

# THE BIODIESEL PRODUCED BY FARMERS AT A LOCAL SCALE USING A TRADITIONAL PROCEDURE: WHAT KIND OF TERRITORIAL CONSTRUCTION FOR AN AGRO-ENVIRONMENTAL PROJECT IN SOCIAL ECONOMY?

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Received 27 August 2008; Accepted 29 May 2009

**Abstract:** Recently, in France, some farmers have decided to develop traditional farm biofuels, through the production of pure oleaginous oil. This production requires the acquisition of small colza and sunflower oil presses, which gives rise to the pooling of resources between farmers in local cooperatives (the CUMA). This type of structure reveals a will to privilege agricultural autonomy rather than increasing production. It plays a large part in social economy or non profit projects. This local and traditional procedure, largely disconnected from the industrial oilseed rape production, is carried out, in the north west of France, by cattle breeders who try to produce their own farm oilcakes and save energy. There is no need to devote much land to the production of colza to reach their objectives and they are not in competition with the biofuel industry. These local projects are based on the principles of co-construction between the farmers, the CUMA movement and the agricultural organizations and institutions. We must define the reality and explore the significance of the co-construction process in these agro-environmental and territorial projects.

**Key words:** Biofuels, sustainable agriculture, agro-territorial project, farming and local development, territorialised actors, co-construction, territoriality, territorialisation

**Résumé:** Depuis, peu, en France, des agriculteurs, principalement des éleveurs dans l'ouest de la France, cherchent à développer la production de biocarburants fermiers; par la production d'huile végétale pure. Cette production fermière nécessite l'acquisition de nouveaux outils, des presses à huile pour le colza et le tournesol, d'où le rôle du mouvement coopératif "CUMA", qui soutient ces agriculteurs cherchant l'autonomie alimentaire (production de tourteaux pour le bétail) et énergétique. Peu de surfaces en colza ou tournesol sont nécessaires pour cette production et les buts d'autonomie agricole l'emportent sur la recherche du profit ou la diversification des revenus. Ce projet est porté par les structures de l'économie sociale. Il n'y a pas de compétition avec la filière biodiesel; les objectifs ne sont pas les mêmes. La géographie du pressage de l'huile végétale pure est en décalage par rapport à celle de la filière

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grande culture céréalière et oléagineuse traditionnelle. Ces projets locaux sont co-construits entre les agriculteurs, le mouvement CUMA et les institutions agricoles. Comment ce processus de co-construction s'élabore-t-il et se matérialise-t-il dans la mise en place de projets locaux de développement agro-environnemental ?

**Mots-clés** : bioindustries, agriculture durable, projet agro-environnemental, autonomie agricole, acteurs territorialisés, co-construction, territorialité, territorialisation

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## 1. Introduction and context

This topic questions the territorialisation mechanisms of agricultural projects with a strong environmental orientation. It centres on the example of the production of traditional farm biofuel, made from pure pressed plant oil, within specific cooperatives that, in France, are called "CUMA". This production requires the purchase of oil presses by farmers from the same neighborhood, who mutualize their resources. The CUMA is the appropriate structure because it's a local cooperative for the pooling of technical agricultural resources. This production is the result of a deep reflexion on the part of the farmers on the different ways to achieve their agricultural autonomy: by producing their own energy as well as their own cattle feed, so as not to be dependent on agro-business. It's also an agro-environmental project for sustainable agriculture and local development. The production of farm oleaginous oil has been taking place in the recent context of great enthusiasm for agricultural fuels. This theme has been promoted by the European Union policy since 2003, which aims at an 8% reduction of greenhouse gases by 2012. France has decided to anticipate these objectives by developing the biofuel industry with the French trademark "Diester Industries". It is in this general context of the promotion of all biofuels that the production of pure traditional or farm oleaginous oil has created a keen interest within the "CUMA" movement. Oleaginous oil can be produced directly by the farmers, in a traditional procedure, or on an industrial scale, by the biofuel industry. In the first case, the oleaginous oil, mixed with up to 30% diesel, can be used for relatively old tractors and can also be used in furnaces for heating. In the second case, the farmer is simply an oilseed rape or sunflower producer: he provides the cooperative or the industrial manufacturer with this raw material to produce the oleaginous oil, a product which is transformed into biodiesel by a process of esterification (Ballerini, 2006). In both cases, the production of biodiesel generates a derivative product: the oilcake<sup>2</sup>. In the farm oleaginous oil production, one could in fact say that the oleaginous oil-fuel becomes a derivative product of the oilcake. Every hectare cultivated gives 800 liters of pure oleaginous oil and two tons of oilcakes. We shall show that the local development aspect proves to be, for the actors involved, far more significant than the engagement in a path of production because these breeders do not need important quantities of colza (3 ha on average by producer) to manufacture the pure plant oil and the oleaginous oilcake to feed their livestock.

