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## Concerted approach to land-use management: developing common working procedures. A Cevennes case study (France)

Nathalie Couix\*

*Département Systèmes Agraires et Développement (SAD), Centre de Recherches de Montpellier, Unité Mixte de Recherche "Innovation: Changement Technique, Apprentissage et Coordination dans l'agriculture et l'agro-alimentaire" (UMR INNOVATION), Institut National de la Recherche Agronomique (INRA), 2, place Pierre Viala, 34060 Montpellier Cedex 1, France*

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### Abstract

In France, after several years of hesitation in defining concrete ways of working to implement land-use management projects, practitioners have reached a general consensus concerning the need to use concerted approaches. In the literature, these approaches are usually studied as negotiation procedures between actors. In this article, the author develops an analytical framework drawn up in terms of project design processes. This analytical framework is applied to the case of a fire prevention operation (Cevennes-France). The results bring to light the need to develop common working procedures. Then, these results, and the pertinence and limits of the interpretation framework, are discussed. © 2002 Elsevier Science Ltd. All rights reserved.

*Keywords:* Land-use management; Concerted approach; Design activities; Forest fire prevention; Southern France

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### Introduction

Since the late 1980s, France has been the site of intense initiative in land-use management organised at the local level by elected officials, professional groups, or even technicians from socio-professional organisations and the administration. After several years of hesitation in defining concrete ways of working to implement such operations, practitioners have reached a general consensus concerning the need to use concerted approaches involving the parties concerned (CELAVAR, 1998; CEDAG, 1999; PRESAGE, 1995).

Generally speaking, the term 'concerted approach' refers to the practice of individuals exchanging points of view to develop a project in common. In the literature, these exchanges are usually studied as negotiation procedures between actors with different or even diverging interests. Such are, for example, the 'approches patrimoniales' which have been extensively developed in France (de Montgolfier and Natali, 1987; Barouch, 1989; Ollagnon, 1989; Mermet, 1992; Poux and Mermet, 1998). Other studies analyse such exchange as an elaboration of agreements by identifying the

different registers of justification mobilised by the actors according to "economies de la grandeur" principles (Barbier, 1997; Beuret, 1999; Roque, 1997). Such analyses focus, in fact, on the elaboration phase of action schemes which will be implemented and do not concern themselves with either the future of projects or with actions which have been carried out.

The present article covers a relatively long time span (15 years). In it we analyse the results of the concerted process set up by a group of technicians to develop and run a land-use management project aimed specifically at forest fire prevention in the Cevennes (southern France). Our assessment shows that thirteen years after the beginning of the project the original goals in forest fire prevention remain largely unachieved (Couix et al., 2000) in spite of true collective work among the technicians during the development of the land rehabilitation plan. To fully understand this relative<sup>1</sup> failure, it is not sufficient to simply refer to previous approaches. We, therefore, developed an analytical framework drawn up in terms of project design processes, thus

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<sup>1</sup>We prefer to say "relative" since from certain points of view (development of forestry activities, aid to farms) this operation had a much more positive impact, as has been explained elsewhere (Collective 2000).

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\*Tel.: +33-4-99-61-27-41; fax: +33-4-67-54-58-43.

E-mail address: couix@ensam.inra.fr (N. Couix).

making it possible to analyse the content of inter-actor exchanges from the angle of the types of co-operation they permitted. Such an approach led us to distinguish between different forms of knowledge to be shared during the processes, particularly knowledge relating to common working procedures.

We will firstly go through the chronology of the project. Secondly, we will present our analytical framework before applying it to the case. We will then comment on the results of this analysis, results which bring to light the need to develop common working procedures, and we will show the extent to which the results are of interest even beyond the context of our case study. Lastly, we will discuss the pertinence and limits of our interpretation framework.

### Land rehabilitation operation for the Cevenol maritime pine area

#### Study zone and research procedure

The case study concerns a land rehabilitation project for the Cevennes maritime pine area (Gard Cevennes region, see Fig. 1) called the Col de Portes operation, which was begun in 1986 following a severe forest fire. This small area, which lies in medium altitude Mediterranean hills, has greatly suffered from rural exodus after the closing of the coal mines. The present-day landscape is characterised by large forests, as shown in Table 1. These forests are in very poor condition and strongly susceptible to forest fire. Indeed, the maritime pine, the main species introduced at the time of the mines to produce wood for pit props, was exploited in the worst possible way: the best trees were cut and the least valuable trees were left standing. When the mines

closed, these trees had very little value and were simply abandoned. Landed property is segmented and cultivable plots scarce. Farmers in the region therefore turned to herding goats for cheese production or to raising sheep for meat. Pasturelands, mainly wooded, represent up to 95% of the areas used by the herds.

The land rehabilitation operation has evolved through several phases of collaboration between researchers from different disciplines along with local technicians (from development agencies, administrative agents, etc.). Early collaboration aimed at both drawing up the initial rehabilitation proposals and designing the means of their implementation and follow-up. Informa-

Table 1  
Woodland of the communes of the maritime pine area<sup>a</sup>

Communes	% (Woodland/total area)
Aujac	71
Bessèges	59
Bordezac	90
Chambon	81
Chamborigaud	86
Concoules	85
Gagnières	72
Génohlac	82
Grand-Combe	69
Laval-Pradel	73
Martinet	85
Peyremale	84
Portes	87
Robiac	65
Ste Cécile d'Andorge	84
St Florent/Auzonet	60
Sénéchas	88
La Vernarède	88

<sup>a</sup> Source: IFN, (1992).

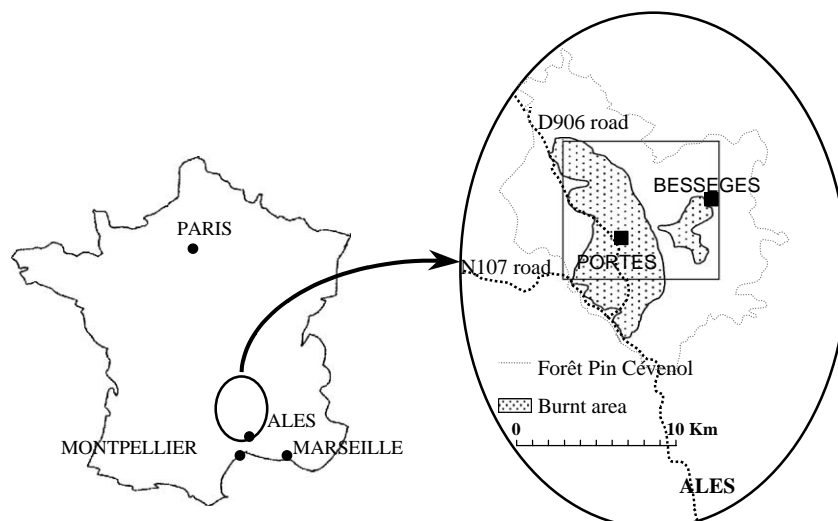


Fig. 1. Location of the Col de Portes operation.

