

## **Conditions for sustainable farming systems: Lessons from implementation of the Territorial Farm Contract**

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### **Summary**

The Farming Orientation Law of July 1999, which aims to develop sustainable farming, is the consequence of intense debate concerning the orientations to be given to farming in the context of a new social contract. This Law has set down a precise procedure for its implementation: the *Contrat Territorial d'Exploitation* - or Territorial Farm Contract (TFC). Using the implementation plan of this procedure, this paper aims to analyse the ways in which development of sustainable farming can be supported by the systems approach. Concerning implementation, an analysis has been made of the Territorial Farm Contracts signed in the Midi-Pyrénées region in south-western France, using statistical analysis and qualitative surveys of a sample of farms. The results show that TFC implementation has more or less accommodated the systems principle which was the founding concept of the procedure on a national scale. The TFC is the social product of local action systems, in which professional farming organisations are dominant. These results imply that social and organisational dimensions must not be neglected since they concern stakeholders responsible for the implementation of sustainable farming procedures.

**Key words:** Farming systems, sustainable farming, systems approach.

### **1. Introduction**

Over the past fifteen years, the farming sector in France has experienced intense debate over the orientations to be given to farming in the context of a new social contract (Hervieu, 1993; Landais, 1998; Doussan et al, 2000). These debates were justified by the manifest limitations of the productivist logic which left its mark on the evolution of farming over 30 years of economic boom. These limitations, which are now evident in terms of overexploitation of natural resources, of damage to and desertification of rural areas, have called into question the age-old image of agriculture as “nature’s partner” (Ambroise et al, 1998) and as the primary force managing the land (Groupe INRA-ENSSAA, 1977; Benoît, 1990; Deffontaines, 1994). These debates culminated in new policies, set down in the Farming Orientation Law (FOL) of July 1999, the aim of which was the development of sustainable farming, whilst recognising the multiple functions of agriculture and emphasising its territorial dimension. The Law set up a specific implementation procedure: the *Contrat Territorial d'Exploitation* - or Territorial Farming Contract (TFC), replaced since March 2003 by the Sustainable Farming Contract (SFC), the aims of which are the integration of the economic, social and environmental functions of farming, and the adaptation of farms to the increasingly numerous and demanding expectations of society. The concept of the TFC procedure, planned on a national scale, was guided by systems approach of farms. To what extent is this approach adhered to in the actual implementation of the TFCs? Which lessons can be drawn from this first experience in sustainable farming procedures?

This paper endeavours to answer these questions which are both topical and of utmost importance for state decision-makers and farmers alike, at a time of mid-term evaluation of the TFCs and their transformation into SFCs. Our objective is to analyse how the development of sustainable farming can be based on a systems

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approach. The paper is based on research carried out by the author on the “assessment of territorial farming contracts for farming in the Midi-Pyrénées region in southern France” (Gafsi, 2003). This research analyses a total of 3146 TFCs signed in the Midi-Pyrénées region between 1999 and 2001. A qualitative survey was conducted in 66 farms having signed TFCs.

The paper is organised in the following way: first of all we give some theoretical considerations concerning sustainable agriculture, the TFC concept and its reference to the systems approach. Then we present the empirical study within the research field, the methodology used and the results of our analyses. Lastly, we discuss the results and present our conclusions.

## 2. Theoretical considerations

### 2.1. Sustainable agriculture

The notion of sustainable agriculture is complex. Hansen (1996) presented and discussed several interpretations which stem from two schools of thought: goal-prescribing and system-describing (Thompson, 1992). In any case, the definition of sustainable agriculture cannot neglect the debate which has been underway since the end of the 1980s around the concept of sustainable development. This concept was used for the first time in 1980, by the International Union for Conservation of Nature and its resources, and presented clear connections with the concept of “eco-development”<sup>1</sup> (Sachs, 1980). But it was popularised by the Brundtland report in 1987 and the Rio summit in 1992 (Agenda 21). Therefore, the definition of this concept, often given and quoted, is that proposed in the Brundtland report: “sustainable development meets present needs without compromising the capacity of future generations to meet their own needs”. Although this definition focuses on the persistence of economic development<sup>2</sup> (Godard, 1992), it does however introduce a few new dimensions regarding development challenges particularly with regard to the conservation of the environment and to inter and intra-generational equity. In the farming sector, these new dimensions take form in the environmental and social functions assigned to farming due to its multifunctional role (Landais, 1999; Aumand et al, 1999). These functions are said to be “new”, but in fact they are far from new. Since time immemorial, farming has fashioned the elements of the ecosystem (Deffontaines, 1994; Deffontaines et Thinon, 2001) and has played an important social role for the rural population. Having said this, the sustainability of agriculture is closely associated with the dynamics of ecological and socio-economic change. Sustainable agriculture can be viewed as a “maintenance of the adaptive capacity of farming systems” (Park & Seaton, 1996), thus allowing us to preserve our ability to farm and produce food into the future, without reducing the options available for following generations. But defining sustainability in terms of preservation or duration has little practical value because of the unfeasibility of long-term experiments (Conway, 1994). On the operational level, Landais (1998) has proposed to examine farm sustainability from four angles:

- long-term farm economic viability as a measure of its economic performance,
- well-being or the quality of life enjoyed by the farmer and his family, as a result of work planning and involvement in the local social fabric,
- farm transmissibility
- environmental regeneration.

These four angles are addressed in the Farming Orientation Laws. In fact, in the very first clause, the FOL state that “farming policy covers the economic, environmental and social functions of farming, and this policy contributes to land management with a view to sustainable development”. The following definition of sustainable agriculture can be put forward: a farming system commanded by planned long-term strategic decisions, which aims for economic performance and farm reproducibility whilst conserving natural resources.

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<sup>1</sup> Formulated after the United Nations Conference in Stockholm (1972)

<sup>2</sup> Other definitions focus on ecological sustainability (preservation over time of a constant reserve of natural resources) or on intra-generational viability (minimum conditions for survival and development in southern hemisphere).

It is important to emphasise two main characteristics of sustainable agriculture. Firstly, with the inclusion of environmental and social functions, sustainable agriculture opens up the field of farming activity beyond its primary economic aim. Also, since these “new” functions are not market-oriented, sustainable agriculture, in producing public goods, requires a new analytical framework which goes beyond the marketplace logic and calls for a holistic approach addressing all these functions (Gafsi, 2001). In addition, sustainable agriculture has a major territorial dimension, so that the term “re-territorialisation” of agriculture has been coined. The environmental and social functions are directly linked with the spatial dimension of agriculture and its social involvement in the use of the land; in other words, an intrinsic link exists between agriculture and the land. This territorial characteristic is widely recognised. The FOL even includes it in the title of the contract that the farmer enters into with the State (Society): the Territorial Farm Contract, which is the keystone of the farming orientation law.

From a theoretical point of view, these main two characteristics of the sustainable agriculture (i.e : the holistic approach of the agricultural activity and the territorial dimension) are based on inspire the systems approach as theoretical framework.

## 2.2. *Systems perspective*

A lot of research works on sustainable agriculture issue refer to the systems approach as relevant analytic framework (Isson et al, 1997; Landais, 1998; Gafsi, 2003). Actually, holistic, objective-oriented and participatory principles represent an interesting analytical tool for analysing sustainable agricultural process.

### ***a/ Holistic approach***

One of the fundamental principles of the systems approach is the holistic principle which addresses the multi-dimensional whole, before analysing the different parts (Le Moigne, 1990). Using this principle, the sustainable agriculture approaches are based on a contract arrangement committing the entire farm and not just some of the land area or activities. Then, the farmer agrees to develop multi-functional farming activities, which contribute not only to farm production, but also protect and manage natural resources, whilst giving stability to land areas. This holistic approach constitutes, also, a relevant framework for multifunctionality of agriculture.

### ***b/ Objective-oriented project***

The concept of project refers back to the teleological precept of the complex system (Le Moigne, 1990). This is important as much as it allows the final objectives of the farm to be defined (Brossier et al, 1997) with a view to introducing real change in farm practices and pointing the farm in the direction of sustainable agriculture. The project logic is one of the essential foundations of the sustainable agriculture approaches. It was explicitly mentioned in the recommendations made by the *Conseil Supérieur d’Orientation* (CSO, 1999). In real terms, each farmer seeking to sign a TFC has to agree to work out an overall farm plan. This plan is based on an overall diagnostic assessment of the farm (Marshall et al, 1994) allowing identification of its strong points and constraints, as well as strengths needing consolidation and weaknesses needing improvement. The plan culminates in the elaboration of a farm project in which the main aspects of changes in the farming system must be apparent. To what extent has the project logic been respected in the implementation of TFCs? Farmers can be concerned only by economic incentives of the TFC, while keeping their farming system unchanged. Or, also, the elaboration process of farmer’s project can be irrelevant. This question is approached by the notion of “ internal coherence ” of the contract (in the occurrence the TFC). The internal coherence allows to measure the degree of coherence between on the one hand the real project of the farmer and on the other hand commitments subscribed in the contract.