Why focus on agricultural matters and on this geographical space? The CUMA are present in all the French *départements*, and 50 have at least one CUMA "for oil pressing". There are 80 oil presses in the CUMA movement in France, for about 2500 users in 2006/2007. There are 12,700 local CUMA in France (a CUMA can be founded with as little as four members) and 236,000 members (out of 450,000 farmers in France in 2005). 50 000 of the CUMA movement members are located in the three Western regions (*Bretagne, Pays de la Loire, and Basse Normandie*). In each *département*, a federation groups the members together.

As agriculture is a sector of activity in which the organizations of the third sector play an important role, our reflexion centres on agriculture to consider the ties between social economy and territory, in line with the works of Parodi (2004). We will try to understand the conditions of the construction and territorial appropriation of agro-territorial projects by the structures of social economy and its actors. How can this initiative of local, environmental and agricultural development mobilize the social economy structures and what are the modes used to elaborate the projects and their territories? One can use the term co-construction (Guigou J.L., 1998) for this type of project within cooperatives, actors and *départemental* federation of the CUMA,

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<sup>2</sup> In livestock food, and considering the nutritional capacities of the different products, one can substitute 1 kg of soy bean by 1.5 kg of colza, to feed the bovine, dairy cows and bull-calves.

*départemental* council of agriculture. What are the links between this farm production and the industrial production of oleaginous raw materials?

## 2. Methods

This work takes part into the framework of a research conducted, in the west of France, for the DIIESSES<sup>3</sup>; "Regarding social innovation and the development in social economy, what are the ties between social economy, territories and networks? (Thareau and al, 2007). Two fields have been explored: personal services and agriculture, which correspond to two activities that are traditionally covered by social economy. This work united 7 researchers from different disciplines: geographers, administrators, sociologists, researchers in communication (Thareau and al, 2007). This article is taken from the work that I have personally carried out in agriculture: the CUMA « oil press » in the French *département* (NUTS 3 in the European Union) of *Maine-et-Loire* was the first in France for the importance of its production and for the quality of the products and has been a reference for the other cooperatives of other departments. In fact, this case study is an example that can be observed in many other CUMA in many *départements*, in the western part of France, where most of the producers are cattle breeders. That's why 13 CUMA in 13 French « *départements* » have been studied with the help of a statistic survey and interviews with the heads of the CUMAs of each department.

My research began with a compilation of, sometimes scattered, statistical data, on the oleaginous production and on the production of pure plant oil in CUMA at the national, regional, *départemental* and even local level. This data emanated from various organisms (ONIGC and SCEES in the case of oligeaginous production, which are french statistical organisms in agriculture). A bibliographic research has been conducted on farm biofuels, on pure plant oil, and on works completed on the *départementale* oil press of the Maine-and-Loire: Nathalie Noah (2006), surveys from B. Chanudet & Sylvain Judéaux, (2007).

Thirty two actors have been surveyed and interviewed, in the *département* of the Maine-and-Loire (15), but also in the neighbouring *départements* of the west of France (*Bretagne*, *Basse Normandie* and *Pays de la Loire*) and of the region *Centre* (FD CUMA<sup>4</sup> of the *département* of Indre, 4 interviews), in the FR CUMA and in the FN CUMA<sup>5</sup>. It consists in biographical interviews (15 people) and surveys conducted in framing institutions, in order to obtain information regarding the development of these tools. In each *département*, we have observed the similar mechanisms of territorial co-construction and the main role of some actors able to interconnect different networks of farmers, thus allowing them to give a wider importance to these projects. The case study conducted in *Maine-and-Loire* is really significant.