Table 2  
List of data

Period	1986	1987 to now
Data	Minutes of Technical Cell meetings; President's notes of Technical Cell meetings  Working papers of the Technical Cell  Technical Cell's final report	Administrative files; Written description of the farm technicians' approach from 1987 to 1991 (working paper); Interviews with the ONF technician and the forestry technician from the Technical Cell; Interviews with farmers and private forest owners involved in the operation; Statements of the different technicians; Notes of current workgroup meetings; Vegetation and zoning maps, maps of fire-sensitive zones, locations of actions carried out.

tion extracted from such proceedings makes it possible for us to develop an overall picture of the procedure implemented throughout the operation, from its inception in 1986 up to the present (Table 2).

Since 1995, we set up a participatory research framework which, besides the researchers, includes technicians from the main institutions that were represented in the 1986 working group (see below). The goal of the work has been, in part, to assess the pertinence of the land rehabilitation plan with the local technicians from several points of view and from a 15-years vantage point. Another part of the goal, and that which we are interested in here, is to gain a better understanding of the procedures implemented in drawing up the general proposals, developing concrete actions with the beneficiaries of the operation (farmers, foresters, State forestry managers, local communities) and implementing these actions. The work in which we are engaged within this group aims at bringing the technicians to reflect upon their own intervention practices.

### *Chronology of the operation*

From the 9th to the 11th September 1985, forest fire ravaged 4500 of the 20,000 ha comprising the Cevenol maritime pine massif. The Forestry Minister requested that a workgroup be rapidly set up to draw up methodological proposals for rehabilitating the area. The initial goal was to avoid redeveloping the area identical to the past so as to avoid its excessive vulnerability. The proposals were to be ready by October 1986, to allow a rapid start to the work.

### *Setting up the workgroup*

In January 1986, a workgroup, named the 'Technical Cell', was set up and a researcher from the INRA<sup>2</sup> was named to preside over it. The group included 10 permanent members:

- a technician from the National Forest Service (Office National des Forêts, ONF hereinafter), the French national body in charge of managing forests belonging to the State,
- a forestry technician from the private forestry sector,
- technicians from the livestock farmers,
- a game technician,
- State representatives: Agriculture Department (DDAF hereinafter), Equipment and Rural Development,
- a representative from the Ales subprefecture.

To follow and validate the work of the Technical Cell, a group composed of about 32 people—called the Enlarged Group—was also set up. This group was presided over by the Prefect of the Gard and included locally elected officials, administrative managers and professional representatives from the Department and the region, as well as representatives from the communities of the region.

### *Phase 1: Drawing up an overall land rehabilitation plan for the area*

From January to October 1986, the Technical Cell met about ten times, sometimes for two days in a row. The first meetings consisted of field tours organised by the different members of the Cell: visits to the devastated zone and the old mine tips, visits to the farms which had switched to raising goats and sheep and visits to sylvopastoral developments. In parallel, meetings were organised with the different actors in the field: livestock farmers interested in land restructuring and forest owners. The members of the Technical Cell also met with foresters as well as with different actors from sectors of agricultural production.

The members of the group thus carried out a historical analysis of fires to identify the routes such fires tended to take. To help with this work, a fire-fighter specialised in fire propagation and a forester specialised in fire prevention were brought in. On the basis of this study and the visits they had made, the Technical Cell worked out a general rehabilitation plan for the area and drew up proposals about the means of exploitation of the region by farming and forestry. The operations of two subgroups can be identified during this period. The first, made up of the forestry technicians and the fire-fighter, drew up a map of the fire risk zones, identifying three types of zones according to their strategic importance in the propagation of fires. The farm service

<sup>2</sup>Institut National de la Recherche Agronomique.

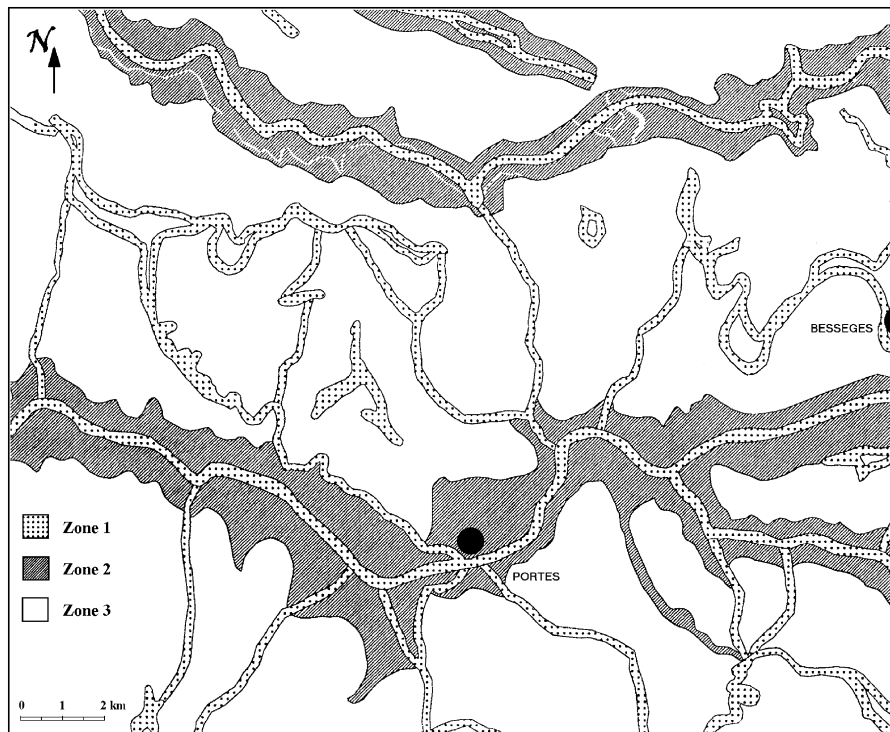


Fig. 2. General land rehabilitation plan of the maritime pine area. Three types of zones have been identified according to their strategic features in the propagation of fire: Zones 1: key zones, privileged fire trajectories or strategic zones for fire fighting. Their spatial planning is a priority and their management rigorous. They form the core structure of the land rehabilitation plan; Zones 2: support zones for the above. Their planning is designed to limit risks and permit easy access for fire-fighter intervention in Zones 1: silvopastoral organisation and association of livestock and forestry; Zones 3: far less vulnerable owing to spatial organisation plan applied in zones 1 and 2 (Source: M.C. Léouffre, INRA Ecodéveloppement).

