
What connection is there between the learning process and territorial governance? The 'SAC' example on Reunion Island

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Abstract: Territorial governance has become a major issue for public authorities. Studying the information generated by implementing sustainable agricultural contracts (SAC) on Reunion Island (Île de la Réunion) has contributed to the development of new types of territorial governance projects. The surveys conducted with rural development actors have revealed that learning was significant both at the individual and collective levels. This mainly involves organisational learning processes. The SAC tool has been used for developing a new type of governance, by coordinating actors with different interests and logics. This process has developed the practical and organisational practices of actors. But it has not modified their values (common project) or the development model. Thus, we believe that in order to promote 'dual loop' learning, implementing a local project is essential as it gives a meaning to the actions being carried out. As a result, the governance process would be reinforced.

Keywords: actors coordination; development model; dual loop; governance; learning process; organisation; Reunion Island; rural development; sustainable agricultural contract (SAC); territorial development; territorial governance.

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1 Introduction

Nowadays, territorial development is considered as a complex process with a socio-technical and organisational nature. It is thus appropriate to involve a significant number of actors in decision-making and action development. In the French agricultural and rural sector, and in the aim of promoting participation, the state authorities have set up various committees such as the CDOA (Commission Départementale d'Orientation Agricole)¹ or Agenda 21.

Social sciences have developed research work concerning the implementation of coordination methods between actors and regulatory systems but have not focused so much on territorial governance as a co-production process (between public and private actors) for actions, objectives and rules within a territory. However, for some years now, 'governance' has symbolised a new approach for managing relationships between the state authorities (which have been elected) and the population. The first impression obtained from our observations made in the agricultural and rural world is that these new processes, which attempt to harmonise rules with local needs and reconcile politics with popular thinking, are because of hybridisation and 'trial and error'. However, they are very informative for researchers interested in rural development and an organisational approach.

In this article, our aim is to contribute to debates so as to define and outline 'governance' while emphasising on the analysis of the relationships existing between the learning process and governance. Governance is a process enabling to associate, in a single project, actors with different logics and interests, either in relation to its development and execution, or to the development of operating rules. This term was first applied to companies for illustrating the relationships between shareholders and employees. It was then used to characterise the new relationships that the state (via decentralised services) has developed with the private sector. The aim is to set up the policies implemented at the national level or to develop new policies at the local level.

The problems related to governance, and in particular to its territorial dimension, have been identified recently by Simoulin (in Pasquier R et al., 2007, p.17). They have 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”. Governance therefore represents a possible solution for developing a new society-based project, in which, based on an updated social contract, participation can be included in the democratic representation. Governance would be close to organisational innovation (David, 1996), which is considered as a process. It would be the product of alliances, hybridisation, adapting many technical objects, as well as actors and situations.

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

During the research project² concerning the implementation of the French AOL (Agricultural Orientation Law) in 1999, surveys were performed with farmers, civil servants from the Ministry of Agriculture, employees from professional organisations (Agriculture Council, agricultural management centres, etc.) on ‘Reunion Island’ (Appendix A) about the way in which they contribute to clarifying and developing sustainable agricultural contracts (SACs; Piraux, Chia and Dulcire, 2006). This case is particularly interesting because these new tools no longer apply previous rules but propose a new reference system and approaches for agricultural and rural actors. The multiple functions of agriculture reflect its territorial insertion (Piraux, Chia and Dulcire, 2006) and assume that there are new relationships between the local actors.

The learning process will be clarified in the first part of this paper. Second, a description will be provided about our methodology and the main results we have obtained. The relationships existing between learning process and governance will be analysed in the conclusion.

2 Learning process: theoretical positioning

Research has been continuously developed on the learning process within an organisation since Argyris and Schön (1993) published their book on organisational learning process. Reference will therefore be made to their work. Their 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 assumes that for this transformation, organisation members need to modify their behaviour. Therefore, they have to learn and thus integrate new knowledge, techniques and mechanisms. The learning process can be used for facilitating or preventing change, such as the well-known defensive routines developed by the organisation members when they have not

contributed to defining the objectives or when changes generate doubts and modifications in their reference system. It can be said that 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 not handing files in on time, not signing them, etc. Argyris and Schön (1993) have shown that there are two types of learning processes within organisations. The first is a simple loop process that takes place 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 underlying³ ‘values’ (objectives, paradigm).

