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The Multi-Functionality of Agriculture and Territorial Governance – A Learning Process in an Island Environment (Réunion)

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1. Introduction

Nowadays, territorial development is considered to be a complex process of a socio-technical and organisational nature. Therefore, it is appropriate to involve a significant number of stakeholders in decision-making and action development. Governance of this kind constitutes a new mode of coordination between stakeholders with different interests and different logical devices. It requires innovative apparatus and learning tools. However, the process of governance alone also provides a new source of learning. In this paper, we would like to contribute to the debates on territorial governance, by analysing a concrete example of agricultural development.

The relationships between a learning process and governance are complex and tensions occur frequently. Social sciences have developed research on implementing methods to coordinate stakeholders and regulatory systems. However, there has been little focus on territorial governance as a co-production process (between public and private stakeholders) for actions, objectives and rules within a territory. For some years now, 'governance' has, however, symbolised a new approach to managing relationships between the state authorities (which have been elected) and the population. The first impression we drew from our observations of the agricultural and rural world was that these new processes, which attempt to reconcile rules with local needs and politics with popular thinking, are the result of hybridisation and 'trial and error' (Chia *et al.* 2008). Nonetheless, they are very informative for researchers interested in rural development and an organisational approach. In this chapter, our aim is to contribute to the discussion in order to define and outline 'governance' at the same time as highlighting the analysis of the relationships that exist between the learning process and governance. The

term "governance" was first applied to companies to illustrate the relationships between shareholders and employees. It was then used to characterise the new relationships that the state developed with the private sector via decentralised services. The aim is to set up the policies implemented at a national level or to develop new policies at a local level.

The problems related to governance and, in particular, to its territorial dimension have been identified recently by Simoulin (2007). He defined governance as "*all of the cooperation situations which can no longer be organised based on hierarchy and the situations in which the state has no way of obtaining information in a satisfactory manner*" (Simoulin, 2007, p.17). Governance, therefore, represents a possible solution for developing a new society-based project, in which participation can be included in the democratic representation on the basis of an updated social contract. Governance is similar to organisational innovation, which is considered as a process. It is the product of alliances, hybridisation and the adaptation of many technical objects, as well as that of stakeholders and situations.

Our analysis mainly focuses on the tools and institutional arrangements that stakeholders use and/or produce in new situations in order to ensure territorial management with particular emphasis on the learning processes. Management tools express information (in different formats: logbooks, criteria, etc.) enabling stakeholders to justify their decisions. An instrument has a wider application and refers to a combination of criteria, tables, etc. in addition to cognitive models. Management tools are instruments that can be used in the rationalising process. The objective consists of "*helping an actor or a group of actors to analyse the context in which their actions take place and to anticipate possible developments*" (Moisdon, 1997, p.25). 'Institutional arrangement' is an even more general expression and stands for a combination of tools, instruments, representations, rules and people, etc.

In the French agricultural and rural sector, the 1999 Agricultural Orientation Law (AOL) was a manifestation of the collective recognition of the multi-functionality of agricultural activities (Appendix 1). The AOL set out propositions as well as obligations for both farmers and other rural development stakeholders in relation to issues that were previously not

The AOL of 1999 introduced two major changes with regard to previous laws:

1. Remuneration of the functions that the market did not take into consideration.
   The AOL encourages farmers to develop a global project that integrates the functions of agriculture (economic, social and environmental) and contributes to sustainable territorial development. The "economic function" used in the AOL means that food production is one of the functional components of multi-functionality. The SAC is the main tool used (Appendix 2).
2. Mainstreaming of non-farming stakeholders.
   The AOL extends the membership of the agricultural departmental commission (CDOA, Commission Départementale d'Orientation Agricole), which determines the priorities of production management and farm development policy. Previously, the CDOA was composed of exclusively agricultural stakeholders. However, it now includes non-agricultural territorial stakeholders from civil society: consumer and environmental protection groups, craftsmen, fishermen and hunters. It has to give its opinion on the draft model SACs, the "standard contract", that are likely to be proposed for farm holdings.

Appendix 1. The July 1999 French Agricultural Orientation Law (AOL)

considered important, for example: landscape and natural resource management, territoriality of activities, establishment of a coordination committee with other land users. The state authorities set up a management apparatus to promote participation, which can facilitate the governance of rural development and local areas: the agricultural departmental commission (CDOA, Commission Départementale d'Orientation Agricole, Appendix 1). The creation of the CDOA and its subsequent extension to non-agricultural stakeholder categories actually marks a change in the method of state intervention in the agricultural sector. We go from a situation where the state, via the state organisations linked to the Ministry of Agriculture, Research, Economics, etc. defined and applied the actions that it considered desirable to a method of governance in which local stakeholders are involved in defining and implementing actions. Jean & Bisson (2008) describe this as "new partnership governance". The implementation of the AOL via a new contract, the Sustainable Agricultural Contract (SAC, Appendix 2), has encouraged and accelerated active encounters

The SAC was first called a Territorial Farm Contract (TFC). It was designed to support farmers who developed a comprehensive project using new production methods to satisfy non-commercial functions (*i.e.* not remunerated by the market) but required by society: natural resource management, adapted fertilisation, quality foodstuffs, traditional production, etc. "*it helps to improve the conditions of production, incomes and living standards of farmers*" (AOL, art. 1).