### ***c/ Territorial dimension and participatory approach***

The project logic requires internal coherence between the farmer’s individual project and the tasks agreed to in the contract. It also requires external coherence, in conforming to the collective objectives set to meet the local territorial challenges. The external coherence, which bases the collective dimension of sustainable agricultural

approaches, is fulfilled through the territorial dynamics leading to creation of a collective project. This collective dimension is revealed on the territorial level, the only level able to rise above the farm-sector logic which revolves around farm production alone. Thus a transversal logic is born, involving all the stakeholders in the rural area in a participatory approach, both farmers and non-farmers. The territorial dimension refers back, from a theoretical point of view, to the systems principles of partnership and participation (Beuret, 1998 ; Brossier and Gafsi, 2000 ; Gafsi, 2001) allowing complex problems such as sustainable development to be understood and organised (Simon, 1978). The partnership principle is based on cooperation within a shared network of horizontal relationships and particularly focuses on the shared responsibility of all the stakeholders involved. Through vertical social relationships, the participatory principle involves all the affected individuals in all decision-making relative to their future.

The above commentary show the systems perspective of the sustainable agricultural approaches. We have to examine now, using the TCF case study – a French sustainable agricultural approach - to what extent does local implementation faithfully follow these systems principles.

### 3. Case study and methodology

#### 3.1. Case study

The TFC contract represents the French approach of sustainable agricultural development. It was established by the FOL of 1999. It is based on a contract arrangement committing the entire farm, for a five years. “ It must be based on a project involving the entire farm. Through this project the farmer agrees to develop multi-functional farming activities, which contribute not only to farm production and creation of added value, but also protect and manage natural resources, landscapes and biological biodiversity, whilst giving stability to land areas and employment ” (Ministère de l’Agriculture, 1999).. Every, TFC contract must comprise two aspects: socio-economic aspect, and environmental and territorial aspects (see Box 1). The TFC, which is based on recognition of the fact that agriculture is multifunctional (Aumand et al, 1999; Gafsi, 2002), not only addresses the economic function, i.e. production and marketing of quality goods, but also the “new” environmental and social functions.

#### Box 1

The TFC is a contract between the State, represented by the Departmental Prefect, and the farmer for a period of five years, by which the farmer undertakes to carry out the tasks stipulated in the contract, in return for financial support. It covers the following two domains:

Socio-economic domain		Environmental and territorial domain	
Challenges	Objectives	Challenges	Objectives
Employment	Maintain and create employment Facilitate installation of young farmers Help in farm transmission	Water	Preserve and improve water quality Improve water resource management
Work	Adapt expertise and qualifications Improve work conditions and organisation	Soils	Control erosion Preserve physical / chemical/ biological fertility
Product quality	Improve product quality Increase food safety	Air	Preserve and improve air quality
Animal well-being	Improve animal well-being	Biodiversity	Preserve natural species and biotopes
Economics - autonomy	Consolidate farmers’ economic organisation Diversify farm and non-farm activities Improve marketing channels for farm products Increase added value whilst lowering production costs and optimising natural resources.	Landscape and cultural heritage	Preserve and enhance heritage buildings Preserve, enhance and improve landscape quality
		Natural risks	Control erosion, flooding, fires, avalanches
		Energy	Reduce energy consumption Develop the use of renewable energy resources

From Ministry of Agriculture (1999)

The Midi-Pyrénées region in southern France, with 2,362,000 ha of usable agricultural area (UAA), is the first region in France to implement the TFCs. The first contracts were signed in autumn 1999. In December 2001, 3216 farms had signed a TFC which represents 9% of all professional farms<sup>3</sup> in the region according to statistics compiled by the Agricultural National Census in 2000. In order to prepare the mid-term evaluation of the TFC procedure due in 2003, the regional TFC evaluation and monitoring committee asked us in 2002 to carry out a methodological study on the first TFCs signed. In addition to the methodological aspect and among other objectives, this study aimed to analyse the internal and external coherence of the TFCs. Internal coherence refers to the farmer's project, and external coherence refers to correlation with territorial challenges and objectives. Analysis of these two types of TFC coherence will allow us to demonstrate to what extent TFC implementation has respected the systems principles which were the foundations of the procedure.