The *department* oil press was set up in 2008. It was the biggest farm oil press within the CUMA movement in France; it has been really appreciated for its production capacities and the quality of its products. It was considered at first as a technical model in many other *départements* even though some had experimented before more modest tools (*département* of Mayenne); the comparison between *départements* and their CUMA, between tools and the setting up of different projects, is helpful to understand the co-construction process of projects and their territorialities. Some stakeholders were interviewed in the *département* of Maine-and-Loire (15), some of them twice. Each time, it lasted 1h30 to 3 hours. The aim of the interviews was to grasp how the projects were constructed; the role of the different local actors (agriculturists, framing structures, institutions); the viability and the territorialities of the project and the evolution of the intentions of each actor. The interviews took into account two categories of interviewees. The technicians or stakeholders (FD CUMA, *départemental* agricultural Council and its local antenna in Layon-Saumurois, and the local territory of the Layon) were questioned on the role of their structure in this project. The interviews conducted on farmers (mainly focusing on farmers as leaders) took into account their multiple roles. Some were involved as farmers directly interested in the project, others as trade-union representatives of the *départemental* council of agriculture of Maine-and-Loire, (it exists in each *département*), or farmer representatives in the FD CUMA council and, in these cases, they are not necessarily users of the farm oil press.

<sup>3</sup> DIIESSES: interministerial delegation for innovation, initiative and social economy.

<sup>4</sup> FD CUMA : *Départementale* federation of CUMA.

<sup>5</sup> FR CUMA and FN CUMA are, respectively, the regional (nuts 2) and the national (nuts 1) federation of CUMA.

### 3. Agriculture, territory and agro-environmental projects in ESS: what are the reflexions?

The reflexion on the role of the CUMA movement is part of a larger reflexion on the role of the third sector economy in agricultural and territorial development. Historically speaking, agriculture is an activity sector structured by the social economy organizations (cooperatives based on production and purchasing, the pooling of agricultural means and tools). The CUMA have played a major role in the evolution of agriculture over the last 60 years, accompanying the agricultural productivism during the years 1960-1990 (Carnet P., 2005). They facilitated agricultural modernization and mechanization, within a family agriculture, by increasing the technical training of the farmers and promoting collective progress through the group acquirement of efficient tools. Today, the CUMA movement encourages the promotion of new agricultural practices. Its agro-territorial projects are more oriented towards landscapes and sustainable agriculture: the maintenance of groves and hedgerows, firewood heating and biogas production. It is interesting to observe the role of these cooperatives in the spreading of agricultural innovation (Assens P., 2002).

We put forward the hypothesis that, in these social economy projects, the actors are co-constructors of the projects and of their territories, because of the very nature of social economy (Jeantet T., 2006 and Lipietz A., 2001). The principles of ESS (social economy, non-for-profit organizations, third sector or non profit sector; Powell and Steinberg, 2006) are: a free collective initiative; power within its structures based on the principle "one man, one vote" and not on the holding of capital; collective property freely chosen, in partial or total indivisibility; independence in relation to the State structures. It also corresponds to particular legal structures: friendly societies, cooperatives, associations (Nyssens M., 2006) created to answer local social needs. The search for profit, though not completely excluded, is not the main objective (Lipietz 2001, *op.cit.*).

To understand the mechanisms of the territorialization of the projects in social economy, we must consider the links between the territory of these structures and of their members, through the representations and the strategies of individual, institutional and collective actors (J.P. Dupuy, 1999). According to Laramée, (1995) and Pecqueur (2004) who lead a reflexion on the articulation between economic activities and territories, as well as Lévy J. and Lussault J.L. (2003) and Di Méo G. (1996; 1998), territory is both a social construction, animated by a feeling of collective development shared by its inhabitants and a framework for administrative management (Brunet R., Ferras R. & Théry H., 2005). It is a space endowed with limits, organized (with charter, regulation, legislation) or animated by a social group, and it is recognized by its inhabitants (Raffestin, 1986). However, we make a distinction, in this survey (Thureau and al, 2007, *op.cit.*), between two shapes of territories: territories defined by the intervention of the administrative structures (that have, in this case, *départementales* limits) and territories defined by a partnership (in the case of the CUMA members), which corresponds to the territorial enrollment of the actors' network. In both territories, we consider the importance of the proximity (Piolle X., 1991), which can be as much a territorial proximity as an organizational one. There are weak hierarchical links between actors and members of the association, of the cooperative or of the friendly society. The idea of (a) reciprocity between actors, following a logic of parallel development of social economy structures and of the projects' territory, echoes the notions of coproduction presented by J.L. Guigou (1998, *op.cit.*) : the territory is considered as a collective production associating the contributions of the State administration, the local collectivities, and the citizens. Tizon (1993) explains that the territory is first a social and collective construction, in a process of co-production, associating the framing structures, the local collectivities and the citizens. The common and parallel development of the structures and of the projects, and the logic of territorial coproduction, define the notion of co-construction used in this article.

