland), sometimes with a few natural meadows on the moors.

- 100 to 200 sheep
- 80 to 150 ha, essentially pastoral land and woodland.
- 0 to 15 ha of natural meadows
- 1 labor unit
- Little material and equipment on the farm
- Little land owned
- Annual hay requirement:
- Annual grain requirement:



The flock is mostly fed by pasture grazing from April to December.

Lambing season takes place in late spring, so that the flock’s production period coincides with the grass growth period. The lambs are weaned in early summer, before the ewes go out to graze in summer pastures. Since the sheep farmer has little land suitable for cutting or crops, most of the winter feed (hay) given to the sheep and the additional feed given to the lambs (hay and grain) is bought.

**Example flock management calendar**

						Lambing			Sale of lambs			
Month	10	11	12	1	2	3	4	5	6	7	9	
										Summer pasture		
Woodland-moors	Moors Woodland		Chestnuts	Rangeland (leaves)			Moors Woodland					
Meadows	Move to meadows					Move to meadows						
Hay			Hay 1 meal		Hay: 2 meals		1 meal					

NB 1: Putting sheep out to graze pastures from January to March as indicated here is only possible if there is no snow.

NB 2: Not all holdings have cut meadows.

For further information: typical meat sheep scenario “Ovin viande en reconquête pastorale” 2014-2015 situation- reference collection- INOSYS livestock farming networks. 8p.