### 3.2. Methodology

Two levels of analysis were called for in order to examine the two types of coherence, analysis of the farm for internal coherence and analysis of the rural area for external coherence. We carried out surveys in 66 farms, in two different rural areas, and 14 interviews with stakeholders present in these two areas (advisers, technical officers, coordinators...). The choice of farms surveyed was determined by two factors: representativeness of farms having signed the TFCs in the region, and respect of the territorial dimension, allowing a thorough analysis of the coherence of signed TFCs with the territorial challenges.

With regard to the first factor, we carried out a preliminary typology of the 3146 farms having signed TFCs, using data analysis software (Modalisa). A corresponding factor analysis (CFA) allowed us to distinguish five types of farm, in which the UAA variable and choice of production system variable played a crucial role. Thereafter, from each type, we surveyed the number of farms proportional with its number of employees (about 2%). Regarding the second factor, whilst respecting the first factor of representativeness, we opted to select farms situated in two areas: *Bas Armagnac* in the *Gers* department, and *Cause Central* in the *Lot* department. The choice of these two areas, made by a committee of experts, was motivated above all by the fact that they are faced with all the agro-environmental challenges in the region. We made the hypothesis that territorial characteristics are formed mainly by agro-environmental challenges.

In order to analyse internal coherence, for each farm surveyed we first identified the farmer's project, through analysis of the evolutionary path taken by his farm, his production means, his current activities and his perspectives for change. Thereafter, we analysed TFC commitments and the measure of coherence between these commitments and the farmer's project. Regarding external coherence, we began by identifying for each of the two rural areas and using interviews with local stakeholders, three socio-economic challenges and three environmental challenges. Then we attributed for each farm a value for each challenge, which reflected the extent to which this challenge was addressed in the farmer's TFC commitments. Obviously, this value incorporated the specificities of the production systems and the progress margins for each farm. On the other hand, the values did not really incorporate existing practices, especially in the environmental domain. Emphasis is given to perceived effort and change introduced by signing the TFC. Four values were possible: 0 = TFC commitment but no connection with the challenge (not addressed); 1 = low connection; 3 = moderate connection; 6 = high connection. The final value for each farm, allowing assessment of external coherence or the connection between TFC and local challenges, is the average calculated from the six challenge values. If the value is under 2, the TFC has little connection with local challenges (low external coherence); if the value is between 2 and 4 the TFC has a moderate connection; and if it is higher than 4 the TFC is considered to have a high connection.

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<sup>3</sup> According to the definition given by the statistics department of the Ministry of Agriculture (SCEES), a professional farm must cover an economic dimension of at least 12 wheat-equivalent ha, and employ the equivalent of at least 3/4 of a full-time worker.

## 4. Results

### 4.1. TFC coherence with the farmer's project

The farmer's project is taken here to mean the final objectives and strategic choices which are behind farm development and operation. It is different from the "plan of action", for example investment plan or restructuring plan, etc. Data analysis allowed farmer projects to be classified into three categories:

- *Development – investment*: these are projects oriented towards significant changes in farms, either in connection with the development of new strategies or strengthening of current strategy. This type of project is observed in the majority of farms (i.e. 65% of farms).
- *System continuity*: current strategies are preserved, either because the current farming system is satisfactory (good techno-economic performance), or a major idea for improvement is lacking for various reasons (farmer's advanced age, limited equipment capacity, very limited progress margin, etc.). System continuity is observed in 20 farms, representing 30% of the sample.
- *Heritage*: these are heritage conservation projects, observed in 3 farms<sup>4</sup>. These are projects governed by a heritage logic and not a production logic.

Analysis of TFC coherence with the farmer's project allowed us to distinguish three types of connection:

- The TFC initiated the farmer's project, i.e. the TFC was the force behind project implementation. Thanks largely to financial incentives, the TFC encouraged the farmer to envisage new development ideas. Without the TFC, the project would not have been implemented. This type of connection is fairly infrequent and was observed in 4 farms out of the 66 farms surveyed.
- The TFC backs up the farmer's project: the TFC, through financial support and institutional framework, backs up an existing project. The TFC is coherent with the farmer's project. This second type of connection is the most frequent and was observed in 61% of farms (Figure 1).
- A weak connection between the signed TFC and the farmer's project: the commitments made through the TFC, for various reasons dependent or independent of the farmer's choices, have no direct connection with the farmer's project. The TFC can however produce improved opportunities and revenue support. Farms with a weak connection between the TFC and the farmer's project represent a third of the sample.