The articulation of network and territory needs to be clarified, even though, nowadays, most geographers refute the thesis of the dematerialization of the territory by the networks: networks and territories articulate each other (P. Musso, Y. Crozet and G. Joignaux, 2002; J.M. Offner and Denise Pumain, 1996). Musso, Crozet and Joignaux, (2002, *op.cit.*) invite us to consider the projects, the uses and the practices of the users of services (like the members of a CUMA), in order to grasp the effects of the territorial networks. However, the territorial networks which

we are interested in, are networks of actors. There can be two sorts of networks: cooperation between individuals (users, citizens) and relations between organizations, institutions, associations, cooperatives and friendly societies. The actor, individual or collective, is situated within a geographical and economic space and elaborates his strategy according a number of elements: the context in which his action takes place; the power and the resources he has at his disposal and his place in the system of negotiation (Gilly, Leroux and Wallet, 2004). The actor may sometimes enroll himself in networks that are a-territorialised, but in this agricultural and local project, we consider that the actors are strongly territorialised (Gumuchian and al, 2003). The territorialised actor is driven by intentionalities and territorialities and has a project for his territory, a project that can be formalized as follows: "all individual actors who participate in a purposeful way in a process that has territorial implications" (Hervé Gumuchian, Eric Grasset, Roman Lajarge, Emmanuel Roux, 2003, p. 110, *op.cit*).

Finally, this project of pure plant oil production by the farmers is part of a reflection on agricultural autonomy, which is itself inscribed in the post-productivist agricultural transition (Armesto-Lopez and Loïs-Gonzalez, 2007; Ilbery and Bowler, 1998; Wilson, 2001). Recently, many works have attempted to define and to conceptualize what the post-productivist transition is (Jay M., 2004; Bendiktsson K., 2000). This definition can be linked to local conditions, but it also represents a new attitude towards agricultural practices, new rural governance and environment (Wilson G.A., 2004), a more integrated and participative reflection on agricultural development in rural projects and territories. X.A. Armesto-Lopez and R.C. Loïs-Gonzalez (2007, p 21, *op. cit.*) define post-productivism as follows: "*a production system based on the research of the differences in relation to the conventional systems; these differences consist of a better respect of the environmental prescriptions, as well as the rediscovery of the local economy, permitting to unite the production and the territory for a better quality*". These definitions include the reflections of Ilbery and Bowler (1998) on the post-productivist transition, as well as those of G.To. Wilson (2001), in the present definition of a "multifunctional agricultural system" demonstrating the coexistence of productivism and alternative systems. Since the 1990s, the CUMA movement has encouraged the promotion of new agricultural or agro-territorial practices. The CUMA movement has been involved in both the productivist period and the post productivist transition.

#### **4. The farmers of the west of France and the development of new agro-environmental projects in CUMA**

In France, two organisms with a role in research and agricultural framing have initiated this promotional movement of farm biofuel: the CIRAD (French Center for International Cooperation in Agronomic Research for Development), working overseas or in tropical countries, and the CUMA movement. The case study on the setting up of the *departmental* oil press in CUMA, in Maine-and-Loire, must be considered in the larger geographical context of the west of France, and in the economical context of the great interest for the oil presses and the production of pure plant oil in CUMA.

CUMA doesn't have the monopoly on the use of the oil presses by the farmers; the survey has been limited to this network because it is an example of a short path to follow, of which the information is relatively easy to access (sources FD CUMA, FR CUMA and FN CUMA). Indeed, an inventory of oil presses for pure plant oil doesn't exist anywhere other than within the CUMA movement. Oil presses manufacturers could be solicited for information, however their number renders it difficult to identify all of them. Most of the manufacturers are German, (Bertrand, 2007) and they don't only supply to agricultural producers. At the same time, it shows the importance of the CUMA in the emergence of agro-territorial and innovating projects of local development.

In the west of France, the role of the CUMA is important. One can explain it by the effects of the farming professional movements that since the 1930s have been, greatly impregnated by the ideology of the JAC (Christian agricultural youth), extolling values of cooperation and solidarity between producers in a modernist evolution. In 2006, more than 50% of farmers in *Pays de la Loire*, and more than 60% of those in *Maine-and-Loire* belong to a local CUMA (FN CUMA, 2006). The interest of the CUMA movement of the west of France in the oil presses and the production of farm oleaginous oilcakes and pure plant oil is remarkable. There has been an

increased demand for and interest in these new tools since 2003/2004. According to the national federation of the CUMA movement (September 2007), the CUMA movement in the west and southwest of France was the first to have initiated the use of this kind of tool in France, and the level of equipment, set up in 2005/2006, is now very good. In the west of France, in 2003-2004 the pioneers were local actors; now we can observe installations with a greater economic dimension (semi-stationary facilities in 2006 in *Maine-and-Loire*), favouring an important capacity of production and a good quality of product.

