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Latest evolutions in the process of the ecologisation of agriculture in Wallonia (Belgium)

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Our text deals with the implementation of environmental management plan at farm level in Wallonia (Belgium). Several kinds of such plans are developed in France and aim at assessing and helping the ecologisation of the farmers practices. Such a tool (mix of questionnaire, software and maps) can be considered as an intermediary object (Vinck, 1999) which not only induces interactions between farmers and people involved in nature protection but it is also a kind of micro-modelisation of the agriculture-environment relations (Jeantet, 1998). This analysis shows several expectations of both these two partners that are not taken into account by the legislation:

- importance of territorial dimension as much for the materiality of the evolution of the farmers practices as for the different scales of actions : from the parcel level to the regional level.
- necessity of a personal relation between the farmer and a person who is in charge to adapt environmental preoccupations. Positive evolution of relation between agriculture and environment mostly depends of the existence and of the quality of this relation.
- anticipated evolution of European and international legislation about agriculture.

We will evaluate the possibilities of adaptation of the farmers and of the nature conservationists in a context of great complexity and we will wonder if this object is really intermediary between farmers and protectionists or rather a message sent to the administration

Introduction

As most of agri-environmental schemes in Europe, the first Walloon scheme settled in 1996 was based upon the willingness of the farmers to participate. This scheme was a sort of catalogue of measures in which the farmers can choose. The success of the program is assessed by the number of farmers implicated or by the agricultural area under contracts. To achieve it, there is a need to enhance the farmer's participation in order to improve the number of measures applied. On the research level, farmer participation was studied in several conditions and most of the studies underline the diversity of factors involved. Environmental perception of the farmers, their values, their knowledge are many inner aspects that can influence the farmer decision-making but social elements like networks (professional, regulation, technical,..) organised around the farmers (Falconer, 2000; Mormont, 1996) also influence the decision.

As all these aspects seem very complex, administrative managers tend to focus on the financial aspect to lead the farmer to subscribing some agri-environmental measures. In order to stimulate farmers to reach the agri-environmental scheme, policy-makers are tempted to

promote measures that they think can be easily accepted by the farmers, as to say : with positive financial profitability, with low risk on productivity and which engage few practices changes. On the other hand, as more money is spent on agri-environment, more positive environmental effects are expected by naturalist and by the whole society. So policy-makers are faced to choose between implementing measures easy to subscribe and others more based on environmental efficiency. The choice between these two extreme points is very difficult because of the lack of knowledge about what each measure implies for the farmer in term of constraint, risk and new skills. So there is a need for new tools that allow to improve the environmental efficiency of agri-environmental program. We make the hypothesis that the management plan acts as an intermediary object putting together different persons so they can adapt each other. Such a tool can be considered as an intermediary object (Vinck, 1999) which not only induces interactions between farmers and people involved in nature protection but is also a kind of micro-modélisation of the agriculture-environment relations (Jeantet, 1998). That means that observing the plan construction gives to us elements or understand this relation.

Plan management description

The agri-environmental scheme in Wallonia is assessed in the framework of a program called EVAGRI (agri-environmental measures assessment). The EVAGRI framework put together some members of the administration, some scientific experts often coming from agricultural sciences but also from ecological sciences, and a coordinator with an agronomic background and involved in ecological studies. This program is engaged in thoughts and studies about changes to promote in the agri-environmental policy in order to improve its environmental efficiency.

This work is based upon the follow-up of this EVAGRI program for 4 years with assisting some meetings and a regional colloquium, reports readings, private interviews. This participation was completed by farmers interviews as we was asked to be expert in 3 missions : how people who have in charge to promote these measures (the advisers) stimulate the farmers participation, why farmers quit the late cutting measure, and the recent one about testing a management plan at the farm scale. This committee undergoes several transformations in its composition but also on the options that are taken. In the former regulation, all the measures can be chosen by all the farmers. On the other hand, according to the new regulation a positive assessment of natural richness of the parcel can provide some farmers an access to peculiar measures or to a financial bonus. Another modification undertaken is the implementation of a management plan at a farm scale. The farm level is put forward in many agri-environmental experiences (in France for example many farm level assessments and schemes are available). The Swiss assessment program enhances the farm level to be a crucial tool in the agri-environmental implantation process, in order to see how to “integrate the proposed management change into functional and individual wholes of unities of the farms” (Bosshard, 1997).