technicians drew up simulation models of the techno-economic functioning of farms susceptible of contributing to restructuring ground cover. During the summer, the members of the Technical Cell revisited the area to evaluate the relevance of the zoning proposals drawn up by the foresters and fire-fighters. As for the farm technicians, they met several times during the summer to continue their work on farms.

The proposed plan identified three types of zones according to their strategic importance in the propagation of fires. For each of these zones, advice was given in terms of value added exploitation (see Fig. 2). The whole set of proposals served as the subject of an illustration for a totally devastated sector which was quite central to the rehabilitation of the hill massif (see Fig. 3).

During its work, the Technical Cell met with the Enlarged Group four times: at the beginning of the work, twice to inform the State about progress on the work and to have discussions with all of the participants, and a final time at the end of its work. At this last meeting, in October 1986, the members of the Technical Cell presented their conclusions and proposals. Their proposals were at that time validated.

#### *Phase 2: Designing of concrete actions with the beneficiaries and implementation*

The Technical Cell was then disbanded. The Prefect requested that the different services draw up a schedule of the concrete actions to be carried out over the coming years: foresters were to set up programmes for replanting both State and private forests; the DDAF was to work with them in preparing the financial plans; the DDAF was to draw up the planning of farming actions on the basis of subsidy requests presented by the farm technicians. The Fire and Rescue Service was in charge of preparing the program of Forest Fire Prevention Equipments in relationship with the ONF and the DDAF.

The technicians thus all worked directly with the local actors to whom they habitually provided their services: private foresters, farmers, locally elected officials, etc. The main actions undertaken by the technicians along with the works carried out by the local actors are summed up in Table 3.

#### *Present-day situation*

Implementing the overall plan is no longer the subject of any specific action: the local technicians consider they have done as much as possible under the conditions. A



Fig. 3. Rehabilitation proposals for the central sector of the maritime pine area. (Source: Technical Cell's report, Ales Subprefecture, 1986).

Table 3  
Main actions undertaken by the technicians and works carried out by the local actors

Technicians	Actions undertaken	Local actors	Works carried out (by who)
Private forest sector	Facilitating private forest owners regrouping <sup>a</sup>	6 forest owners associations: 60 owners (1500 private forest owners in the area)	Area: 250 ha reforested (Total private forest area burnt: 2000 ha)
	Elaboration of forestry projects		Reforestation and forestry improvement (owners or forestry works enterprise)
ONF	Replanting programme for their plots located in Zone 3 Renting out to farmers rangelands located in Zone 1	ONF	Area : 1000 ha replanted (ONF) 52 ha grazed (flocks of sheep)
Farm services	Facilitation and advice to farmers	30 farmers (150 farmers in the area)	Scrub clearing Setting up fences (Livestock farmers, enterprise)
ONF DDAF	Facilitating communes regrouping	Local communities 4 communes unions	Tracks Improvement and maintenance of the existing tracks (ONF—forestry works enterprise)

<sup>a</sup>To receive forestry credit packages, areas must cover at least 4 ha, thus making it necessary to group several owners in an association.

certain dynamic was locally apparent in a few small sectors of the hill massif, necessitating a high level of effort (both human and financial). The expected results of the operation in terms of preventing forest fires have remained, however, far from reached (see Fig. 4). According to an initial assessment of the vulnerability to fire of the burnt zone in 1986,<sup>3</sup> one must consider that the key zones of the rehabilitation plan (Zones 1 and 2: see Fig. 2) have the same plant cover conditions as the

zones for which no development was planned and that a good number of the sectors could not play their role of limiting fire propagation by reducing the amount of fuel material or even serve as a support zone in case of fire (Couix et al., 2000).

#### A framework for analysing concerted land-use management as collective project design processes

We propose to analyse concerted land-use management as collective processes in project design. That is to

<sup>3</sup>Carried out by M.C. Léouffre on the basis of two criteria: tree and shrub cover and stand height.

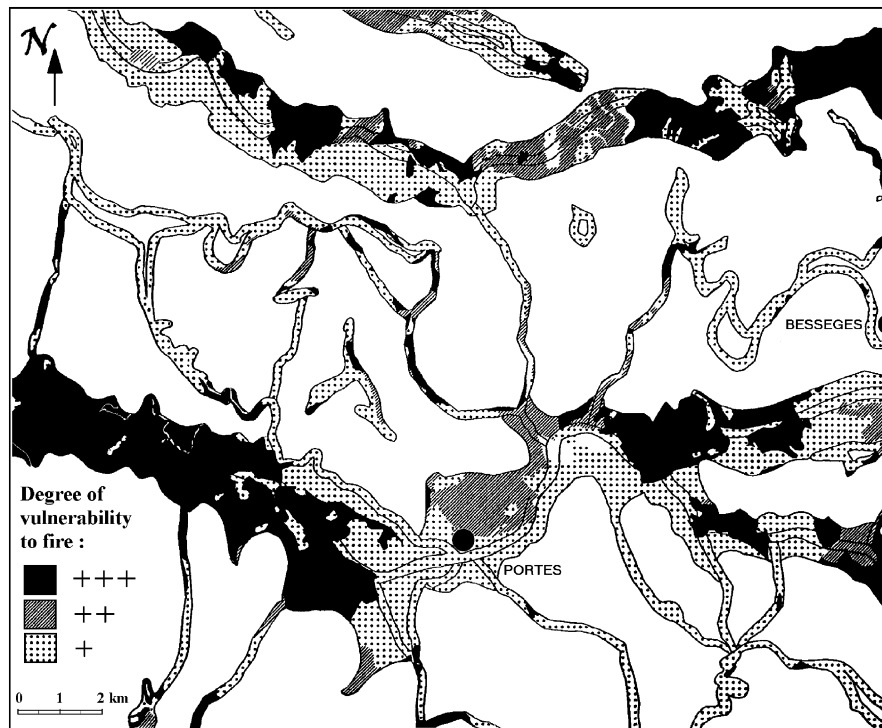


Fig. 4. First assessment of vulnerability to fire of Zones 1 and 2 in the Portes sector. Three degrees have been identified as a function of both tree and shrub storey cover and of the stand height: +++: trees > 75% or 50% < trees < 75% and 25% < shrubs or shrubs > 50% ++: 50% < trees 2–4 m < 75% and shrubs < 25% +: other cases. (Source: M.C. Léouffre, INRA Ecodéveloppement).