1. The SAC is a 5-year contract drawn up between the state and the farmer
   The farmer draws up the SAC with an SAC project holder, either a rural institution or organisation. The project holder has to present the SAC proposal to the agricultural department committee (CDOA, Appendix 1). When approved, it has to be accepted by the state administration. The signatory farmer is legally bound by the contract for 5 years. An overall project is drawn up as a function of the factors at stake. The farmer receives financial assistance in return for complying with the SAC's conditions.
2. The SAC improves interaction between:
   - sector-based agriculture and local development: management of specific territorial characteristics;
   - environmental, social and economic functions of agriculture: overall farm project. The SAC concerns the overall coherence of the farm and fits into the local development strategy. It should be drawn up in accordance with local guidelines (Appendix 1), the "standard contract". The latter "*is composed of a coherent set of standard measures and actions (Agro-Environmental Measures – AES), designed within the context of a project, to meet the stakes identified in the study prior to the establishment of the territorial farm contract*" (AOL, art. 1).
3. Thus, the 5-year SAC includes two sections:
   - the Environmental and Territorial Measures (ETA), including, for instance, actions on biodiversity management, cultural heritage and landscape maintenance, water management, integrated fertiliser and pesticide use. An SAC includes several ETAs, with a maximum payment per hectare and per year;
   - the Economic and Employment Commitments: for instance, investment, diversification, improved working conditions, adding value to production or rural tourism.

Appendix 2. The Sustainable Agricultural Contract (SAC); economic measures and environmental and land-related measures.

between various stakeholders: farmers, state extension officers and professional technicians, researchers and even agricultural employees, economic organisations (cooperatives, banks), consumer representatives or environmentalists. The CDOA coordinates the actions involved in "establishing" the SAC, including measures of evaluation and control, as well as actual content. The aim is to provide a focal point for territorial governance and for managing controversies in relation to implicit technical knowledge.

The implementation of sustainable agricultural contracts (SAC) in Réunion is particularly interesting because the new tools do not apply the former rules. Instead, they propose a new reference system and new approaches for agricultural and rural stakeholders. Agriculture's multiple functions reflect its territorial integration (Piraux et al., 2006) and presuppose the development of new relationships between local stakeholders. We propose an examination of the management mechanisms and the tools that stakeholders use and/or develop in new situations like this so that they can strengthen the management apparatus for their territories or define what they will become. The first part of this chapter clarifies the learning process. We then go on to describe our methodology and the main results we obtained. The relationships that exist between the learning process and governance are then analysed. In conclusion, we underline the importance of continuing the analysis of the function of this type of apparatus, not only to enlighten public decision makers but also to further knowledge on the apparatus for territorial governance and its management.

2. Management apparatus and organisational learning

Early research and also more recent research on organisations have highlighted the role played by tools, instruments and management apparatus in terms of their function and the coordination of action between stakeholders. Several authors have also underlined the importance of these tools, instruments and management apparatus for public or private organisations (Hatchuel et al, 2005; Lascoumes & Le Galès, 2005). The instruments used by this type of management can be: (i) material, such as a computer, for example; (ii) conceptual, such as the discount rate; (iii) aids for complex decision making, such as a marketing model for studying the potential market for a new product. These instruments can be analysed as a response to the complexity of any management apparatus.

The word *'dispositif'* (Foucault, 1994) has no single direct English equivalent. It can refer to a socio-technical system (Lianos, 2003; Dulcire & Chia, 2004) or to apparatus, *i.e.* a device or a mechanism oriented to produce something. Foucault defined it from a long enumeration that he grouped into a network, "*a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions–in short, the said as much as the unsaid. Such are the elements of the apparatus. The apparatus itself is the system of relations that can be established between these elements.*" (Foucault, 1994, p. 195). Agamben (2009) adopts this characterisation as a "decisive technical term" and complements it by adding "*the capacity to capture, orient, determine, intercept, model, control, or secure the gestures, behaviors, opinions, or discourses of living beings*" (Agamben, 2009, p.14). Thus the concept of apparatus allows us to understand a system as a configuration of shifting social and collective arrangements rather than a simple configuration of unmoving technical layouts. The strategic function of the apparatus corresponds to the governance that Foucault called the "governmentability".

In the field of agriculture and the environment, Mormont (1996) analysed the plan of action Agenda 21's[1] by looking at the apparatus that the stakeholders had set up to manage actions. He defines the apparatus as institutional agreements that link representations, standards, practices and stakeholders. This effectively implies taking into account the stakeholder learning processes and the corresponding adjustments made to the apparatus itself as a result of this learning. The apparatus is not a fixed object. It can be constructed, deconstructed and (re)defined continually.

Research on the learning process within an organisation has developed continuously since Argyris (1993) expounded his representation of the organisational learning process. He modified the pending theory of action within the organisation. Therefore, reference will be made to his work. His main objective was to construct an action-based theory (or research-action) in organisations with the aim of transforming them and supporting the change. The main hypothesis presumes that in order for this transformation to occur, members of the organisation have to modify their behaviour. Therefore, they have to learn and thus grasp new knowledge, techniques and mechanisms.