A plan management represents a technical and a human help to promote improvement of the environmental impact of the agricultural practices. Plan managements are usually composed of a diagnostic phase and a proposal phase (Roosen & Devos, 2002). Several diagnostics approach at a farm level are used in Europe on different objectives (see for example (Braband et al., 2003)). The management plan described here had the specificity to include a large range of farm aspects. As it is in a test phase, the final prescriptions are not already known. At the moment, the farmers who are involved in the management plan are at least interested in agro-environment, so the question here is how to go further and be more effective with them.

This management plan is made at the same time of data collection and data treatment. These elements are separated in three elements and at least three meetings with the farmer.

The first element is a detailed questionnaire, completed during the first meeting with the farmer. This questionnaire is collecting data about all the lots (how they are used, how much manure are bring each year, ...), all the herds (age, litter, ...) but also about some practices which are at the same time good management of the farm and environmentally friendly like winter leguminous culture (good agricultural practices or GAP). Answers to these latest questions are evaluated from 0 to 3, these practises can be considered as easy to apply because there both are good for the farmer (for the quality of soils and his welfare) and the environment. The last part of the questionnaire makes an inventory, with a map help, of the naturals elements within the farm: ponds, hedgerows, isolated trees, rivers banks, forests edge,...; which can be counted in surface, length or numbers.

The second phase, data treatment, is made outside of the farm, by scientists or advisers. Two treatments are made. The first one with a software (PAEXA) which gives quantitative results in expressing good results and bad results about biodiversity, nutrient management, pesticides management, or good agricultural practices application.

Another data treatment, the territory diagnostic, is based on the map and assesses the farm score within several environmental parameters: ground water supply, Natura 2000, protected areas or natural parc. These results are translated into recommendations to farmer.

The third phase leads the adviser, meeting at least two more times each farmer, to show the farmer these results, explain them and suggest some actions choose in the agri-environmental measures catalogue or among other practical actions granted or not (some huge investment can be financed through others programs). None of these proposals is compulsory.

Discussion

In many management plan, the software is considerate to be the main element. What we observe here is the importance of three others elements: the questionnaire, the maps and the adviser.

Two-direction information

Both the questionnaire and the maps were planned to collect data about the farm but what we observe is that at the same time these elements allow the farmer to learn the logic of the other stakeholders like administration or scientific.

The questionnaire gathered information and data that will be needed for the software application. On the other hand it links several elements that usually are treated by the administration in separate ways, for example cultures and herd composition. So it allows the farmer to have a synthetic vision of all the aspects of the farm. Associated to the map, this is also the first opportunity for the farmers to have a spatial vision of their farms: the farm building, the lots, and on the same map, the environmental constraints expressed as perimeters and natural elements. In comparison with the previous wallon program and with some other management plans, the plan observed here give a great importance to maps. Maps represent some aspects that can't be integrated into the software, which need quantitative data or marks.

The map is also an opportunity for the farmer to understand some biodiversity points. This gives him the opportunity to become an active in the diagnostic phase. His role is greater than just a choice between to subscribe or not to a measure. This element refers to what Winter called "to bring farmers back into the analysis" (Winter, 1997). In some cases, the rising of the farmer's knowledge is considerate as a risk by the advisers. Some advisers who care about

biodiversity prefer not to tell the farmer about the presence of patrimonial species in their farm. They are afraid that the farmer would destroy the natural habitat. But in most of the cases, this will improve the farmer's qualitative involvement in the agri-environmental scheme (Delvaux et al., 2002).

Maps as intermediary elements between farmers and scientists

The GIS thematic map represents a new vision for the farmers. During the interviews, some of them are very bothered by this new representation. Usually they are used to connect the different lots by roads and they are sometimes lost in a map representation. Farmers are more and more confronted to the map representation of their territory either by using this type of GIS map or either by the way of aerial photographs. We could assess that GIS maps which show mainly perimeters represent a scientific vision of the territory. Introducing maps to the farmer gives him the opportunity to a better understanding of how the other stakeholders, like naturalists or scientists involved in ecology, perceived their lots. On the contrary, the software do not allow this meeting between farmer and scientist, as all the data are treated outside of the farm.