say, problems and their possible solutions will be approached as joint constructions defined by a group of actors working together. Such an interpretative framework leads to an analysis of the partners activities, and specifically the contents of their exchanges, from the vantage point of design tasks which were carried out (formulating problems, identifying solutions, validating solutions, etc.) and the objectives of such exchanges (knowledge sharing, justifying, discussing solutions, knowledge production, etc.). It thus becomes possible to distinguish between different forms of shared knowledge among the project partners during the running of the process.

#### *Land-use management considered as a design activity*

Research into the management of design activities (Midler, 1995, 1996; Hatchuel, 1996, 1999) as well as into the cognitive activities which take place during collective design (Darses and Falzon, 1996) recognize a number of characteristics inherent in activities of collective design. We consider these characteristics relevant to the task of characterising situations in which land-use management collective procedures are set up, at least as far as France is concerned. In particular, these are situations:

- *where formulation of the problem and development of solutions are handled together.* Even if initially the procedure addressed a need expressed by a group of actors, a point of dissatisfaction or even a catastrophe, the problem to be solved collectively is defined progressively as each of the potential paths of action are identified. This characteristic seems all the more important in the field of land-use management since, according to both technicians and written reports on experiences (CELAVAR, 1998; CEDAG, 1999; PRESAGE, 1995), projects are developed very progressively by carrying out concrete actions as examples (clearing undergrowth around the edges of towns, rebuilding stone walls, landscape maintenance, etc.) and simultaneously developing a more comprehensive approach to the problem being addressed.
- *where there is no perfect solution, but rather only acceptable solutions.* Several solutions can be envisaged to rehabilitate farm terraces. They can be used as vegetable gardens, as pasture for herding, or planted to orchards. They can also be treated chemically or mechanically, etc. Moreover, depending on locally imagined orientations, the initial goal of rehabilitating them can be reformulated along different lines which can vary, in an example like that of the Cevennes, from the installation of a livestock

farmer in the community to that of the creation of a training activity. It is usually “*the uniqueness of the situation,*” as Midler (1996) points out, which leads to following one path rather than another: owners willing to sell land in a commune, the presence of a landscape engineer, a teacher susceptible of training young people.

- *where different types of competence and different forms of logic are brought together.* This is the basic argument in favour of collective procedures in countryside management. (We will not be coming back to this point.)
- *where it is difficult to specify all of the necessary areas of competence, and hence all of the actors, at the outset.* For example, the commune which accepted the idea of setting up training activities had to progressively mobilise people in charge of training.

#### *Distinguishing co-design from distributed design*

In their work on the cognitive activities inherent to collective design processes, Darses and Falzon (1996) distinguish between two types of collective design activities according to the mode of involvement of the actors: co-design activities and shared design activities. Co-design activities correspond to situations in which the actors develop solutions together. They all share the same goal and contribute their specific competence so as to reach it, thus accepting heavy co-operative constraints to solve the problem. Distributed design activities correspond to situations in which design tasks are attribute to the various actors according, mainly, to their respective expertise. The individual actors then address the tasks as “sub-goals” so as to collectively solve the problem.

Moreover, according to the authors, “These two situations can be confronted during a single design process and can even be handled successively by a single actor.”

This distinction seems interesting to us in studying collective procedures in land-use management for two reasons.

First, it makes it possible to take into account the different periods or phases often found, at least in France, in land-use management operations while considering them to be part of a sole collective design process:

- periods during which intense collective work is carried out by the participating parties in groups, commissions or committees;
- phases of much more individual work by each party or of work done by the technicians with each of the beneficiaries or small groups of beneficiaries. This second step is seldom analysed in the literature as a

continuation of the concerted approach. In our opinion, it can generate distributed design activities.

Secondly, Darses and Falzon (1996) point out that during the running of the two types of collective design activities the modes of co-operation between the actors differ, particularly as far as the nature of the exchanges between them is concerned, as we will now see.

#### *Cognitive and operational synchronisation at the core of the concerted approach*

According to Darses and Falzon (1996), all collective activity is carried out through interaction between actors with two complementary goals: synchronising at the cognitive level and synchronising at the operational level. Cognitive synchronisation corresponds to communication processes aiming at establishing a “*context of mutual knowledge*” about the situation between the actors (information on the problem, envisaged solutions, hypotheses retained, etc.) as well as about the field of knowledge under question. Operational synchronisation aims at assuring task distribution among the actors and coordinating the schedule for carrying out the actions (sequence of actions, simultaneousness of certain actions, pace, etc.). The authors recognise that these two types of interaction characterise the modes of collaboration implemented in collective design activities quite well. According to them, activities of co-design rely essentially on cognitive synchronisation. The goal of exchanges between actors is to construct a shared representation of the situation or problem to handle, to explain proposed solutions, to justify or criticise choices so as to develop solutions together. Distributed design relies mainly on operational synchronisation. In this case, exchanges among the partners are based more on task distribution—where these are new this gave rise to actual negotiations among the actors—on the constraints and complementarities of the solutions each participant foresees and on continuing coordination overtime.

In the field of land-use management, it seems important to us to add a goal of spatial coordination to this notion of operational synchronisation: by its very nature, it is a question of *in fine* combinations of concrete interventions within a territory, with all the problems of contiguity, continuity and overlap that such combinations entail.

On the basis of this necessary adjustment of the operational synchronisation notion, we consider the overall set of interactions between the participating parties seeking either cognitive or operational synchronisation to be the general definition of the concerted approach within the framework of land-use management. Basing our work on this position will make it possible for us to characterise the procedure



implemented during the operation under question according to the nature of the exchanges between the partners and the modes of co-operation these exchanges rendered possible.