An organisational learning process is therefore defined as a process that enables the organisation actors 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, there exist major differences that must be clarified. Knowledge can be used for an individual whereas know-how concerns a group, i.e. its construction and legitimacy is defined by a group of actors: ‘...knowledge is therefore developed through experience. 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’ (Avenier and Schmitt, 2007, p.122).⁴ Thus, regarding the learning process analysis, observations are favoured. Thus, an assessment grid was built based on the identification of the state of knowledge⁵ whose nature is either individual or collective, whose type is technical, relational or organisational (see Table 1). Managerial knowledge is mobilised by the actors in order to deal with questions, phenomena, relational and organisational choices as well as strategy planning issues.

Le Bas (1993) has identified two dimensions in the learning process: an individual dimension and a collective dimension. He considers that “the learning is a process employed for acquiring knowledge”. It can generally be defined as an accumulation and memorisation process and above all concerns human beings in their social activities and in particular, their economic activity. Although it is obviously supported by an individual agent, it is also determined by the organisation in the institutional arrangements developed by the economic and social reports prepared by individuals.

Table 1 Learning sources according to the origin of the process

		<i>Nature</i>	
		<i>Individual</i>	<i>Collective</i>
Type	Technical	Technical system, technical itinerary, etc.	Technical reference, production norms, choice of varieties, etc.
	Relational	Family farming relational, communication techniques	Communication system at the local and regional levels
	Organisational	Production and commercial system, family farming system	Task division Assessment and control tools Advising, etc.

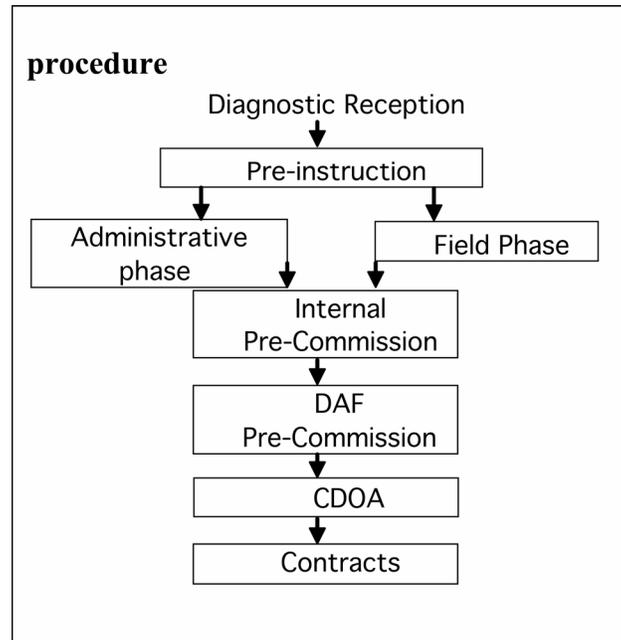
Our work has been organised around three research proposals developed based on surveys and observations.

- 1 Organisations must use ‘learning processes’⁶ in order to modify their practices and favour technical and organisational innovations.
- 2 The capacity of the agents to ‘learn’ determines the capacity of the actors and organisations to ‘change’. Hatchuel (1994, p.112) states that ‘collective learning process is not only a coordination regime between actors but it is also a training process for actors’.
- 3 The learning process represents a major component for governance and is necessary for developing and/or using new types of coordination and decision-making approaches for actors at a local level, which we have defined as governance.

3 The SAC: new tools for agricultural policies

Our reflection has focused on developing an agricultural policy tool, the SAC. The SAC is a major innovation for supporting agriculture as it is a contract between the farmers and the French state. It is based on a global project defined by the farmer in the aim of developing a multipurpose activity. It was intended to contribute to the economic development of agriculture, to the protection and management of natural areas and to the balance of territories and employment. With this contract, the state, with the help of the European Union, provides financial support to the farmer over a five-year period. The SAC has two main dimensions: an economic and social dimension, on the one hand, and a territorial and environmental dimension, on the other hand. In order to give a sense of responsibility to all of the actors involved and to simplify the operative stage, a major role is given to the departmental and regional levels in the implementation of the SAC, in particular for defining priority territorial issues and developing investment financing rules.