## 5. Co-construction and co-production of the project and its territory

The way in which the project emerges and in which actors get involved conditions their territorial engagement, in a logic of real co-construction and territorial co-production. The CUMA, which is a local cooperative, is often the first step to implementing the professional network of farmers, notably in the west of France and it interconnects farmers situated in different "agricultural practice networks" on the same territory. The example of *Maine-and-Loire* shows that the reason to be of the CUMA federations is to answer localized needs: farmers of a local CUMA (CUMA du *Layon*) solicited the FD CUMA and the *département* framing structure of agriculture, even though they were not big producers of oleaginous plants. The production of pure plant oil in CUMA represents less than 1% of the total surface areas in oilseed rape for each *département* in the west of France, where each member presses the equivalent of 1.5 to 4 ha.

The co-construction includes the way of structuring the actors' network: communication and exchanges of information, coordination and construction of a formal network. In these social economy projects, it reveals the capacity of the CUMA movement to value the members' initiatives, promote their collective professional training, and give them the capacity to implement other development dynamics, meaning the importance of the actors' involvement in a cooperative project (Barraud-Didier V. & Henninger M.-C., 2007). Between the emergence of agricultural autonomy projects in the local CUMA in *Layon-Saumurois* (acquisition in 2003 of an alfalfa drier for animal feeding) and the setting up of the *département* oil press, 2 years passed by, which seems little, as the oil press is a prototype for its technical capacity, its quality of production, and its semi-mobility. During 2005, there were many meetings bringing together farmers, local administration of agriculture and the *département* federation of CUMA. Farmers conducted the meetings and they pushed for the achievement of the project. However, the technicians were more cautious, or even sceptical "*The farmers have created the movement, the motivation, and the institutions had to follow them: It is not so frequent in agricultural development.*" (agricultural technician, interviewed in, May 2007). Therefore, the projects on this tool have been carried out, in all the western part of France, which is not an important oleaginous production region, by breeders who try to give more economic autonomy to their exploitations with the lowest energy expenditure possible. They are not in line with the usual production of industrial oilseed rape "They don't deal with the oilseed rape industry" (One farmer-leader interviewed in February 2007).

## 6. Territoriality, territory and territorialization

The setting up of this project articulates networks and territories at many levels; the networks of social economy and agriculture actors; the agricultural territories (systems of production), the institutional territory of the *département* federation of CUMA, the territory of intervention of framing structures and, according to Offner & Pumain (1996, *op.cit.*), the "reticular" functional territory, that is to say the territory of partnership between actors.

It is interesting to confront the territory of oilseed rape and sunflower production, the localization of the CUMA members, the particular territoriality of the oil-press (its semi-mobility) and the dominant territorialisation in *Layon-Saumurois*. The spatial patterning of the tool achieves a compromise between the *département* perimeter (the FD CUMA and therefore, potentially, all farmers of the *département*), the *département* CUMA "innov-expé", which is the institutional setting up of the experimentation and the use of the machine, and the network of members, who can be simple farmers, local CUMAs or local communities. The two townships with the most numerous members in the *Layon-Saumurois*, are also those where the initiating actors of the project reside. However, the context of farming land-use and the systems of production of the members has an effect too. The *Layon-Saumurois* (map 1), in *Maine-and-Loire*, represents



one of the sectors in the west of France where oilseed rape culture is important, but the initiators of this project are cattle breeders who are not interested in an industrial outlet for the oilseed rape they produce. The project conceived within the CUMA is considered as a local development project, not as an oilseed industry project. The farm and cooperative dimension, with the importance of the pooling of local needs, defines a specific territorial construction that would not have been possible in the case of an industrial logic of the production of biofuels.