The learning process can be used for facilitating or preventing change: for example, the well-known defensive routines manifested by members of the organisation when they have not helped define the objectives or when changes generate doubts and modifications in their reference system. For example, when proposed changes do not comply with the representation that actors have of their objectives and contribution (place and role in) to changes, they can hinder the processes by simple reactions, such as failing to hand files in on time, failing to sign them, etc. Argyris & Schön (1978) have shown that there are two types of learning processes within organisations. The first is a simple loop process that occurs when members develop an operational learning process enabling them to modify their strategic plan of action. Whereas, the double loop learning process can be used for modifying strategies as well as underlying 'values' (objectives, paradigm). They modify the current theory of action in terms of the organisation.

Le Bas (1993) has identified two dimensions in the learning process: an individual dimension and a collective dimension. He considers that "learning is a process employed for acquiring knowledge". It can generally be defined as a process of accumulation and memorisation. It concerns human beings in their social activities above all and, particularly, in their economic activity. Although the learning process is obviously supported by an individual agent, it is also determined by the organisation within the institutional arrangements developed by the economic and social reports prepared by individuals. Thus, the expression "learning companies" seems inappropriate. Each member of an organisation constructs his own representation or image of the process. We actually believe that learning is essentially an individual process. Only individuals learn and not the organisation itself. They learn within an organisation, by addressing organisational issues. Moreover, one of the founding principles of the systemic approach allows us to state that the sum of learning is not organisational learning.

[1] Agenda 21 is a set of concrete recommendations drawn up by the United Nations for the 21st century and signed by 179 nations. These recommendations are derived from the concept of sustainable development and based on three main pillars: economic action, social development and careful natural resource management.

An organisational learning process is, therefore, defined as a process that enables the organisation's stakeholders to acquire new knowledge, which is necessary for their contribution to productive, relational and organisational activities. This concerns new knowledge and know-how. In spite of the fact that in common language, knowledge and know-how are used indistinctly, major differences do exist and require clarification. Knowledge can be used for an individual, whereas know-how concerns a group, *i.e.* its construction and legitimacy are defined by a group of actors: "*...knowledge is therefore developed through experience*" (Avenier & Schmitt, 2007, p.122). The state of knowledge at a certain point forms one body with the individual. Know-how is defined as a series of statements, which express representations of the knowledge-state, which is internal to the subjects.

When Theys (2003) tried to define the notion of governance, he questioned the governability within the meaning of what is governable. "*If the notion of governance concerns rather the tools and processes of collective action*", that of "*governability focuses on specific situations*" (Theys, 2003). Governability supposes that, when confronted with specific and complex situations, effective and acceptable solutions have to be found. Some situations are intrinsically or politically manageable, others are not - or only with difficulty and effort. The meaning of governance may be too similar to that of organisational innovation (Cohendet et al., 2003), considered as a process. It results from alliances, hybridisation, "botching together" (Duymedjian & Rüling, 2010), in relation to technical objects, stakeholders and situations.

Therefore, we define territorial governance as the process of coproducing actions and rules within a territory between public and private stakeholders, with diverse and sometimes contradictory objectives, which help them to initiate processes that would define or outline a territory. In turn, these processes require learning processes. The process of territorial governance is actually the result of the continual interaction between the forces that generate conflict and those that encourage cooperation, the forces generated by tensions and negotiations in various forms (controversies, arguments, discussions, working groups, etc.).

Using these patterns and our local knowledge, we organised the work around three research proposals that were developed using surveys and observations.

- Organisations must use "learning processes" in order to modify their practices and favour technical and organisational innovations.
- The agents' learning capacity determines the stakeholders' and organisations' capacity to "change". Hatchuel (1994, p.112) states that the "*collective learning process is not only a coordination regime between actors but it is also a training process for actors*". As a result, we have to learn to create mutual trust collectively: a joint project.
- The learning process constitutes a major component for governance. Learning is a necessary process for the stakeholders at a local level. It enables them to develop and/or use new methods for coordination and decision-making within organisations by reducing transaction costs and opportunistic individual behaviour. We have defined it as governance.

3. A participative and comprehensive approach for studying the learning process

During the research project on the implementation of the French AOL (Agricultural Orientation Law) in Réunion (Appendix 3), we first conducted semi-structured interviews

with farmers, civil servants from the Ministry of Agriculture and employees from professional organisations. We analyse: the local stakeholders' representations of the former agricultural activity and its management and the new activities promoted by the law; the design process and preparation of technical and economic references; the changes in the social, technical and organisational practices adopted by the contract farmers; in addition to the changes in the practices of the extension and administrative services; and the impact that the process has on representations and new development. The aim was to identify their perceptions (explicit or implicit) of the current agricultural situation on the island and their visions of agriculture in the future, including how they managed the new social contract and how to make the most of it. The surveys were conducted according to the guide based on changes in practices and learning processes. We also used data from former studies on the implementation of SAC in 2002 and 2003, as well as data from the analysis on the development of agricultural practices in 2003 (Piraux et al., 2006). Thus, we were able to identify that the learning process is a key issue for optimising the organisation of the system and relationships between stakeholders.