Figure 1 illustrates the route followed by the SAC files and the relationships developed between the different actors as well as the situations that are encountered. First, farm advisors must determine the best areas for applying SAC. Therefore, they must mobilise technical knowledge and know-how within the area, as well as related social characteristics (type of farmer). This work is performed within the institutions and then between institutions in the commission prior to the CDOA phase. Following this, they must propose training sessions for farmers on SAC rules and principles. It is to be underlined that the number of training sessions and the number of farmers to have participated represents a good indicator of the work completed by the farm advisors. In this new context, we decided to analyse the training sessions organised in rural environments in which the agricultural model is (re)defined.

Figure 1 SAC implementation procedure

4 Methodology: a participative and comprehensive approach for studying the learning process

On Reunion Island, the first analysis of the comprehensive surveys carried out with the actors concerned the implementation of the SAC. It enabled us to identify that the learning process is a key issue for optimising the organisation of the system and inter-actor relationships.

In order to develop the study on the SAC learning process, a work meeting was organised with the development partners from Reunion Island to discuss this topic. We used a Research-action approach (Chia, Dulcire and Piraux, 2005) and proceeded in three steps. The first step involved capitalising work on SAC development and implementation and on developing working hypotheses. The second step consisted in carrying out surveys with agricultural advisers (10) and people in charge of the Agriculture Chamber and SAFER⁷ (5) and of the decentralised departments of the Ministry (3). The purpose was to study what had changed and how.⁸ These people, in particular the technicians and farmers, were selected based on their implication in tool application. The last step involved a two-day work seminar with several participants (advisers and people in charge of the professional organisations and state departments).

The surveys were performed according to the guide based on changes in practices and learning processes. We also used data from former studies on the SAC implementation (Bonnal et al., 2003) in 2002 and 2003 and data from the analysis on the development of agricultural practices in 2003⁹ (Piroux and Pangolin, 2004).

The internal workshop preferred to restore results. There were three purposes for this restitution: to improve our understanding of the learning process being implemented; to collectively define the types and nature of the learning process; and to define actions that could be proposed for future improvements. Work groups and discussions were organised in plenary sessions. One of the major difficulties encountered when carrying out individual surveys on practices and representations was only having access to the justification model of actors but not to the action model (Argyris and Schön, 1993). Meanwhile, through these changes and the way in which they occurred, it was possible to identify the learning processes and their nature. The work carried out during the restitution with participants (work groups) also enabled us to identify the collective dimension of the learning process.

In order to analyse the learning processes developed during the SAC implementation phase on Reunion Island, we designed a grid for analysing practice changes. These changes depend on the representation that actors have of their activity and action contexts.

5 How have actors' practices changed?

The multiple adaptations that actors have to implement are carried out progressively without modifying all of the references (Callon, Lascoumes and Barthes, 2009). Collective work involves developing a project and a common language jointly. It is only by adapting ideas and actions that these apparently opposed parties will be capable of implementing a project that is of interest for everybody. The adaptation process will also produce organisational and technical learning processes. Development practices, i.e. the actual manner in which actors perform their activity, represent the manner in which actors combine, hybridise, build tools, instruments, relationships, know-how and knowledge in order to carry out an action or for personal coordination. We are going to analyse the chronology and nature of the learning process based on the sugarcane SAC example.

The SAC has had a significant impact on technical practices (Piroux et al., 2004). They have implemented positive developments for adopting certain techniques. For example, 82% of the users preferring a belated weed control approach have abandoned this practice to weed during the grass pre-emergence phase or during the early grass post-emergence phase. Among the users interviewed during the survey, 77% of those who chose to apply the 'controlled weeding approach' over their entire surface area did not employ this practice before. Two-thirds of the users, who did not sub-divide their fertilisers during the cutting phase, adopted this practice when it was not mandatory because of the SAC. In spite of the difficulty involved in the mulching operation, the SAC was used for developing the practice. Residues were systematically kept in the farms and therefore were not problematical during the replanting phase. The SAC also contributed to modifying the work organisation, especially during the cutting campaign and for the rationalisation of the global cane sole management while defining plots (which optimised replanting planning). Those who could not adopt the practices that they were to use raised financial and labour force organisation issues. However, at times, the SAC has also been an opportunity for financing pre-existing practices. Finally, this tool seems to have accelerated the implementation of techniques that have already been simplified by the technicians but which have not been frequently used.