This map gives also the opportunity to introduce the biodiversity element to the farmer, first by the way of the different ecological perimeters and secondly in mapping the elements which constitute the ecological network. Biodiversity underlined here is presented at several levels. The first level is composed of species and habitats found or expected to be found on the farm. The second level, at the landscape level, is the network composed by all these elements. This is linked to a biodiversity program in Walloon Region (PCDN). Some communes proceeded to the mapping of all these natural elements in order to improve the ecological network to favour biodiversity (Melin, 1995). This management plan is the first attempt to use these thematic maps in an agricultural objective.

Improving measures localization in order to improve biodiversity

The need for map is a scientific requirement for a more acute localization of agri-environmental measures dealing with biodiversity. The question of biodiversity is different from the other actions dealing for example with reduction of pesticides and nutrient emission. The localization of the action is of great importance in order to protect some species or natural habitats. For example, one measure prescribes a late cutting (after 1st of July) associated with low nutrient and no pesticides in order to restore plant biodiversity. Many conservationists assessed that this measure would be applied on marginal lots like wet meadows for example. Our study shows that in contradiction with this hypothesis, many farmers included this measure in their cultural lots and are using the hay coming from these lots (Roussel, 2003). An other study (Rouxhet et al., 2003) shows that more of half of the meadows don't show any biodiversity improvement by the late cutting measure. One of the reasons is found in the bad localization of the implementation of this measure. At the regional scale (Wallonia), according to where this measure is applied, only 60% of plots are presenting a biodiversity interest and would be improved by the application of this measure (Walot & Rouxhet, 2002). In order to improve the program efficiency, there is a need to identify lots with natural richness and to convince these farmers to subscribe to this measure. Localization can be, in a certain way, in contradiction with the large voluntary involvement of the farmers. Some prescriptions have no effects when not applied on the right place. This spatial aspect of the biodiversity, as it is underlined by (Yliskylä-Peuralahti, 2003) about the Finnish case, "has created turbulence in policy-making". This reflects what happen in Wallonia : the need for a evolution of the policy in order to take into account the biodiversity aspect. This strongly differs from pesticide or nutrient thematic for which we can expect that we have most of the

time at least a little effect. Having the right practice on the right place is one of the challenges of improving the biodiversity.

Need for a new conception of evaluation

Another disturbing point coming from the biodiversity aspect is that it is very difficult to assess. In their recent review about effectiveness of agri-environment schemes in conserving and promoting biodiversity, Kleijn and Sutherland (Kleijn & Sutherland, 2003) first show the difficulty and the weakness of an experimental approach on large scale evaluation studies. Not only these studies are difficult to achieve but few of them indicate positive effects on biodiversity of the agri-environmental schemes. They underline that there is an urgent need to make agri-environmental scheme more effective. According to the chosen scale, local or regional, methods, objectives and problems raised are not the same (Duelli, 1997). Different assessment methods have been developed until now : many are action-oriented, as to say, give a high score to farmer achieving an action without to know about its results (Braband et al., 2003). Some are tempted to be results-oriented, assessing each farm results with criteria, see for example (Oppermann, 2003). Above all, all these aspects raise questions about the evaluation : indeed, the assessment of the regional biodiversity improvement has to be made on a different way than aggregation or addition of all the farms scores (Garcia Ciudad et al., 2001). Regional scales are presents in the management plan by the way of perimeters of designed area and specially Natura 2000 perimeters which are just implemented. A management plan may contribute to the farm-level assessment but taking into account the larger scale natural context. These different scales are linked to each other as biodiversity objectives may vary according to each region but also according to the scale of assessment. Hedgerows are a good example of this context importance: their density are not the same in every region, so how to assess the good amount of hedgerow in an area, at what scale (Kantelhardt et al., 2003)?

The option taken in the management plan studied here is to assess for each farm several biodiversity elements: forest edge, pounds, hedgerow, and first to guide their management and secondly to promote when possible and/or needed the creation of new elements. Based on the Swiss experience, the objective here is to assess the surface of nature's elements in order to reach the threshold of 7% of the farm area (of course the value of this threshold could be re-evaluated). This enhances the problem to give to all farms the same objective despite the great difference between them. For example in a study led in Germany (Menge, 2003) to assess the agri-environmental scheme, they choose to assess each farm evolution by the way of observing mean farm environmental criteria values and their variation, independently from larger targets values or norms. It is the role of the test of the management plan to raise such questions of how to assess at the farm level the biodiversity improvement.