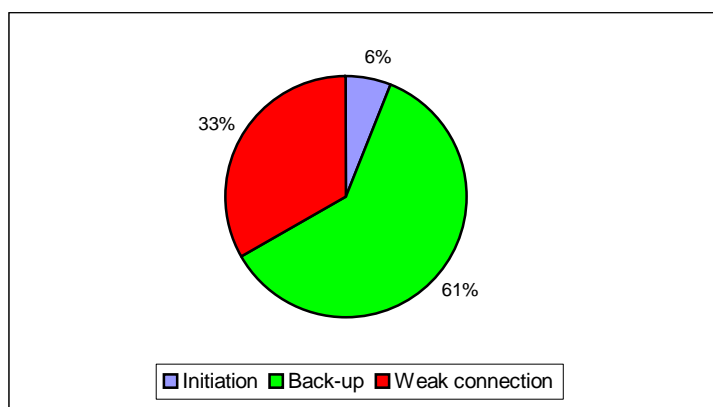


Figure 1: connection between the TFC and the farmer's project

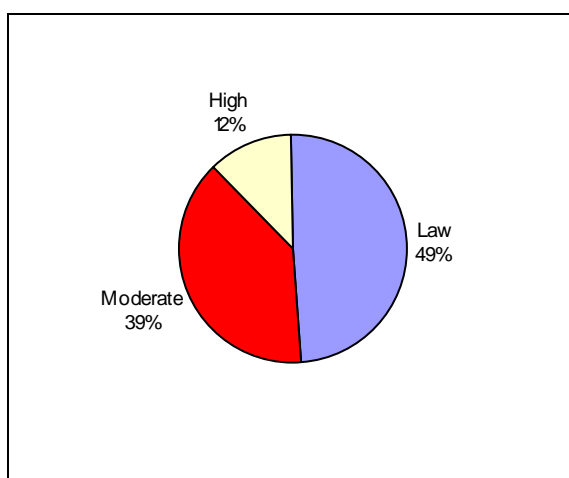
How can these connections be explained? Which factors influence TFC internal coherence? Several factors have been studied: the farmer's actual project and his motivations for signing the TFC, the effect of certain farm structural variables (farm choices, farmer's age, net revenue), conditions of TFC implementation (information channels, conditions for formulating request, length of procedure, etc.). Multidimensional analysis (CFA) shows the importance of two factors in the internal coherence of the TFCs studied. The first factor is the stage reached in the life-cycle of the farm, particularly in connection with the farmer's age. TFCs signed with younger farmers, usually in the development stage, are more likely to be coherent with the farmers' projects. The second factor is

<sup>4</sup> 2 pluriactivity farms and 1 developing a tourism activity not really connected with the farm.

production system choices in connection with the challenges set by the recent change in the economic contexts of the wine sector (in Bas Armagnac) and sheep meat (in Causse Central). TFCs signed for diversified mixed farming systems are more coherent than those signed for systems specialised in sheep meat.

#### 4.2. TFC coherence with territorial challenges

Do the signed TFCs meet the challenges of rural areas? Results show that half of the farms have few connections with the challenges posed in rural areas (Figure 2). Most of these farms are grazing farms in Causse Central. Once again our emphasis is on the real effort and changes introduced by signing the TFC. Only 12% of farms have a high connection with territorial challenges. These results may come as a surprise. The vast majority of signed TFCs reveal a moderate or even low territorial dimension. How can these results be explained?



**Figure 2: connection between the TFC and territorial challenges**

Multidimensional analysis underlines the role of farmer projects and their opinions of TFC, production system choices, the nature of commitments made within the TFC, conditions for implementing the procedure which differ from one area to another. Typological statistical work furnishes four distinct groups of farmers: the first two groups display a low TFC – territorial challenge connection. The third group displays a moderate connection; and the fourth group displays a moderate to high connection.

*Group 1:* farmers who see in the TFC a tool for obtaining aid without much modification. There are 20 farmers in this group, of which 16 present a weak TFC – territorial challenge connection. This group is composed of farms specialised in sheep meat, using a quality approach (Red Label) and situated in Causse Central. Farmers in this group operate within stabilised systems, and their project is to maintain the system whilst trying to obtain aid for agro-environmental action coherent with their extensive system. This strategy has resulted in few actual investments and TFC requests centred on aid to farmland areas (amount of investment / TFC total amount < 20%).