This improvement is because of various elements: financial incentives (in many cases, the subvention provided by the SAC represented a major financial contribution for carrying out the technical practices at the appropriate time); better training of the target public; efficient assistance from technicians from the Agriculture Chamber (who enabled to understand the general operation of a farm and thus the factors slowing down the adoption of these techniques). It would be necessary to be able to study the effective application of measures onsite over a longer period.

Changes also affected the action practices employed by technicians, in terms of the following.

- 1 Tools and methods: carrying out an agro-environmental assessment of the farm based on a more appropriate technical argument from a global approach. This enables a better understanding of technique adoption factors, synthetic advice, group work (animation) and the use of IT tools.
- 2 Labour organisation: according to the surveys carried out with certain technicians, the SAC has given a meaning to their work (developing a project whose action objectives are better defined with farmers, implementation of monitoring indicators).
- 3 Renewed references (made possible by keeping records, especially records on surface areas).

These changes have nevertheless raised certain issues, especially identity issues that we will still discuss.

The SAC was implemented through new relationships between different groups of actors. The analysis of their intensity enabled in the clarification of the developed mechanisms and to identify any dysfunctions. We thus identified five groups of actors: technicians, signatory farmers, professional organisations, support institutions and 'others' (representatives of the civil society, development organisation, medical doctors, labour inspection, etc.). We would particularly wish to underline (Dulcire, Piroux and Chia, 2006) the following.

- The improvement of mutual assistance between the technicians of the Council of Agriculture.
- The renewal of relationships between technicians and farmers: the different phases of the construction of the SAC project that is carried out jointly with reinforced confidence.
- The development of relationships between farmers (especially the implementation of a mutual support group).
- The development of the relationships between many actors and support institutions.
- The presence of new actors when requested by technicians for preparing the project: medical doctors, labour inspection, etc.
- The restricted development of relationships with the civil society, the AOL introduced in the CDOA, two associations of environmental defence.
- The degraded relationships of certain members of the council with the DAF, whose quality criteria for their files were not well understood.

- The weak impact on institution structures, except for CNASEA, which hinders internal reorganisation.

The main subjects generating the actors' concern,¹⁰ whether this is agreed or not, were expressed by two work groups (Table 2).

- The development of the nature, methods and conditions of work: technicians' points of view and, at times, those of different 'institutional' groups. Technicians expressed their dissatisfaction regarding the quality of their new work conditions (expressed, at times, in a rather defensive, and even negative way). They even compared themselves with 'office rats' as institutions preferred to underline the acquisition of new methods by the technicians even if the technicians acknowledge the interest of a global operating approach.
- Relational changes are developed but the intensification of relationships between the technicians is contested by the institutions.
- The lack of assessment criteria and indicators. Technicians underline the lack of tools or the insufficient understanding of these tools, in the aim of directing their work: assessing a situation, assessing the impact of developing the SAC on agricultural farms and their environment, adapting an MAE (agro-environmental measure) to a specific situation.
- Finally, technicians from the chamber consider that the lack of human resources as well as the reorganisation of the departments in order to improve the management of the 'new situation' hinders the quality of their daily work.

Table 2 Synthesis of activities of the working groups during the workshop

	<i>Group 1 (technicians)</i>	<i>Group 2 ('institutional' group)</i>
SAC for?	Agriculture respectful of the environment Income/project Reconciliation agriculture and environment Reconciliation agriculture and society Farm viability and sustainability	Non-commercial practices *GAEE Controlled agriculture Sustainable agriculture New organisation agriculture development Image of agriculture in society
What was learned?	Project/strategy Training Communication Environment and production Communication/training Human and financial means New consciousness for farmers Reassessment of the CDOA's role Better knowledge of our environment	Harmonisation of assistance Objective by territory forum for reflection, evaluation and orientation Educational training Improvement of knowledge for MAE Success indicator

*GAEE, Global Approach of Agriculture Farms.