Finally, the working of the project finds its pattern in a particular spatio-temporal construction due to its "semi-mobility". The oil press has made available to the CUMA members in 5 to 6 pre-established stations in the *département*. The itinerary and the choice of these stations correspond to a balance between the institutional framing (in order to "cover" the whole *département*, the territory of intervention), and the spatial distribution of the members (territory "of action and use"), taking into account the local capacity of production, the systems of production, the localization of farmers who are able to receive the machine (they must have a large shed permitting a shelter for the machine and a sufficient electric installation), to assure the control of the tool (farmers who have been trained to use the machine by the FD CUMA) and the transportation of it. The tool must remain at least one week, due to technical reasons, transportation costs and setting up time, and it may stay up to one month, in *Layon-Saumurois* notably. The sites must be at a distance of less than 25 to 30 kilometers from each other.

## 7. The role of the territorialized actor

The territorial patterning of the project is linked to the influence of a particular actor, an actor who is situated at the heart of the overlapping geographical scales, connecting territories, structures, and networks, for a project that is intended to be a local project in *Layon-Saumurois*. The role of the territorialized actors has already been evoked (Gumuchian and al, 2003, *op.cit.*). Here, the person who is responsible of the agricultural commission of the territory in the *Layon-Saumurois*, a local leader, has succeeded in federating farmers locally. He has contributed to the setting up of a *départemental* tool but his ambitions, his projects and his actions, take place on a "local scale" (the *Layon-Saumurois*). He displays coherent intentionalities on the environment and the local development, well beyond the project of the farm oil press. In the interview, he speaks extensively (more than 20 minutes in a 2 hours interview) about his role as President of a local commission for water, assigned to elaborate a SAGE (program for the local and environmental management of water: *SAGE Layon-Aubance*). His commitments reflect his territorialities (above all local) as well as his intentionalities (environmental approach) (interview, February 2007).

This project takes a *départemental* dimension thanks to the strategic and technical choice of the farmers who initiated the project in *Layon-Saumurois*, in partnership with the institutions (like the *département* federation of CUMA). The need to build a tool of the right technical, economic and qualitative dimension, forces to produce beyond a local scale. Two years went by between the moment when a project of pure plant oil production was evoked in the general assembly of the CUMA in *Layon-Saumurois* and first contacts were made with the FD CUMA (early 2004), and the creation of the prototype machine (October / November 2005). The oil press project has been integrated in the "CUMA *départemental* of innovation and experimentation in mechanization" since the beginning of 2005. It met with immediate enthusiasm from the farmers of the *département*, informed by the CUMA network, the trade-unions and the local agricultural press. The determination of the initiators of this project is part of a local development dynamic that becomes a *departmental* project thanks to their will. This local will emerges at the same time as a growing interest on the part of farmers of the whole *département* for projects on energy and farm biofuels. However, there has been a real local appropriation of the tool by the farmers in *Layon-Saumurois* and it has materialized in the choice of a local constructor and in the inauguration and the experimentation of the oil press by one of the two farmers who initiated the project in *Layon-Saumurois*, and who stocks the oil press during the off-season. Nowadays, the re-territorialisation in *Layon-Saumurois* of an oil press with a higher capacity of production is being envisaged. It could be a stationary tool with a higher capacity of production, than the semi-mobile oil press, and would function outside of the CUMA movement, independently, and reaching beyond the usual institutional limits, in the south-east of *Maine-and-Loire* and the neighboring *départements*.

## 8. Discussion

The link between the oil press in CUMA and the system of production is interesting to observe. We have noticed the existence of a disconnection between an intensive use of the farm oil press and the specialization of the production systems in cash grain farming: in the west of France, the production of farm pure plant oil and oilcakes takes place in systems of production where cattle breeding is dominant. However, the local CUMA gathers a lot of materials which are highly dependent on the dominant production system.

The example of *Maine-and-Loire* is particular due to the technical dimension of the tool (potential production is estimated at more than 300,000 tons, but real production reached just over 200,000 tons in 2007, the first in France according to the FN CUMA); due to its territoriality (semi-mobility) that permits the tool's influence all over the *département*. In most other *départements*, the territorial functioning is different: either the farmers go to a big stationary unit (*département du Calvados*), or they use smaller, highly-mobile tools – they can be transported in a pick-up, or even in the boot of a car – with a capacity to produce a limited quantity of an oil of indifferent quality. In other places (*Loire Atlantique, Ile-et-Vilaine*), several stationary units of intermediate technical production capacity are implanted in the *département*. However, these differences don't call into question the way in which individual actors and framing structures have put this project together: the principle of co-construction proves to be widely shared.