*Land-use management: a medium and long-term design process*

Design activities in land-use management extend well beyond the phase of defining the concrete actions which should be implemented. Indeed, the goals of land-use management (maintaining open spaces, landscape upkeep, conservation of an ecological inheritance) are medium and long term goals which can require regular adaptation of the initial project according to the changing context in which it is run. That is to say, the project and its concrete actions must be redesigned regularly to facilitate such periodic adaptation.

For example, forest fire prevention should be evaluated at the time scale of the forest exploitation cycle. In the Cevennes, the cycle lasts 40–100 years, depending on the type of trees. But, in general, plant cover changes due to the influence of ecological dynamics. From the moment one intervenes on the organisation of plant cover, the resulting structure begins to change. This change should be planned so as to keep the compartmentalisation of the cover intact, even though the plant formations themselves are being modified. It is not simply a question of organising the area according to a plant cover plan drawn up at a time  $t$  but rather of managing it over the medium and long term. Likewise, farming and forestry activities which can contribute satisfactorily to the partial control of this change, as far as fire prevention is concerned, also change with time: their ways of using plant resources are altered as farming projects develop, property owners or managers change, transformations appear in the social or economic contexts to which different actors must try to adapt their projects, and even under the effect of the functioning of the underlying production systems.

In terms of research approach, analysing concerted action procedures from the vantage point of the land-use management goals that were put in place to reach means taking an interest in the overall process. That is to say, both the development and the running of the project.

In studies on design activities in the industrial sector, an additional characteristic to those already presented is often put forward: the progressive irreversibility of such processes. That is to say, as the project moves forward, the specification governing it becomes increasingly rigid until a final solution is adopted. The design processes in the field of land-use management also display a certain degree of convergence: in the case of the Cevennes, the activities of the group of partners did, in fact, stabilise around a plan. However, if one hopes to maintain land-

use management through time, it is important to view such convergence as a solution susceptible of being redesigned to the point of reformulating the initial goals: “*The fundamental goals of the process must be re-examined periodically. A real and regular update guarantees their reaffirmation better than refusing all modification*” (CELAVAR et al., 1998, p. 35).

**Applying the approach to the analysis of the Col de Portes operation**

In this operation, the concerted approach concerned mainly the technical and administrative partners along with, to a lesser degree, the locally elected officials. Except for the ONF, manager of the State forests, the actors in the field, that is to say the managers of the rehabilitation area, became involved only insofar as designing the concrete actions for their own pieces of land. The farm and forestry technicians played the role of spokesmen for these actors. Today, the tendency would be to involve all of the potential actors concerned by the project more extensively. In terms of the analysis of a concerted process linking different actors, the project remains, however, relevant.

*Phase 1: Co-design of the land rehabilitation plan for the area*

Inside the Technical Cell the activities of the participants consisted in co-designing the land rehabilitation plan. This job was made possible by a cognitive synchronisation process which ran throughout the work.

Indeed, in different documents (letters, newspapers, and reports) we found the proposals for rehabilitating the sector made by several “future” members shortly after the fires. They are summarised in Table 4.

In general, for foresters it was a question of replanting and improving the protection of the hill massif by improving watching and fire-fighting. The organisation of the various activities as such was not put into question for the zone. Only a larger fire-break network based on farming and grazing was proposed. The farm services, for their part, sought to reorganise the activities throughout the hill massif so as to reintroduce farming activities that could help maintain open areas.

These proposals were drawn up before the actors began working together, and although certainly based on their individual interests, also involved their knowledge and logic. Starting from these different proposals and pieces of knowledge, the work carried out by the Technical Cell led to a sensible reformulation of the logic underlying the land-use management plan as a means of helping prevent forest fires. They moved, in fact, from speaking in terms of the struggle against the phenomenon to a formulation in terms of preventing the

Table 4  
Main proposals made after the fire

Partners concerned	Proposals
ONF	Reforestation of the burnt areas with high-timber value species where it is possible. Everywhere else, promoting natural regeneration Setting up watching committees included local population to improve the watching effectiveness in forest
Private forestry services	Land restructuring to improve forestry management; Planting high-timber value species; creating firebreak network based on farming and grazing (maintenance mode less expensive than mechanical or chemical treatments)
DDAF	Setting up landowners associations to improve forestry management; Setting up watching committees included local population; Maintaining fire-breaks by herd grazing
Farm services	Land restructuring to facilitate the land access for farmers; Rehabilitation of old farmlands and range-lands

conditions which fostered the development of the phenomenon. What is more, the resulting land rehabilitation proposals were quite innovative compared to the plans previously implemented (networks of tracks, cisterns, water reserves) which sought only to allow fire to be fought efficiently.

We thus analysed the different activities of the Technical Cell in terms of the design tasks they carried out collectively as well as from the vantage point of knowledge shared and produced during the activities. This analysis is presented in Table 5.

The analysis shows that inside the Technical Cell the partners worked collectively and in conjunction in carrying out the tasks of developing a shared representation of the situation, of the description of the problem to solve and of solutions to the problem (in terms of both content and means to implement). That is to say, they co-designed the land rehabilitation plan. To do so, they had to both share knowledge and work together in producing knowledge about the situation as well as about the general field relating to fire prevention (potential modes of developing the area, fire behaviour, criteria for structuring the vegetation cover, etc.). According to their President, the Technical Cell's work procedures aimed to construct this "*context of mutual knowledge*" (Darses and Falzon, 1996) and then of maintaining it. Different methods were used to favour knowledge sharing: field visits to the area, indoor discussions about the various proposals drawn up, discussions about concrete examples. Analysis of the

minutes of such meetings shows that all of the participants had the opportunity to explain or criticise the proposals. Meetings were numerous and "dense": 14 days of meetings in 6 months which, according to the presently active technicians and in comparison with other projects we know of (3 days of meetings over 18 months, for example, for the design of a land-use management plan for an alpine valley), represents a major investment in time. Finally, according to the President of the Technical Cell, one important point which had a favourable impact on maintaining a shared context was the fact that the representatives from the institutions were permanent participants.

*Phase 2: Distributed design of the actions to implement and a low level of operational coordination*

At the end of the Technical Cell's work the researchers had already left. The design activities of the different technical and administrative partners continued in a more 'distributed' manner, in the Darses and Falzon sense of the word. On the one hand, according to the minutes of the final meeting of the Enlarged Group, the land rehabilitation plan was officially recognised as a goal to reach, taking into account the concrete realities of the zone, in rehabilitating the devastated area and the entire hill area. It thus took on the importance of a "*master plan*", in the terms of the technicians. On the other hand, there was an explicit distribution of tasks by the Prefect to the different services according to the administrative expertise of the participants. They were to work with the beneficiaries of the operation (farmers, forest owners, local communities) in developing and implementing concrete actions on the basis of the land rehabilitation plan.