Some technicians (within or without the chamber) consider that the process of implementation of SAC has been too hasty; this put them under a lot of pressure with respect to the number of SACs to carry out. However, it seems that not all farmers carried out their work in conformity with the contract they signed. It is positive to admit that great differences exist between the observed practices and the 'optimal model', which could systematically favour new learning processes (Chia, Dulcire and Piraux, 2005). In any case, the tool is considered by some people as very complex and requests to be either simplified or reinforced by complementary human resources.

From the perspective of the SAC, according to a majority of the participants, the technicians of the Chamber of Agriculture should encourage a greater respect of the environment in the field of agriculture production, and also favour the development of non-commercial goods. However, this acknowledgement should not affect the farmer's income. Finally, a last group claims that the SAC should first of all help guarantee the farmer's income. This affirmation does not represent the negation of the importance of environmental management but rather the reluctance (and even incomprehension) from some people to stop assisting exclusive (both technically and financially) cane production. As for the institutional group, it rather stressed the role of the tool in renewing individual and collective approaches. Such awareness is beginning to develop: it requires the definition of environmental outcomes in development operations, and their expression in a concrete way both at the level of the farm and of the farmer's project.

6 Back on the learning approach

All participants consider that the setting up of the SAC has created a new dynamic in the agriculture society. The SACs brought about the evolution of the farmers' practices as well as those of the technicians whose logic of intervention was modified (global approach, agri-environment diagnosis, follow-up, etc.)

The accomplishment of a detailed analysis of the various aspects of the learning processes enabled us to identify the following typologies (Table 3).

- 1 Technical learning: environmental learning, mulching, etc.
- 2 Organisational learning: new local or territorial organisations (commissions), new rules, a renewed work within the CDOA.
- 3 Social or relational learning: creation of new ways 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.

The farmers therefore developed new references and new management practices. These could be put in relation with the organisational dimension of individual learning process; e.g. a technical action can lead to a better management of the plots. As far as the technicians are concerned, the learning process arose from the techniques of group animation and from the analysis of the global functioning of agriculture farms that are necessary for the SAC installation, as it is important to be coherent not only with a local project but also mostly with the farmer's individual project.

Table 3 Handouts and situations of learning processes according to their type and nature

<i>Type</i>	<i>Nature</i>			
	<i>Individual</i>		<i>Collective</i>	
	<i>Farmer</i>	<i>Technicians</i>	<i>Farmer</i>	<i>Technicians</i>
Technical	Controlled weed killers and fertilisation, etc.	GAAE, accounting, cartography	Environment, purchase	GAAE, parcel report
Relational	Work with other farmers and family members	Animation techniques, communication techniques	Meetings, joint work of MAE, definition, advising	Group animation
Organisational	Plots, commercial work	Work planning, network management	Collective planning of specific task (CUMA)	Task division (SUAGER, ENV)

These types of learning processes are individual (farmers, farm advisors) or collective (organisations, groups, etc.). They are acquired through the reading of handouts as well as through various possibilities of meeting like days of training, commissions, working groups, committees and the CDOA itself. These ways of learning and communication prefigure a new local governance system.

It is certain that the participants acquired new skills and knowledge, which brought about some obvious changes. However, this learning was not, or only in a limited way, shared between actors, i.e. it has not been able to create a common language or common projects that would bring together a majority of the actors. A more thorough analysis shows that the types of learning process that are necessary to respond to these needs are more relational (dialogue, training) as regards technicians and farmers: what is needed is the creation of a forum for debates, a possibility of dialogue and confrontation (as the one offered by the CDOA) in order to harmonise objectives, working methods or criteria for the evaluation of files. The CDOA is indeed recognised as an organisation intended for technical discussion. For example, some people think that the production lines to benefit the most from SAC are those considered as 'less multifunctional' (breeding, fruit production and gardening), because it is where achieving progress in environmental terms is the most important. Consequently, this drawback in defining collective objectives has generated a certain number of defensive routines, e.g. as a result of the technicians' dissatisfaction caused by disorganisation in their profession accompanied by a significant increase of office work.