Réunion is an island that covers an area of 2 512 km^2. It is entirely made up of basalt from lava flows that extend to 4 000 metres below sea level. It is a French Overseas Department located in the Mascarene Archipelago in the Indian Ocean. Two principal territorial units are commonly distinguished: the lowlands and the highlands. Most sugarcane is grown in the lowlands, which are between 0 and 400 m above sea level. The highlands constitute the areas above 400 m. In 2006, the population was 782 000 inhabitants with an annual growth of 1.6%.
Although most of the land is used for agriculture, including forest exploitation, agriculture is not the island's main economic activity. In 2006, the tertiary sector represented more than 82% of the added value; the secondary sector represented 13% and agriculture only 5%. Sugarcane is cultivated in the lowlands and is particularly affected by urbanisation. Consequently, sugarcane production is decreasing rapidly (20% drop in 10 years). However, the area under permanent grass (STH) and fruit trees has slightly increased. This does not compensate for the losses of sugarcane land. At the moment, sugarcane covers 53% of cultivable land. The STH and perennial fruit crop production cover 19% and 5% of cultivable land, respectively.

Appendix 3. Some characteristics of Réunion

In order to develop the study on the SAC learning processes and their impacts on the coordination between stakeholders, a work meeting was organised in 2005 to discuss the topic with development partners from Réunion. We used a Research-Action approach (Chia et al. 2008) and proceeded in three steps. The first step involved capitalising on the work conducted on SAC development and implementation and on the development of working hypotheses. The second step consisted of carrying out specific surveys with agricultural advisors and with people in charge of services in the Chamber of Agriculture and the Ministry of Agriculture's decentralised departments (Appendix 4). The purpose was to study what had changed and how. Those surveyed, particularly the technicians and farmers, were selected on the basis of their involvement in applying tools. The last step involved a 2-day work seminar with several participants (advisors and people in charge of professional organisations and state departments).

Twenty people from support organisations involved in implementing the SAC were interviewed. They included:

- Directors of the Chamber of Agriculture (3) for the west, south and east zones;
- Several extension technicians;
- Chamber's CDOA representatives;
- Environmental service;
- Charter service of development;
- Cane sugar production channel manager;
- CERFA, Centre d'Economie Rurale et de Formation Agricole (centre for rural economics and agricultural training);
- Coopvanille, cooperative of vanilla producers;
- Réunion Island Ecology, environmental protection group;
- SAFER, Société d'Aménagement Foncier et d'Établissement Rural, institution whose mission is to control land law and, more recently, the rural environment;
- CNASEA, Centre National pour l'Aménagement des Structures des Exploitations Agricoles, services that manage the SAC dossiers;
- APR, association for promoting the rural environment;
- CGPER, general confederation for small farmers from Réunion.

Appendix 4.

Thus, we focused on observations made after the analysis of the learning process. We built an assessment grid based on the identification of the state of knowledge (individual or collective), whose type is technical or organisational. Stakeholders apply managerial knowledge to deal with questions, phenomena, relational and organisational choices, as well as strategy planning issues (see Table 1).

		NATURE	
		Individual	Collective
TYPE	Technical	Technical system Technical itinerary	Technical reference, production standards, choice of varieties, etc.
	Organisational	Production system Commercial system Family farming system Relational system, etc.	Communication system at the local and regional levels Assessment and control tools Advising, etc.

Table 1. Learning sources according to the origin of the process

In the second step of the internal workshop, we chose to restore results for three reasons: to improve our understanding of the learning process being implemented; to define the types and nature of the learning process collectively; and to define actions that could be proposed for future improvements. Working groups and discussions were organised in plenary sessions. One of the major difficulties encountered when carrying out individual surveys on practices and representations was that we only had access to the justification model used by stakeholders and not to the action model (Argyris, 1993). Meanwhile, after examining the

changes and the way in which they occurred, it was possible to identify and characterise the learning processes. The work carried out during the restitution session with participants (work groups) also enabled us to identify the collective dimension involved in the learning process.

In order to analyse the learning processes developed during the SAC implementation phase in Réunion, we designed a grid for analysing changes in practice. These changes depend on the stakeholders' representation of their activity and the contexts of the action (Fig. 1).

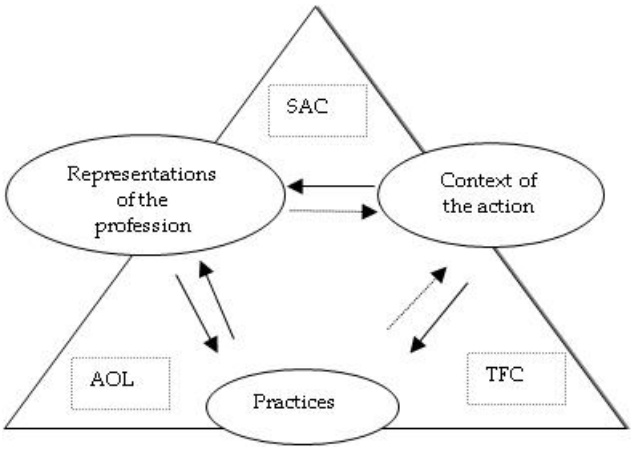

Fig. 1. A grid for analysing the changes in farmers' and advisors' practices (source: Chia et al., 2008)

This space can be characterised by a context of action, a product of the past, of social and political relationships and production. In some ways, it encompasses the work of stakeholders and the stakeholders' representations of their condition, the local agricultural context, as well as of the SAC context. In fact, the closer the actions proposed by this type of contract are to the farmers' representation of what should be done, the more likely they are to be adopted and accepted. Therefore, it is the work involved in "translating" and/or contextualising the TFCs (land management contracts) and then the SACs (sustainable agricultural contracts), *i.e.* the practices that will engender new learning.