According to our interviews with certain technicians from the Technical Cell and on the basis of statements made by the technicians who replaced them, it appears that there was little coordination between the different partners to follow up their design work. For example, there were no more meetings between technicians intervening in the field to discuss their tasks and progress, to speak of the constraints generated by one another's actions, to identify potential complementarities in silvicultural actions and farming projects, or to draw up a schedule of operations, etc. Each of them simply prepared separate projects with their usual contacts. It is thus, for example, that in the Aujac commune forest replanting encircles the sheepfold and the sheep farmer's few small plots of land around it. Since no fencing was included in the reforestation plan, the sheep regularly cross the replanted sections, causing considerable damage. Likewise, to reach his pastures, the shepherd is forced to cross the reforested areas. At present the situation has degenerated into constant

Table 5  
Analysis of the co-design phase of the land rehabilitation plan

Date	Partners concerned	Activities	Design tasks carried out	Aims of the exchanges between partners
January 1986	Technical Cell	Exchanges between the different members on forest fire problem perception and on work orientation	Formulating problem	“Tabling” and sharing knowledge about the situation (problem data)
February–March 1986	Technical Cell + forester specialised in fire prevention	Fields tours organised on the initiative of each of the partners	Identifying different tracks of solution	Justifying solutions of each partner; Sharing knowledge about potential modes of land improvement;
	<i>Field tour organised by the farm technician</i>	<i>Ex: Visit to a farm switched to sylvo-pastoralism</i>	<i>Track: flock grazing as a mean of maintaining open zones</i>	<i>The technician was able to show the necessity of pastures for the herd feeding in addition to rangelands</i>
	<i>Organised by the technician from the private forestry sector</i>	Meeting with private forest owners	Elaborating shared representation of the situation	Justifying constraints identified by each participant sharing knowledge about the situation <i>The technician raises the problem of land fragmentation</i>
	<i>Organised by the agricultural advisor</i>	Meeting with livestock farmers interested in land restructuring		<i>The advisor raises the problem of the access to land for the livestock farmers</i>
	<i>Organised by Technical Cell</i>	Meetings with forest loggers and with different actors from sectors of agricultural production.		Knowledge co-production about the situation
April 1986	Technical Cell + forestry ‘expert’ + fire-fighter	Historical analysis of fires	Re-formulating problem: The great vulnerability of the area is linked to development of uniform vegetation cover on large areas. These zones are particularly sensitive to the development of major fires.	Knowledge production about fire behaviour in the sector
			Identifying solution track: produce a structuring of the vegetation cover with the forestry and agricultural activities	Sharing reformulation of the problem to solve Formulation of a shared goal to keep design work
	Subgroup included the farm service technicians	Drawing up of simulation models of the techno-economic functioning of farm	Elaborating a validation method of the proposals from the vantage point of farms	Co-production of knowledge by farm technicians about techno-economic functioning of farm and validation methods
	Technical Cell + forestry ‘expert’ + fire-fighter	Identifying criteria of spatial zoning (definition of Zones	Elaborating procedure to solve the problem of plant cover structuring	Justifying solution and knowledge co-production about problem solving procedure

Table 5 (continued)

Date	Partners concerned	Activities	Design tasks carried out	Aims of the exchanges between partners
		1,2,3)		
May 1986	Subgroup included forestry technicians, the forestry 'expert' and the fire-fighter	Drawing up of a map of the fire risk zones	Applying problem solving procedure to the field data ↑ Sharing reasoning steps according to technicians skills ↓	Knowledge co-production about vegetation cover structuring less sensitive to forest fires
	Farm service technicians subgroup	Idem April 86	Idem April 86	Idem April 86
June 1986	Technical Cell	Field tours with the zoning proposals	Assessment of the solution to produce a vegetation cover structuring	Justifying and validating solution Maintaining a "context of mutual knowledge"
Summer 1986	Technical Cell	Elaboration of proposals for the concrete actions implementation (land restructuring, programming of investments, collective structure to coordinate the set of actions)	Elaborating tools for the concrete implementation of solution	
	Technical Cell	Concrete proposals for the central sector of the land rehabilitation plan	Applying the overall solution to a concrete case ; validation of the different steps of reasoning	Discussion of the different steps of reasoning and their articulations
October 1986	Technical Cell			Elaborating collective justification of overall proposals

conflict. At the site, the forest technician developed a project with four forest owners without taking into account the presence of the shepherd using the plots next to theirs. The shepherd in turn brought in the farm technician in hopes of having the forester's project revised according to his own interests. The farm technician intervened, however, too late and could not succeed in renegotiating a project review.

Given the highly "integrated" character of the land rehabilitation plan, one can but wonder about how the members of the Technical Cell thought the individual farm and forestry projects would be articulated through time and space. To assure the overall logic of the total project, the Technical Cell did, in fact, identify different types of coordination for the concrete actions.

- The plan was to guide the various partners in preparing the projects with the beneficiaries. Depending on the zone in which the mobilised or potentially mobilised plots were located, the plan contains

indications as to the role the specific plots were to play in terms of fire prevention and, in consequence, as to the general types of projects to implement. It also specifies that to permit the articulation of the different concrete actions, the partners were to think in terms of small geographical entities within which all activities could be taken into account simultaneously.

- As far as scheduling of the global investments was concerned, according to the Technical Cell, it was "imperative to keep in mind the logic of the [overall] project and, hence, the coordination of the basic operations." In other words, the annual sharing of mobilised credits to finance operations was to be considered globally so as to avoid contradictions in the required coordination of certain concrete operations (for example, financing actions linked with opening certain wooded plots, year  $n$  while financing the herds which were to assure the maintenance of the same plots through grazing only by year  $n + 2$ ).

- It was planned that the beneficiaries would first be grouped around operational goals (forest management, mobilising land for sheep farming, organising the pasturing of herds, etc.) to work with them in preparing the concrete actions to be implemented. Then, a structure grouping of all the participating parties of the hill massif (private beneficiaries, the ONF, local communities) was to be created to facilitate coordination of the set of actions undertaken (investments, maintenance, facilitation, etc.).