However, although faced with changes and new necessities (dialogue, communication, etc.), professional organisations have reproduced the same institutions and have continued to organise their activities as before, or even developed defensive routines. In the case of the Reunion Island, it is clear that organisations have not completely favoured the double-loop learning process although it is necessary for the current changes.

7 Organisational innovations to be consolidated

Based on our results, we formulate here some recommendations that seem useful for implementing the SAC.

7.1 The redefinition of the profession of farmer and farm advisor

The evolution of farmers' and technicians' practices announces a change in these professions. A certain 'professionalisation' is thus to be witnessed among certain farmers. When the aim is to modify farmers' practices, however, it is also important to implement development practices. These are practical ways to exercise professions, i.e. the ways in which professionals combine tools, instruments, methodologies, relationships, in order to achieve the different actions of development. An important role for the institutions could consist in (re)defining the professions of the farm advisor and farmer while identifying adequate systems (places, types of actors) enabling success.

This redefinition of professions has to be accomplished through communication or through reinforced training, which workshop participants consider as one of the principal drawbacks in the implementation of the SAC. Training is in fact considered as a place of crossed and multiple (Hatchuel, 1994) learning situations.

7.2 Strategic choices and the definition of an appropriate evaluation system

In the management situation of the SACs, it is important to consider a global evaluation system rather than to look for isolated criteria. Indeed, evaluation is part of every management or governance process. It has to be considered an instrument of planning and orientation instead of a censoring tool. Thus, the main aim of evaluation is to elaborate clearly identified and hierarchical strategic objectives that can be used to structure the setting up of the SAC.

Another principle that is important to be underlined is the necessary participation of all institutions in the collective definition of criteria, rules, evaluation periods, etc. But contrary to this, each institution still develops its own evaluation system and each person still gives preference to the criteria on which he thinks he is being evaluated. Therefore, e.g. an agriculture extension technician will try to satisfy a number of criteria if he thinks he is evaluated (whether or not he is effectively evaluated) on that number, while he will give preference to 'quality' if he is explicitly evaluated on this criterion. There is a risk of incoherent evaluation systems that appear among these. Such preoccupations concern the appropriateness of the current evaluation systems inherited from past situations compared with a relevant system that would take into account the new functions assigned to agriculture and modern professions.

7.3 An organisational evolution of institutions

The selection of these objectives has to be the product of a debate organised at the local levels. But the systems whose roles were reinforced by the AOL, such as the CDOA, do not call for debate or controversy in order to elaborate common strategies. The CDOA is indeed recognised as a body intended for technical discussion and not as an actual commission for agriculture orientation. Nevertheless, it is good to keep in mind that everything cannot be discussed everywhere. The actors have therefore to organise

themselves, to establish methods of cooperation and coordination, rules that enable them to be represented in different organisations where questions relating to SAC can be discussed.

8 Conclusion: learning process and governance?

French Agricultural Law has increased the complexity of the rural and agriculture development issue by implementing a new type of action tool, the SAC, which grants funds not on a quantitative basis but according to the 'production procedure' employed. As a result, all actors from the rural and agriculture sector – in particular farm advisors and farmers – must 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 action scope of the actors, and in particular the nature of their relationships, but have also developed different types of new learning processes (technical, economic and organisational processes) as well as new coordination processes.

As such, the new public policy tool has implemented a new governance approach. However, learning processes have mainly been carried out as a single loop because of the fact that the values and reference frameworks of the underlying development had not been taken into account. Similarly, multifunctional agriculture has not been integrated into this development approach.

Although actors have contributed to implementing and monitoring these tools, they have hardly been involved at the definition stage of the local project. The purpose of this phase is to examine the position of agriculture in society and that of the farming activity among other activities of the area. Training is necessary for support purposes. However, a territorial project must be developed in parallel as it will be used for implementing public policies and relevant development actions. The impact of territorial governance is thus limited. In fact, we have insisted on the need for using a federative-type of project for defining governance. Therefore, locations should be selected in which actors can define or redefine territorial values as well as their objectives, in order to allow a dual loop learning process.

In order to construct a joint project, territorial governance, as a participatory, non-hierarchical process, requires an effective participation of the actors at every stage, in order to prevent defensive routines. We insist on the fact that this type of participation for defining local actions and elaborating rules and institutional arrangements, is not easy to implement and cannot be imposed.