Do the co-construction and coproduction of these tools and products in the CUMA permit a more efficient diffusion of technical innovation? Philippe ASSENS (2002), in his thesis, makes a distinction between two functions of the CUMA movement. Firstly, he distinguishes its role as technical mediation of the farmers's network that serves to acquire complementary skills for the innovating members of CUMA, structured by vertical networks (that is to say strategic ties with the other farming organisms and institutions working on innovation in mechanization). Secondly, he distinguishes the strategic function of mediation that aims at promoting new acquired expertise while transmitting them to local CUMA: it is about a horizontal and not a hierarchical network. However, to articulate these two functions can be difficult. In the case of the diffusion of the oil press, notably in *Maine-and-Loire*, farmers in the *département* can be immediately informed about the setting up of this project by the CUMA network. In most *départements*, farmers have encouraged and motivated the setting up of these tools and have accelerated the technical reflections on them, thus permitting an almost immediate articulation between technical and strategic mediation. Members of the CUMA(s) in the other *départements* came to see the setting up of this tool and how it could work, but they adapted the oil press to their own needs and according to their own technical model, generally with lower capacities of production.

The intentionalities of the production of farm pure plant oil condition the tool's viability. In most of the CUMA in the west France, the quest for agricultural autonomy, sustainable and local development, and local energy provision, is the first incentive for the initiators farmers. Those who look to diversify their agricultural income with pure plant oil may come up against two problems: selling farm oilcakes can be a problem for farmers who are not breeders, (although here this doesn't seem to be the case, according to surveys), as can selling the excess pure plant oil. Some local communities have equipped themselves with furnaces for pure plant oil, but the sale of farm fuel is strictly limited in France, because of the French energy policy, which distinctly favours the industrial biofuels (French trademark Diester). Since 01/01/2007 (French farming law of 2006), beyond the individual use already possible, the sale of farm pure plant oil between farmers and to local communities is allowed, but following very strict conditions. Otherwise, the use of oil-fuel is currently possible only in older generation diesel motors as French engine manufacturers refuse to guarantee the new motors running on farm pure plant oil and this limits its development in a significant manner. The viability of these tools must be considered from different angles: the lastingness of the CUMA structure, of the oil presses as a tool, and of the farm pure plant oil and oilcake production. The viability of the tool in CUMA is based on several factors: the experimentation tools in CUMA are limited to four years due to the obsolescence of the material. The intentionalities of the users are another fundamental parameter. However, one can observe a gap between actor-leaders, generally very interested in the environmental aspects of global energy saving, as well as agricultural autonomy, and most of the members, for whom the short-term economic interest is greater. The studies conducted at the level of the *régional* federation of CUMA "Ouest" (CHANUDET & JUDÉAUX, 2007, *op.cit.*),



of the *départementale* federation of the CUMA in *Maine-and-Loire* (NOAH, 2006, *op.cit.*), and the interviews with the actor-initiators of this project, show that the intentionalities considering biofuel as an alternative to fuel-oil are the most shared by members, but are also the most sensitive to the economic circumstances of the moment : the evolution of fuel-oil prices, the quotations of the dollar and the oil seed prices. According to all the FD CUMAs that have been surveyed (12), farmers pressed less in 2007 compared with 2006, due to the increase in oilseed rape prices. To maintain the interest in these tools, other long-term incentives are necessary. The trituration of oilseed rape remains interesting as cattle feed. According to the national federation of CUMA, these tools have the best chance of surviving in the west of France, where the pure plant oil is produced by breeders using it for the manufacturing of oilcakes. More generally, this question echoes the present debate on the economic and environmental interests of biofuels (SCARWELL, 2007) : the 12 *départements* of the west of France produced 187,500 hectares of oleaginous plants in 2006, but only 1,850 have been used in the production of pure plant oil. In *Maine-and-loire*, only 300 ha of oleaginous plants have been used for the oil press in CUMA (out of more than 20,000 ha of oleaginous plants cultivated in the *département*).