4. The new SAC practices: Learning processes at stake

Our investigations identified the different learning processes resulting from the development and subsequent implementation of the SACs. They can be classified into three types (Table 2):

- Technical learning: environmental learning, mulching, etc.
- Organisational learning: new local or territorial organisations (commissions), new rules, renewed work within the CDOA.
- Social or relational learning: creation of new forms of coordination between farm advisors and farmers; emergence of new dynamics in the professional organisations; improvement in coordination between the state's services and the profession.

These learning processes are individual (farmers, advisors), as well as collective (organisations, groups, etc.). They can be produced using various aids and apparatus, such as training days, commissions, working groups, committees, the CDAO itself, for example. These learning processes and apparatus foreshadow a new system of local governance.

	Nature			
	Individual		Collective	
Type	Farmer	Technicians	Farmer	Technicians
Technical	Controlled herbicide use and fertilisation, etc.	GAFS[2], accounting, cartography	Environment, purchase	GAFS, plot record
Relational	Work with other farmers and family members	Workshop techniques, communication techniques	Meetings, joint AES work, definition, advising	Group workshop
Organisational	Plots, commercial work	Work planning, network management	Collective planning for specific task (CUMA)	Task division (SUAGER, ENV)

Table 2. Learning processes according to type and nature

The results presented in Table 2 show that implementing the SAC has encouraged different types of learning of various kinds. Therefore, the farmers developed new references and new management practices. These could be linked to the organisational dimension of the individual learning process, e.g. a technical action can lead to improved plot management. As far as the technicians are concerned, the learning process arose from the techniques used in group workshops and from the analysis of the function of the whole farm. The latter is a prerequisite for setting up the SAC because coherence is important, not only for a local project but, particularly, for farmers' individual projects.

The advisors had to conduct preliminary research to determine the zones likely to sign the SACs. Therefore, they used their knowledge and technical and social know-how (type of farmers). The work was conducted within the institutions, in this case within the SAFER, which acted as advisor for cane growers. Thus the SAFER advisors had to exchange and share information, etc. Training provides both a place and a context for crossed and multiple learning (Hatchuel, 1994). They benefited from learning and, in turn, proposed training courses on the AOL to farmers, including farmers that had signed up or completed the SAC. They had to persuade farmers individually to take part in this type of apparatus. The number of training courses and the number of farmers who participated are an indicator of the work that the advisor accomplished.

[2] The Global Approach of Farming Systems (GAFS) considers the function of a farm as a system with objectives and end targets. It is based on the farm's complexity in terms of all of its technical, economic, social and family dimensions.

5. How have stakeholders' practices changed?

Stakeholders adapt in many ways. Change occurs progressively, *i.e.* not all references are modified (Callon et al., 2009). Collective work involves the joint development of a project and a common language. Only by adapting ideas and actions can apparently opposed parties be reconciled in order to implement a project that interests everybody. The adaptation process also produces organisational and technical learning processes. Development practices, *i.e.* the way that stakeholders conduct their activity, represent the way stakeholders combine, hybridise and build tools, instruments, relationships, know-how and knowledge in order to carry out an action. We analyse the chronology and nature of the learning process using the example of the sugarcane SAC.

The SACs have had a significant impact on technical practices (Piraux et al., 2006). They have implemented positive developments for adopting certain techniques (Fig. 2). For example, 82% of the users who prefer late weed control have abandoned this practice and now weed during the grass pre-emergence phase or during the early post-emergence phase. Of the users interviewed during the survey, 77% of those who chose to apply the 'controlled weeding approach' on all their plots had not used this practice before. Two-thirds of the users, who did not split their fertiliser applications during the cutting phase, did so when it was not mandatory because of the SAC. Despite the difficulty involved in the mulching operation, the SAC was used to develop the practice. Residues were systematically kept on-farm and, therefore, were not problematic during the replanting phase.

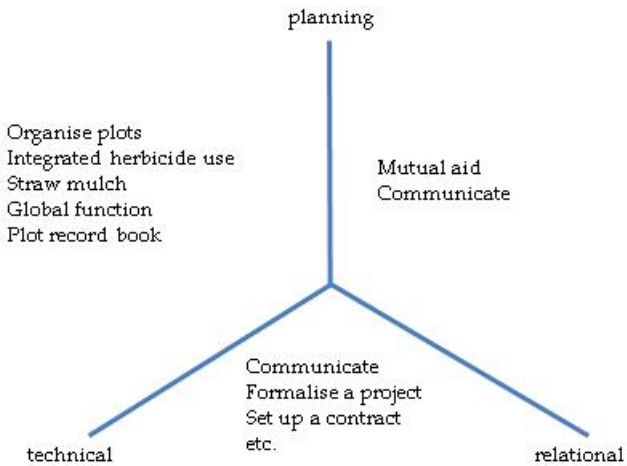

Fig. 2. What the farmers learned

The SAC also helped modify the organisation of work, especially during the cutting campaign. In addition it helped rationalise global soil management and define plots (which optimised the planning for replanting). Farmers unable to adopt the practices that they were supposed to adopt raised organisational issues relating to finance and labour force. However, the SAC was sometimes able to finance existing practices. Finally, the SAC tool seems to have accelerated the adoption of techniques that had been little used until then despite the fact that they had already been simplified by technicians.