It is therefore necessary to reinforce collective thinking opportunities at a territorial scale, to provide actions with a meaning, to elaborate rules, new knowledge and know-how, etc., i.e. to set up a flexible governance system in which resourcefulness and hybridisation would be considered as adaptation mechanisms. Governance represents an adaptive approach in which the learning process is the key component to a successful implementation. We believe that a research-action approach could help territorial actors to integrate this dimension and, as a result, create adequate institutional organisations and learning locations.

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Notes

- ¹ The CDOA brings in relation the State Regional Representative (Prefect) with the departmental services of the Ministry of Agriculture (DAF, persons in charge and technicians of Management of the Agriculture and the Forest, etc.) and with the agricultural producers so much at the individual level than the collective (Council of Agriculture) and with the other actors of rural development like the agricultural consumers' associations, employees and natural parks.
- ² Multifunctional system financed by INRA, CIRAD and CEMAGREF.
- ³ They modify the current theory of action in the organisation.
- ⁴ A book in which eight researchers in management and education sciences met to confront their opinions (work) on actionable knowledge and knowledge of action.

- ⁵ The state of knowledge could be assimilated to a practice, an actual manner for performing an activity or task (Chia, 1987). However, a practice could be the product of various knowledge and know-how.
- ⁶ Hatchuel (1994) also talks of crossed learning processes necessary for organisational innovations.
- ⁷ Société d'Aménagement Foncier et d'Établissement Rural, institution whose mission is to control land-law and recently the rural environment.
- ⁸ About 20 people from support organisations involved in the SAC implementation were interviewed: from the Chambers of Agriculture (responsible for the west, south and east zones); environmental service; charter service of development; the cane sugar production channel manager, some technicians, representatives of the chambers of CDOA; CERFA (Centre d'Economie Rurale et de Formation Agricole); Coopvanille; Reunion Island Ecology (association of environmental defence); CNASEA (instruction services of files); APR (Association for promoting the rural environment); and CGPER (General confederation for small farmers from Reunion island).
- ⁹ These results are from a survey carried out with technicians from the Chambers of Agriculture and 45 farmers in 2003. The opinion of the interviewed farmers was analysed first. Practices were not monitored in 2003–2004 as this farming period represented the first year during which the CAD was applied for a considerable proportion of the contractors.
- ¹⁰ Warning: these results are based on agreements and disagreements with the previous assessment presented in this paper and were not the result of a discussion on assessment approaches. In that case, the results would definitely be different.

Appendix A: Some characteristics of the Reunion Island

Reunion is an island of 2512 sq. km, which consists entirely of basalt because of lava flows reaching up to 4000 m deep below the sea level. Located in the archipelago of Mascareignes in the open Indian Ocean, it is a French Overseas Department. Two great territorial units are commonly distinguished: lowlands and highlands. The lowlands correspond to the area where most sugarcane is grown and lie between 0 and 400 m, whereas the highlands are the areas situated above 400 m. In 1997, the population was 741,000 inhabitants with a growth of 1.6% per annum.

Although agriculture, including forest exploitation, takes up most of the space, it is not the main economic activity on the island: in 1997, the tertiary sector represented more than 72% of the added value; the secondary sector represented 22.3% and agriculture only 5.3%. The sugarcane acreage, advantageously located in the lowlands, is particularly affected by urbanisation and thus decreases strongly (20% decrease in ten years), but the uncultivated area ('surface toujours en herbe', STH) and the fruit-tree area slightly increased without compensating for the losses of the sugarcane. Currently, the sugarcane concentrates 53% *more of* the available agricultural area ('superficie agricole utile', SAU) while the shares of the STH and of permanent fruit crop production are 19% and 5%, respectively.

From 1989 to 2000, a third of the farmers ceased their activity. There were 9300 farms in 2000 with a prevalence of small ones (<5 ha). In fact, cessation concerned primarily farms that were smaller than 5 ha. At the same period, 50% of the farms grew sugarcane (4800 farms) and approximately 4500 farms based their activity on breeding (pigs, poultry, bovine meat and bovine milk). More and more farms use livestock as a means of speculation, whether it is their principal production or it is associated with sugarcane production.