Understanding farmers' practices

Another aspect of this management plan is to provide the adviser the possibility to understand farmer's work organization. Most of the information, for example, when, how much and what kind of manure is applied to each lot is known by heart by the farmer. This knowledge refers to an organization between all the lots depending on the distance from the farm buildings, the soil characteristics, sun exposition,.... According to all these elements, some lots are provided in manure for example before the others. Sometimes, the farmer logic can't be foreseen. For example, we were very surprised in hearing that a quite environmentally conscious farmer applied manure on frozen soil. This practice is of course a bad practice at the same time for environment and for the farmer, because most of the manure is leached as the soil can't absorb it. But for this farmer there were no possibilities to come back on these wet lots before

April as the engines can't enter the lots because of the water level. According to his logic, it was better a few manure in winter than no manure before April.

Some measures induce a slight change into the farmer practice but most of them could lead in fact to a bigger transformation of the work organization. This implies a risk for the farmer. As an example, one measure advocates for a soil culture in winter to avoid nutrient leaching. This measure seems very easy to apply; it is also a good practice for the farmer in order to protect the farm soil. It is so easy that many countries do not give any money for such a practice. But it is surprising that in some parts of Wallonia, farmers are undergoing this winter culture but don't ask for money (Dautrebande & Sohier, 2004). To understand why the farmers don't claim for money, we have to go deeper in the understanding of the implementation of the measure. What is asked is to plough in winter in place of the usual practice which is to plough in autumn. So many farmers don't want to change their practices about this aspect. In this case, there is a gap between administration and farmers about how they consider the implementation of the measure. Another aspect to make this measure efficient, is to decrease the manure of the next culture, depending of the kind of winter culture used (leguminous plant or not, for example). This practice can be helped by the realization of soil analyses. But these analyses are not achieved every year, neither everywhere, so this manure diminution can constitute a risk for the farmer.

How the measure is implemented by the farmers is important in order to understand the farmer participation. The management plan allows at the same time to understand how the farmer considers the measure and how it will transform his activity. At the same time, it allows the farmer to understand the different logics of implementation. The consequences of the measures for the farmers are important to foresee. Among these consequences, the respect of the self-decision of the farmer is also important. During our interviews, we met several farmers who are interested about the late cutting measure but abandoned the money because of the no-adaptability of the cutting date. We observe in these cases that the no-interest from the farmer is not due to lack of information or lack of interest for environment matters, so the main option to stimulate the farmer participation in this case is to adapt the measure.

Long-term personal relation between the adviser and the farmer

The importance of the people involved in the farmer's information has to be underlined. Several interviews with farmers and advisers show that the involvement of the farmers often depends on a long-term relation. We called advisers not only people in charge to help farmers to fill forms but rather people who care to help farmer to fit the program, for example to subscribe measures that are good for them to apply. The Walloon program saw a rise in the farmer participation in 1998 and one element of explanation is that at this period advisers were appointed in order to achieve the agri-environmental scheme awareness (Walot, 2002). Different kind of advisers exists, according to the structure they depend upon (which pay them in fact). Some are rather attached to the agriculture administration, other rather to environmental or rural development structure. But all the advisers have some constraints linked to these three stakeholders: to understand farmer's logic and claims, make the regulation to be respected, keep in mind the environmental objectives. Of course depending of each adviser's values or interest, they emphasize one or another aspect (Roussel, 2001).

Among several elements, the adviser explains to the farmer the logic of the measure but can also show him the good results (for example in terms of plants diversity). The farm visit is very important to build this relation. Involvement of the adviser in a larger program (for example protection of the ground water) helps to make the farmer proud of his action (Roussel, 2001). The role of the advisers can also be to participate in the agri-environmental

scheme modifications in bringing information about farmers' constraints and needs (Delvaux et al., 2002).