These approaches to coordinating the concrete actions were, in fact, only partially implemented. What is more, they did not make it possible to coordinate the design activities of the different actors.

- The Technical Cell had specifically stated that to follow up the design work it was necessary to think in terms of small geographical entities, not in activities. However, the common work procedures that such an approach requires were not defined: who was to define these entities?; on any one entity, how can you be sure that neighbouring projects will not lead to specific constraints? etc.
- In fact, the plan rendered only partial coordination of the projects possible: according to the services, only limited use was made of it to orientate their preparation. The farm projects were designed with reference to the plan, sometimes even at the cost of existing systems of production: “*it was sometimes necessary to twist the farmer’s project out of shape,*” according to one of the technicians. The ONF agents also respected the zoning. Still, they did not articulate their projects with those of the other actors. They ceded their Zone 1 plots, which could no longer be replanted in trees, to the grazing of herds. They also drew up the replanting programme for their plots located in Zone 3 (the majority), that is to say, in the zone where no specific rehabilitation was planned. Now, Zone 1 is the ridge zone, where grass resources are scarce and therefore insufficient for feeding flocks all year long. Using these areas would often have meant providing the flocks with other plots to assure enough coherent feeding for a farmer to move in or for an existing farm to develop. This situation was not foreseen by the ONF: it is for this reason that we say that they did not take measures to coordinate their actions with those of the livestock producers. For the technicians in the private forests, the plan quickly proved too theoretical. Until then the number of projects for the private foresters was quite limited. They therefore had to invest a lot of effort in mobilising the owners and did not “*want to discourage the forest owners with individual projects by presenting them a plan which they themselves found too theoretical.*”
- A technical land-use management commission, which had existed before the operation began, was supposed to discuss the overall annual programme of the actions included in the implementations laid out in the plan. This commission was composed of farm technicians, professional managers, a representative from the DDAF and a representative from departmental authorities. Until then, they had treated the farmers’ subsidy requests concerning forestry credits for works aimed at defending the forest against fires. For the Col de Portes operation, different credit lines could be mobilised, each having its particular programming logic. The farm files were, hence, treated by the technical commission. However, the programming of forestry investments followed its normal route, which did not include being dealt with by the commission. The same was true for forest fire prevention equipment. The commission could not, therefore, play any type of coordinating role. Finally, according to the technicians, credits made available each year had to be used up very quickly for reasons inherent to the mechanics of such sources of financing.<sup>4</sup> This situation did not leave enough time for discussion and the maturing of projects (Couix et al., 2000). However, reasoning in terms of annual general programming of the general investments did not presuppose any preparation of basic coordination operations. It was simply a case of a posteriori respect of existing coordination. What is more, for such a proposal to become operational, it would have been necessary to redefine the programming modalities for each source of financing (which was not at all within the scope of expertise of the partners) or even to identify, beyond the confines of a structure, a true coordination procedure of these various lines of financing.
- Finally, as we saw each time it was necessary to implement an action, the technicians favoured groups of beneficiaries: groups of forest owners, groups of communes. Setting up a collective structure to coordinate the overall set of planned actions was not part of the clearly defined competence of any administrative or technical entity. It was much more simply a case of facilitating the project overall. None of the partners had really been put in charge of such a task neither following internal negotiations between the members of the Technical Cell nor by the Prefect.

During the final meetings of the Technical Cell, the question of maintaining a collective coordination structure between the partners to follow up the operation was explicitly put forward. Even though some of the participants proposed such an approach, others

<sup>4</sup>For example, forestry credits arriving in year  $n$  must be committed in year  $n$  and the corresponding works must start by  $n+2$ .

were against it. Local institutions, jealous of their own prerogatives, finally decided against the proposal, even though they felt that the defined goals and coordination modalities for the concrete actions were sufficient to complete the running of the overall project. The analysis we have just presented, however, shows that even if this second phase of the land rehabilitation operation of the maritime pine massif corresponded quite well to a distributed design phase in the Darses and Falzon sense, it was still characterised by a practically total lack of operational synchronisation between the partners involved. In our opinion, this lack at least partly explains the relative failure of this operation, as we will now explain.

## Discussion

As we have seen, at least from the vantage point of forest fire prevention, the operation for the land rehabilitation and management of the Cevenol maritime pine massif did not yield the expected results. Several factors should be taken into account when interpreting these results: the low numbers of farmers and livestock farmers, the number of absent owners, financing which is hardly compatible with the realities of the terrain (size of plots, available tree types, etc.), the low stakes as perceived by the actors due to the low potential of the forest, lack of local political initiative, etc. In addition to these contextual elements of the action which we have already examined (Collective, 2000; Couix et al., 2000), our analysis of the concerted approach arising during this operation teaches us several new points.

### *Emergence of new tasks*

In 1986, the work of the Technical Cell represented a true innovation as far as both the procedure adopted and technical contents of the proposals are concerned. Before this date, it would have been unimaginable to sit representatives from the forestry services, farm services and the hunting lobby at the same table due to the residual conflict inherent in their relationships. As our analysis has shown, the work of the Technical Cell made it possible to promote cognitive synchronisation between the technical and administrative partners of the project. This cognitive synchronisation, in turn, facilitated their task of collectively drawing up the land rehabilitation plan along with potential types of exploitation of the area susceptible of contributing to its concrete implementation.

Still, following the disbanding of the Technical Cell, the procedure was characterised by a very low level of operational synchronisation between the technicians and a fortiori between the actors in the field. Now, throughout the process, whether it be during the work of

the Technical Cell or after the task distribution prepared by the Prefect, the technicians hardly touched the questions concerning the means to put into place, other than technical, to assure the success of the land rehabilitation plan. In particular, there was no collective treatment of the modes of operational synchronisation to implement in continuing design work with the potential beneficiaries. Due to the general logic of the project, coordination modalities for the concrete actions had been proposed. But, as we have seen, they were not concerned with the actual procedural dimension of coordination, that is to say the procedures to put in place between the various actors to assure the compatibility and coherence of the projects they were working on. Everyone simply went back to their own way of working, by and large. According to Darses and Falzon (1996), in the distributed design stage, the attribution and running of tasks requires far greater discussion and coordination when the tasks are new. In the present case, the various technical and administrative partners were, in fact, facing new tasks which did not enter explicitly into their normal spheres of competence: facilitating the global project, drawing up sylvopastoral projects linking forest owners and livestock farmers, setting up transversal facilitation structures, coordinating the different lines of State credit, etc. In short, the most transversal tasks, as distinguished from the more “classical” technician tasks, came into being due to the integrated character of the plan. In our opinion, above and beyond a discussion about task allocation, it appears necessary to reflect on innovative modes of land-use management and simultaneously on the running of new transversal tasks. This second aspect implies cognitive synchronisation as much as technical aspects.