The improvement was due to various elements: financial incentives; better training of the target public; effective assistance provided by technicians from the Chamber of Agriculture. For example, the assistance provided shed light on the general operation of a farm and thus revealed the factors that were slowing down the adoption of new techniques. Further study of the effective application of measures *in situ* over a longer period is required. In many cases, the grant provided by the SAC represented a major financial contribution and meant that the technical practices could be carried out at the appropriate time.

The technicians' action practices were also subject to change. Some of them have been identified as follows:

- Tools and methods: carrying out an agro-environmental assessment of the farm based on a more appropriate technical whole farm approach. This improves understanding of the factors affecting the adoption of techniques, advice, group work (workshops) and the use of computer tools.
- Labour organisation: according to the surveys carried out with some technicians, the SAC has given meaning to their work. Technicians worked with farmers to determine how to monitor indicators more clearly in order to help them achieve the objectives of their projects' action.
- Renewed references: they were made possible by keeping records, especially on areas of land.

Nevertheless, the changes raised a number of issues, especially issues of identity that we will discuss. The SAC was implemented using a new management apparatus, *i.e.* new relationships between different groups of stakeholders. The analysis of their intensity helped to clarify the mechanisms developed and to identify any dysfunctions. We thus identified five stakeholder groups: technicians, signatory farmers, professional organisations, support institutions and 'others' (representatives of civil society, development organisations, medical doctors, labour inspection, etc.). We would like to underline (Chia et al., 2006) the following, in particular:

- The improvement of mutual assistance between the technicians from the Chamber of Agriculture.
- The renewal of relationships between technicians and farmers: the different phases of the construction of the SAC project conducted jointly with greater confidence.
- The development of different relationships between farmers, especially the implementation of mutual support groups.
- The development of the relationships between many stakeholders and support institutions.
- The presence of new stakeholders for project preparation when requested by technicians: medical doctors, labour inspection, etc.
- The limited development of relationships with civil society organisations, which the AOL introduced as members in the CDOA: in Réunion, there are only two environmental protection organisations.
- The poor relationships between some members of the Chamber of Agriculture and the DAF, whose quality criteria for their case files were not well understood.
- The weak impact on institutional structures, which hinders internal reorganisation, with the exception of CNASEA.

Two working groups expressed the main issues that generated stakeholder interest (which is debatable) (Table 3).

	Group 1 = technicians	Group 2 = 'institutional' group
Aim of SAC?	- Environmentally friendly agriculture - Income/project - Reconciling agriculture and the environment - Reconciling agriculture and society - Farm viability and sustainability	- Non-commercial practices - Global Approach of Farming Systems (GAFS) - Controlled agriculture - Sustainable agriculture - New organisation for agricultural development - Image of agriculture in society
What was learned?	- Project/strategy - Training - Communication - Environment and production - Communication/training - Human and financial means - New awareness for farmers - Reassessment of the CDOA's role - Improved environmental knowledge	- Synchronising assistance - Objective of territory forum for discussion, evaluation and orie-ntation - Educational training - Improving knowledge for AES - Indicators of success

Table 3. Summary of the working groups' activities during the workshop

- The development of the nature, methods and conditions of work: technicians' points of view and, sometimes, those of different 'institutional' groups. Technicians expressed their dissatisfaction with regard to the quality of their new working conditions. They sometimes expressed themselves in a rather defensive and even negative way. They even compared themselves to 'office rats'. The institutions preferred to put emphasis on the technicians' acquisition of new methods even though the latter acknowledge the value of a global operational approach, *i.e.* the Global Approach of Farming Systems (GAFS).
- Relational changes are developed although the institutions contest that relationships between the technicians are more intense.
- The lack of assessment criteria and indicators. Technicians highlight the lack of tools or an inadequate understanding of the tools for conducting their work: assessing a situation, assessing the impact of developing the SAC on farms and their environment, adapting an AES (agro-environmental measure) to a specific situation.
- Finally, technicians from the Chamber of Agriculture consider that the quality of their daily work is hindered by the lack of human resources, as well as the fact that the departments were re-organised to improve the management of the 'new situation'.

Some technicians (including those from the Chamber of Agriculture) consider that the process of implementing the SAC has been too hasty. As a result, they were under

considerable pressure in terms of the number of SACs they had to manage. However, it seems that some farmers failed to conform to the contract they signed. Considerable differences exist between the observed practices and the 'optimal model'. This is positive and could systematically encourage new learning processes (Chia, Dulcire and Piraux, 2006). In any case, some people consider the tool to be very complex and have asked for it to be simplified or strengthened with additional human resources.