*Group 2:* composed of young farmers who consider the TFC to be an economic tool to be used in farm development. 15 farms make up this group with diverse farming choices, particularly off-soil production. The farmers are in the phase of development – investment. TFC signing was motivated by equipment modernisation. The TFC backs up the investment programme: over 25,000 €, with TFC aid over 9000 €. In view of farmer motivation and farm choices, environmental commitments were limited.

*Group 3:* wine-growers in Bas Armagnac. This group is composed of 17 farms presenting a moderate TFC – territorial challenge connection. TFC signing supports the effort made by these farms to solve the wine production crisis, by adopting quality practices, and committing to major practice modification, particularly in planned control. The number of agro-environmental projects is between 3 and 4 projects per farm.

*Group 4*: this group is composed of diversified farms where the TFC respond the most to territorial challenges. Composed of 14 farms practising mixed farming in livestock and wine-growing, situated in Bas Armagnac. Farmers in this group have signed agreements for major environmental commitments (5 or more projects) and have carried out economic changes in terms of quality approaches and equipment modernisation.

## 5. Discussion and conclusion

The results of the empirical analysis show that TFC implementation has more or less incorporated the systems principles on which the concept is based. In the TFCs we analysed, when the project's logic was not closely followed, the territorial dimension was not taken into consideration. With regard to internal coherence, we mentioned the factors explaining the stage reached in the farm's life cycle (Chia, 1987) and production system choices. Other factors, such as implementation conditions, have an undeniable effect on TFC coherence. Improvements are possible, especially regarding diagnostic assessment quality which precedes planning of the tasks set down in the agreement, and above all meticulous definition of tasks set down in the agreement, which must respect the conclusions of the diagnostic assessment. Diagnostic assessment quality is most important, as pointed out by Josien et al. (2000) in their study of typical approaches to carrying out diagnostic assessment in 14 departments in France.

With regard to external coherence or the territorial dimension, this clearly has a limiting effect on the procedure and lessens efficiency. This was revealed by the analysis of expected effects of TFC signing on environmental protection, which are low, or even very low, (Gafsi, 2003). Stakeholders involved in setting up the TFC procedure have already pointed out this limitation, which is the result of stakeholder interaction in which professional farming organisations are largely dominant. This dominance has led to an institutional TFC model (Léger, 2000) proposed by professional farming organisations and in which territorial challenges are reduced to fundamental farming projects. In this model, the "new" functions of farming are perceived as the effects produced by the production function, which remains all-important. From this angle, the TFC is nothing more than a technical modernisation tool or an "adaptation agreement" to new market rules and future environmental regulations (Léger, 2000). This model is of course consistent with a vertical product sector approach, marked by the productivist logic. It is contradictory with the aims of the TFC, i.e. orientation towards sustainable agriculture which requires a transversal and encompassing approach (Park & Seaton, 1996; Gafsi, 2001) involving all the stakeholders in the area.

The limitations that have been highlighted here, in that the project logic and the territorial dimension have not been addressed, are not restricted to our study area, the Midi-Pyrénées region. They have been acknowledged for all TFCs in the audit requested by the Ministry of Agriculture (Eliez et al., 2002). The new procedure, the Sustainable Farming Contract, is supposed to overcome these limits by investigating and simplifying the territorial framework: definition of each area, standard agreement covering a very limited number of measures addressing the essential challenges in the area. But do these results justify the conclusion that the systems approach is insufficiently operational and cannot support effectively the steps being made by farms towards sustainable agriculture? In any case, the lessons that can be learned from TFC implementation, as a procedure at the service of sustainable agriculture, are that the effectiveness of such a procedure does not just rely on the goodwill of the creators of an overall structure based on systems principles, on the national level, but also on the dynamics of stakeholder interaction on the operational levels (implementation and monitoring). The TFC, when actually implemented, is nothing more than the social product of a local action system, for which the mechanics need to be understood and its functioning needs to be coordinated. The development of sustainable agriculture is the result of an approach which seeks to reveal the different, and sometimes conflicting perspectives of stakeholders. In this case, we are truly at the heart of the systems approach (Ison et al., 1997; van de Fliert & Braun, 2002).



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