The role of the management plan is to link the farmer with the other stakeholders. These stakeholders can be physically present, or represented by several tools. So the map for instance, showing the different perimeters also represents the civil society requests. This link provides not only constraints but can also be positive for the farmer, as to say that the environmental friendly actions of the farmer can be known and give a positive image of the farmers to the society.

Agri-environmental regulation evolution

The European regulation in agri-environment undergoes several evolutions as the results of negotiations between the different European countries but also according the international market regulation (WTO). After the CAP implementation, each country can adapt, in a certain degree, its policy (Lowe et al., 2002). All these changes are sources of uncertainty for the farmers, specially for farmers who have subscribed to many measures (Lien et al.) . The national administration can't provide them the long-term vision they would like to have. The contracts of the agri-environmental measures are lasting five years which is at the same a long term for farmers who don't want to loose their freedom of decision but a short term in order to reduce uncertainty.

We observe that many farmers who agree to test the management plan are interested in anticipating these transformations, as well as getting some money to help them to adapt. On the other hand, this contact between the adviser and the farmer will provide ideas to the administration in order to improve the agri-environmental scheme and to adapt it to regulation evolution.

Conclusion

The quest for the biodiversity efficiency raises many questions to the agri-environmental schemes:

- the adequate localization of the measure
- the understanding of the farmers' practices
- the assessment of the environmental efficiency of the measures at different scales
- the long-term relation between the farmers and advisers

The management plan presented here an answer to the need to have new tools to improve agri-environmental regulation and its application. To achieve these goals, this management plan links several tools, maps, shareware, personal advices, links also several stakeholders and several scales.

This plan management gathers all the aspects of the agri-environment framework. It gathers the different stakeholders concerned by these programs: administration, farmers, scientists and a spokesman of a very important function, often forgotten by agri-environment assessment, the adviser. These stakeholders are present not only by persons but are represented by tools: map and software to represent the scientists, regulation and agri-environmental measures to represent administration, data from other management plan can also inform farmers about the other farmers. It is also an opportunity to make a contact between regulations, that are always too general, and practices that are, by definition, very individual. This plan allows to make the coherence between several levels and scales like regulation/individual practices, farm biodiversity/regional biodiversity.

Many approaches to assess the efficiency of the agri-environmental program involved scientists. The modelisation approach, more or less developed, is looking to put together several kinds of data. Models applications allow generalisation by the treatment of a big amount of data but on the other hand this is a little bit in contradiction with the personal and individual aspect of the farm. It is in fact a leading question in every policy to balance between a general prescription and normalisation but individual application. Despite the great preciseness this model was made of, some farmer's answers can't be taken into account. Another data treatment, more qualitative, by the mean of the map, is needed in parallel with the model. We think that this fact is not function of the model quality (which we wouldn't dare to assess) but raised the question of qualitative data that can't be expressed as a mark. This peculiar management plan enhances two elements that were hardly present neither in the agri-environmental scheme, neither in the assessment program: the farmer (and not someone who represent them) and the territory. Reference to the territory is linked to the biodiversity aspect and to the localization of the measure's application, but it's also a link with other programs which deal with agriculture, environment or rural development. Other elements like personal relations or proposals that are made to improve farm management are emphasizing this link. This is very important because what is perceived by the farmers is the lack of coordination and sometimes contradiction between these different policies.

The quest for improving the efficiency of the agri-environmental scheme raises the question of the farmer implication assessment. We can observe that the efficiency of each measure depends not only on the farmer participation, but rather on the farmer adaptation and learning. Maybe other criteria will be needed to express farmers' implication. Unfortunately, this kind of involvement is very difficult to assess. About the agri-environmental policy (AEP) in UK, Morris and Potter (Morris & Potter, 1995) put on other criteria like "skill, commitment and degree of compliance" to establish the AEP' success rather than farmer's enrolment.

This management plan participates to the implementation of agri-environmental scheme in a gradual and participative way. Other experiences show the interest of such an initiative. For example Gafsi (Gafsi, 1999) highlight that farmers are much more ready to participate in action toward protection of water quality through a gradual approach even though they refuse to apply ready-made solutions. This is possible, not only because of the farmers' learning but also because of the others stakeholders (and specially policy makers) learning. The management plan is an intermediary object, intermediary not only because it make a link between most of the stakeholders and scales but also because it represents one stage in the agri-environmental schemes gradual construction.

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