From the SAC perspective, a majority of the participants consider that the technicians from the Chamber of Agriculture should encourage more environment-friendly agricultural production, as well as encourage the development of non-commercial goods. However, they do emphasise the fact that this should not affect the farmer's income. Finally, a last group maintains that the SAC should primarily help guarantee the farmer's income. This opinion does not negate the importance of environmental management but rather the reluctance (and even incomprehension) of some people to stop supporting cane monocultures (both technically and financially). The institutional group stressed the tool's role in terms of renewing individual and collective approaches. Awareness like this is beginning to develop. However, concrete environmental outcomes of development operations should be defined both at the level of the farm and the farmer's project.

The objectives set out by the SAC seem quite clearly differentiated. Coherent strategies need to be developed in order to meet them. The necessary learning processes have not really been shared at all. In other words they have not yet made it possible to create a common language or joint projects. The specified learning required to meet these demands involves communication: dialogue, outreach, training for technicians and farmers so that coherent projects and strategies can be developed, as well as the construction of management apparatus. The latter refers to the creation of spaces for debate and confrontation (like the CDOA) that can particularly be used for synchronising working methods or criteria for evaluating dossiers. Thus, there has not yet been a real discussion about the meaning that should be given to the profession of farmer and advisor. The CDOA is actually recognised, above all, as a body for technical discussion. For example, some people think that "less multi-functional" production (livestock, fruit and horticulture) should benefit from the SACs because that is where major environmental improvements can be made. Consequently, the capacity for collective discussion should be strengthened on a county scale.

6. Sustainable agriculture and territorial governance: Back to learning

As Flichy (2007) has demonstrated, if agriculture is to be dynamic, it cannot just be based on a simple replica of the past: agriculture should be innovative in the socio-technical and organisational sense. SACs are tools, which have rapidly been adopted by agricultural development stakeholders and are the subject of intense debate. On the basis of observations that have been made, we make several recommendations to strengthen individual and collective learning, as a prerequisite to the continued implementation of the SACs. Lastly, the question of governance remains. Here, governance is understood to be the process to define and implement development action that associates all the stakeholders concerned (or at least all those who felt concerned). The question encourages further examination of the apparatus and tools that the stakeholders adopt, modify, set up in order to coordinate and develop a joint project and rules.

6.1 Redefining the farming and advisory professions: In terms of both techniques and representations

All the stakeholders consider that the establishment of SACs has generated a new dynamic in rural areas. SACs were the catalyst for a change in agricultural practices, as well as technicians' practices. The latter have modified their approach to intervention (global approach, agro-environmental appraisal, monitoring, etc.). The changes in these practices forecast a change in the different professions. Thus, we can see that some farmers are becoming more "professional". This is illustrated by: improvements in the quality of plot management (keeping a plot record book); rationalising and better planning of technical interventions; an understanding of the farms' global function, which raises environmental awareness. The profession of advisor for the Chamber of Agriculture has also developed considerably from that of providing technical advice, oriented to sugarcane, to that of providing "whole" farm advice, which greatly modifies the organisation and objective of work.

Therefore, if we want to modify farmers' practices, development practices have to change, *i.e.* the way that professions are actually exercised: how stakeholders combine tools, instruments, methodologies and relationships in order to carry out different development actions. However, the technicians feel a unanimous sense of dissatisfaction as a result of the major changes in their profession, which has seen a notorious increase in paper work. This is the source of unrest that needs to be addressed. Other questions prevail on the real evolution of farmers' practices. Consequently, major work should be conducted to (re)define the farming and advisory professions. In order to achieve this, the adequate apparatus (places, types of stakeholder) need to be identified.

6.2 Supporting new professions: With a new approach to the organisation of agricultural development, communication and better training

The stakeholders consider that one of the main weaknesses in the SAC contractual process is linked to inadequate communication and training to support the evolution observed in the professions. It is important for farmers to understand that the SAC is an innovative tool: help is given as a function of the "production methods" used and not the quantities produced. It is, therefore, important that the message given to farmers focuses on the environmental aspect of the SAC and the importance of respecting the commitments set out in the contract and not just on the help for finances and cash flow.

In practical terms, the different areas of training referred to include: environmental issues, the analysis of farmers' practices and their evolution, the GAFS type project approach (Global Approach of Farming Systems), which is very appropriate. In addition, it is essential to address the inter-relationships between these topics, as well as some rules of communication, which provide the basis for work on improving practices. Lastly, special effort is required to ensure that the elected councillors, particularly those who are involved in the different commissions, are aware of the professions' and SACs' new requirements.

6.3 Building strategic choices and a suitable system of evaluation

Group discussions and group work have shown that evaluation needs to be considered. We think that in the management system created by the SACs, it would be sensible to develop a

global evaluation system rather than use individual criteria. Evaluation is actually part of all management or governance processes. It should be considered as an instrument for planning and orientation and not as a tool for censorship. Consequently, evaluation should first establish strategic objectives that are clearly identified and ranked in hierarchical order to provide a framework for implementing SACs. The results from the working groups show that the objectives set by the SAC clearly differentiate between economic and environmental approaches and call for the development of coherent strategies. Depending on the financial package available, defining these objectives should make it possible to: 1) prioritise interventions according to specific target groups or fragile zones affected by the specific issues at stake (environmental or other), which will mean that SACs can be concentrated; 2) define the methods for supporting farmers outside the SAC, taking into account the time allocated to the SAC farmers.