### Localisation of the CUMA members for oil pressing in *Maine-et-Loire*

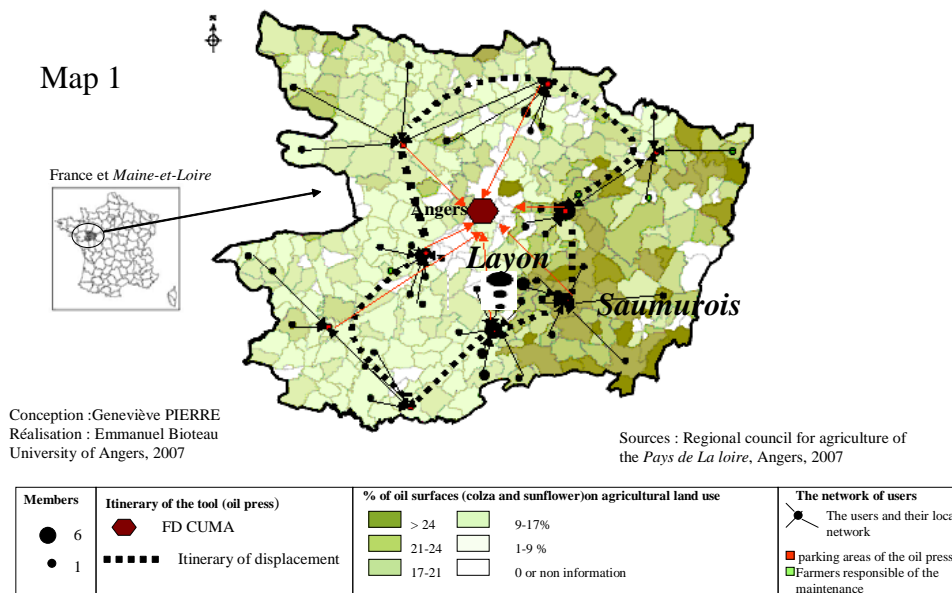


Fig 1. Localization of the CUMA members for oil pressing in *Maine-et-Loire*

## 9. Conclusion

We have formulated as a hypothesis of our work that the actors of the ESS are co-constructors of the projects and their territory. This survey on an agro-environmental and territorial object defines the ways of co-construction of the project and its particular shapes of territoriality or, even, of territorialisation, from the CUMA network. Certainly, the construction of this *départementale* oil press in *Maine-and-Loire* appears in a local and global economic and political context (the question of biofuels and the energy autonomy, the local and national public policies on the subject) involving the local farming land, its potential and its needs in raw materials. In the same way, the spatio-temporal measurements of the construction of this project can be explained above all by the role of the territorialized actors, with their respective intentionalities and territorialities, associated in a collective project, in the *département*. The reflection centered on the territorialized actor allows us to consider several measurements of the co-construction of the project and its territory of action: from mid 2004 to the end of 2005, the reflection on the setting up of the project and the opportunity, the relevance of its geographical basis and on its economic size, have inevitably led to a reflection on its "territoriality". This project takes on a *départemental* dimension thanks to the strategic and technical choice of the farmers who have been the local initiators in *Layon-Saumurois*. However, this example of co-construction has been reproduced in different *départements* and

has constituted both a model and an exception: a model because the technical tool has been built collectively, by a collective will and a training of farmers. Nevertheless, the size of the tool, its exceptional capacity of production in France and the quality of its products (pure plant oil and oilcakes) have generated widespread curiosity. However, an exception because it remains a prototype, limited to 4 years (until 2009) and we should point out that each *département* has chosen its own technical solutions. In the end, the *Maine-and-Loire* model has rarely been copied, given its cost (financing) and the rigorous management that it requires. Will these very big farm tools last longer than the smaller ones ? What can the viability of these projects be once the first four years have passed ? Does it depend on the intentionalities of the users, be they breeders or non breeders? And what shape will this take? Co-ownership? Local CUMA, *départementale* CUMA? In the case of *Maine-and-Loire*, the actors of *Layon-Saumurois* chose to build their own local "stationary tool", but with an influence beyond the limits of the *département* and outside of the CUMA structure. Their aim is to re-territorialize in *Layon-Saumurois* the *départemental* tool that they contributed to create. They have seized the opportunity created by the implementation, in France of the policy of the "excellence rural poles", since 2006, promoting notably renewable energies. Henceforth, other *départements* or local territories have followed their example, particularly in the west of France. The process of the territorial re-construction of these tools, the transition from the CUMA structures to "excellence rural poles" should be interesting to observe.

## Acknowledgements

We gratefully acknowledge the support of this research provided by the DIISES (French Interministerial Direction for Social Economy), the CRES Pays de la Loire (Regional Council for Social Economy) and all the colleagues who have participated in the collective research of the programme « ESSTER » (social economy and territorial construction): Bertille Thareau, Valérie Billaudeau, Emmanuel Bioteau, Sébastien Fleuret, Isabelle Leroux et Laurent Pujol. Special thanks to Ann Wilkinson and Anca Bioteau who accepted to re-read this article in English. Additional thanks to the two anonymous reviewers of this journal.

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