This might require redefining the competences and the skills inside the institutions. It might also be necessary to identify new types of competence. Several authors, for example, now agree about the need of assuring an animation or assistance function in the field to favour the building of relationships between the individual interests and projects of the actors (farmers, foresters, hunters, locally elected officials, etc.) and to make it possible to identify shared goals and to draw up concrete action plans (Huijsman, 1994; Campbell, 1994, 1998; Röling, 1998; Laban, 1994; King, 2000; Couix, 1993, 1997). Still, as Huijsman pointed out, “*outside agents who come to facilitate such social processes must prove they possess the appropriate expertise and that they have the right professional experience.*” For Campbell (1994, 1998) for example, they must be able to listen, to question, to analyse, to favour synergies and manage conflicts while knowing how to lead the group, to step back, or even to provoke. For this reason, experience in group facilitation is at least as important as a qualification in any specific field, including that of renewable resource management. We

ourselves had the opportunity of showing that possessing particular technical expertise (in silviculture or agronomy, for example) could be a handicap in animating a heterogeneous group since the agent handling the facilitation tends to focus more on technical expertise than on the transversal function he is intended to assume (Couix, 1993).

### *Learning to work together*

More generally speaking, the study of this case, which is in fact somewhat of a “caricature” of the concerted action “aborted in the process”, leads us to underline how important it is for the participating parties (both technicians and actors in the field) to learn to work together and, particularly, to master the types of coordination such work involves. Analysis of phase 1 shows that during the co-design activities the partners were able to synchronise at the cognitive level. They were brought to share knowledge of the situation, to share knowledge of the field of land-use management so as to develop a shared image, to reformulate the problem and design solutions. This cognitive synchronisation was, however, insufficient: they did not share their knowledge to “act” together. In other words, they did not exchange their points of view about modes of intervention so as to follow up, in the field, “common” efforts. Later on, all exchange between the technicians was stopped, thus putting an end to shared knowledge. Nor was there any remaining gathering point to favour such exchange.

The reflection initially developed by Röling (1993, 1998) around “*platforms for agricultural resource use negotiation*” had at its core the process of social learning at play in the negotiated or concerted management of renewable resources. Such an approach constructs a framework of negotiation and collective learning in which the different actors treat the goals of renewable resource management and the concrete interventions in the field which will make it possible to reach them. The question of the common modes of action and notably of the coordination which these innovations could be expected to involve is approached from the vantage point of the resource management institutional context and the framework to set up to favour such negotiation. We would here like to emphasise the need for the participating parties to learn to work together within these frameworks where they exist, to coordinate themselves and to translate this coordination into their normal activities. This dimension of collective learning is clearly recognised in the preceding approach but in our opinion it often remains too implicit. We would suggest that the framework facilitate forms of collective learning a priori as it is the reflecting of the group on its own functioning which will favour learning about the framework itself. Now, this positioning with respect to

the functioning of the proposed frameworks appears to be more closely linked to the researchers who devised it than to the actors who were involved. In other words, it seems important to us that during concerted approaches in land-use management, especially where they are new, part of the interaction between the participating parties be dedicated to the procedure itself and its implications in terms of modes of co-operation as the project moves from phase to phase. This point seems all the more important to us when the procedures foresee phases of individual work.

### *Relevance and limits of the analytical framework*

As we have said, approaching concerted action in land-use management from the vantage point of collective design processes seems well adapted to us insofar as the general characteristics of collective design activities describe such situations quite well. Particularly, the co-design and distributed design concepts made it possible for us to propose a reading of the concerted approach covering both the phases of work in which the partners sat at the same table to draw up goals, discuss solutions and negotiate compromises and those in which the overall dimension of the project sometimes appeared more diffused and work more individualised, even if it was supposed to be aimed at a common goal. The notions of cognitive and operational synchronisation made it possible to examine the procedure underlying the land rehabilitation operation from the vantage point of the exchanges between partners and the goals of such exchanges. This examination led us to identify different types of knowledge which the partners should share: knowledge relative to the situation, to the field in which the initial problem was posed and to the common work procedures which could facilitate reaching the identified goals.

This analysis does not, however, take into account or account for the context, notably social and political, in which the concerted approach was run. Certain authors have pointed out the need of analysing such contexts in order to understand the concerted or participatory procedures which appear and to identify the most well adapted practices. Campbell thus explains that the Australian “*Landcare movement*” cannot be replicated elsewhere without taking into account typically Australian characteristics such as “*general farmer acceptance of the need for change and the [need] to work together, [of] relatively autonomous farmers with low expectations of financial support from the State, a stable political climate, low population pressure, a relatively homogeneous culture.*” Albaladejo and Veiga (1997) show that in Brazilian Amazonia implementing concerted approach would be practically utopian and that

no collective project would be comprehensible without a sociological analysis of all of Brazil.

Our approach does not make it possible to address such aspects. It seeks to fulfil a complementary role insofar as it explores the modes of co-operation rendered possible by the exchanges between actors with precise goals of collective design. It does not, however, ignore them completely. For example, Albaladejo (2000) points out that participative approach does not always show itself as the ad hoc procedure for drawing up projects. In particular, it is not always relevant to contexts in which part of the actors “to involve” have no experience in taking part in collective decision-making processes or even of simply expressing a point of view about matters of collective interest. One of the main results of our analysis is the importance of favouring the learning of the modalities of working together among the participating parties. In our opinion, one of the answers to the need of taking the social and political context into account in the implementation of the procedures lies in this capacity to place the actors in a situation where they will learn about their own way of functioning collectively.

## Conclusion

In this article we have shown the interest of analysing concerted approaches in land-use management as design processes running through time. This analysis has, in fact, made it possible for us to display different forms of knowledge which should be shared during such processes. In particular, we have seen how the lack of sharing the knowledge to “act” together can be prejudicial to the whole process. Now that the role of such learning has been brought to light, research must continue to specify, according to the social and political context, the framework which favour such learning.

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