The evaluation should cover different areas:

- The quality of the dossiers that determine the criteria for acceptance or rejection of the SACs proposed in the preliminary commission;
- The technicians' work, which is not what it used to be. This raises the issue of the need to identify work parameters clearly. The technicians are actually concerned because they do not know the evaluation criteria for their new functions and are worried about being penalised;
- The management of signatory farmers.

Another important point that should be underlined is the need to involve institutions in the process to determine a collective definition for criteria, rules, evaluation times, etc. If this does not happen, each institution develops their own system of evaluation and each individual will give priority to the criteria that they think they will be judged on. Thus, for example, an advisor will seek to meet the criteria for the number of dossiers if he thinks that he will be (or actually is) judged on numbers. He will give priority to "quality" if he is explicitly judged on that criterion. The danger is the emergence of evaluation systems that are not compatible. These concerns are linked to the suitability of the current evaluation system, which is the product of previous situations, and a pertinent system that takes account of the new functions attributed to agriculture and new professions.

6.4 Developing methods of coordination, as management apparatus

The objectives should be chosen after discussion on a local scale. However, apparatus (such as the CDOA) that has been strengthened by the AOL does not provide a forum for debate on joint strategy development. The CDOA is actually recognised as a body for discussing technical issues and not as a real commission for agricultural orientation. Nonetheless, it is important to remember that not everything can be discussed everywhere. Therefore, stakeholders need to organise themselves, set up modes of cooperation and coordination, rules that allow them to be represented within the different institutions where questions relating to SACs are discussed.

6.5 Strengthening organisational learning

The organisations have not encouraged the learning processes considered necessary in the light of current changes. The learning processes identified have not really been shared at all.

In other words they have not yet made it possible to create a common language or joint projects. Thus, there has not yet been a real discussion about the meaning that should be given to the profession of farmer and advisor. Consequently, in order to deal with changes and new requirements (dialogue, communication, etc.), the professional organisations have reproduced the same structures and have continued to organise their activities on a sectorial basis. The search for coherence with regard to the dossiers has led to the development of new relationships between the Chamber of Agriculture's different services. These links need to be strengthened.

7. Conclusion: Learning and governance?

Few studies have reported on the implementation and development of a contract as a stakeholder learning process. Indeed, the establishment of the CDOA and its subsequent extension to non-agricultural categories of stakeholders symbolises a change in the mode of state intervention in agriculture. Formerly, the state identified the rural actions that it considered appropriate, through state agencies linked to the Ministries of Agriculture, Research, etc. Since then, the state has promoted a new mode of governance in which the state liaises with local stakeholders to identify and implement actions. The French Agricultural Law has increased the complexity of rural and agricultural development issues by implementing a new type of action tool, namely the SAC. This allocates funds not on a quantitative basis but according to the 'production procedure' used. This represents a significant change, which some in politics call a "participative democracy" (Callon *et al.*, 2009). It constitutes a new form of rationality. As a result, all stakeholders in the rural and agricultural sector – in particular farm advisors and farmers – have to redefine their activities, tools, practices, *i.e.* their reference framework (what should be done, when, how and with what, etc.). We have observed that public policy tools have not only redefined the scope of stakeholders' action, particularly the nature of their relationships, but also developed different types of new learning processes (technical, economic and organisational processes) in addition to new processes of coordination. This degree of complexity means that we can no longer consider solutions from a purely technical point of view.

The new public policy tool has facilitated the progress of a new type of governance, by coordinating stakeholders with different interests and different logical devices. As a result, stakeholders' practical and organisational practices have developed. However, the process has not modified their values (common project) or the development model. Nonetheless, most of the learning processes have evolved as a single loop because the values and reference frameworks of the underlying development have not been taken into account. Similarly, multi-functional agriculture has not been integrated into this development approach.

Although stakeholders were involved in implementing and monitoring these tools, they were not really involved at the design stage for the local project. The purpose of this phase is to examine the role of agriculture in society and where the farming activity fits among other activities in the area. Training is necessary for the purposes of development support. However, a territorial project should be developed in parallel because it will be used for implementing public policies and relevant development actions. Therefore, the impact of territorial governance is limited. In fact, we have underlined the need to use a federative-type project for defining governance. Therefore, locations should be selected in which

stakeholders can define or redefine territorial values, as well as their objectives so that a dual loop learning process can be developed. The question of governance leads us to a critical examination of land management and rural development, the relationships between agricultural and non-agricultural stakeholders and the relationships between the government and farmers. In order to construct a joint project, territorial governance, as an innovative process, requires the effective participation of stakeholders at every stage so that defensive reactions can be avoided. We underline the fact that this type of participation for defining local actions and developing rules and institutional arrangements is difficult to implement and cannot be imposed.

Therefore, opportunities for collective thinking must be developed on a territorial scale so that actions have meaning, rules can be drawn up, new knowledge and know-how developed, etc. In other words, a flexible governance system should be set up within which resourcefulness and hybridisation are considered to be mechanisms of adaptation. Governance represents an adaptive approach in which the learning process is the key component to successful implementation. We believe that a research-action approach could help territorial stakeholders to grasp this dimension and, as a result, create adequate institutional organisations and sites for learning. However, we acknowledge that there is also the need for an analysis of the transition between individual and collective learning. All the indicators suggest that it is the intermediate situations - committees, focus groups, etc. - that facilitate the transition to a common language.

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