

Landscape evolution of southern Causses:

Perceptions of inhabitants and socioprofessional stakeholders



Causses méridionaux landscape (J. Huguenin, 2009)

Study carried out from the 5th to 17th of October 2009

http://sociology-agroforestry.cirad.fr/index.php/sociology_agroforestry_fr

Directed by : Nicole Sibelet, Madeleine Mutel, Michel Dulcire, Régis Peltier.

Contributors :

Cindy Adolphe, David Nicholas Barton, Stéphanie Carrière, Youssouf Cissé, Pierre Clinquart, Charles Galabuzi, Ibrahima Diop Gaye, Mohana Gudde Seetarama.Rao Sylvie Guillerme, Johann Huguenin, David Langat, Louise Meylan, Mathilde Montzieux, Sabine Nguyen Ba, Oumarou Palou Madi, Volatiana Minah Rafalimaro Randriamialisoa, Bruno Rapidel, Guillaume Rousseau, Mahamoudou Said, John Tabuti, Lucie Temgoua, Cristobal Villanueva.

March 2010

ACKNOWLEDGEMENT

First of all, we would like to thank interviewed people for welcoming us and for their patience in answering our questions as well as people who attend to our feedback session and participate actively in the debate on the 16th of October 2009.

We also thank the CPIE to collaborate and Hotel du Rocher which put at our disposal a working room for the group.

Our entire acknowledgement to the sponsors: Agropolis Foundation and CIRAD.

We finally thank the whole pedagogic team for the coordination of the thematic school and Sabine Nguyen Ba and Mathile Montzieux who finalized this report.

SUMMARY

This study has been led during a Thematic School: «Formation to human sciences methods applied to agroforestry» which took place from 5th to 17th of October 2009 in two sessions: 6 days in Montpellier and 6 days on the field. An international and multidisciplinary team conducted a study on inhabitants and socio professional stakeholders' perception of the evolution of the southern Causses landscape. This landscape is a specific French heritage, supporting the identity support of a part of its inhabitants, and whose preservation is at stake. However, directly linked with agrarian history, the processes are currently changing the landscape, in particular, the function of the rangeland. The landscape is closing, colonized by bushy and tree vegetation; rangelands are fenced; pine plantations appear here and there. Faced with this evolution negatively judge by most of the stakeholders interviewed, their reaction varies according to their profession, social commitment, or their professional aspirations.

So, the people of Causses see the future of “agropastoralism” according to the 5 following perspectives: (i) landscape preservation and management, (ii) improving income and attracting young farmers, (iii) new market opportunities for specialized projects in the region, (iv) the promotion of tourism in the region, (v) the coordination of various stakeholders efforts such as farmers, elected members, government officials, hunters, CPIE and ONF.

Key Words: *southern Causses, agro-pastoralism, perception, semi-structured interview, typology*

ACRONYMS AND ABBREVIATIONS

CE: European Community

CIRAD: International research centre of agronomy for the development

CPIE: Permanent Centre of Initiatives for the Environment

DIREN: REgional DIrection for ENvironment

IAMM: Mediterranean agronomic institute in Montpellier

MAE: Agro-environmental Measures

MIA: Innovates Methods of Agroforestry

ONF: National Office of Forest

PAC: Communal Agricultural Politic

PMTVA: Dairy Cows Primes

Projet LIFE: Financial Instrument for Environment

TERMINOLOGY

Semi-structured interview :

« Interview in which there are guidelines for the interview, but the order to express the themes is free and is not strictly closed previously. »

(Dictionnaire de sciences économiques & sociales, 2006)

Typology :

« Model of representation (table, graphic...) of the farms diversity of a local and regional agriculture, distinguishing farms types based on structural, functional and performance criteria. These typologies are tools used to study agrarian systems. It can be based on farms' organisation, projects and the situation of farmers.

(Laurence de Bonneval, 1993)

SUMMARY

ACKNOWLEDGEMENT	1
SUMMARY	2
ACRONYMS AND ABBREVIATIONS	3
LIST OF TABLE	4
LIST OF FIGURES.....	4
INTRODUCTION.....	5
1. FIRST PART: Problem statement and method.....	6
1.1. Evolution of landscape perceived by the inhabitants and stakeholders of Causes ...	6
1.2. Interview of inhabitants and stakeholders of Causes.....	7
2. SECOND PART: Results.....	9
2.1. Four types of actors	9
2.2. Values attributed to landscape by inhabitants of Causes.....	10
2.3. Evolution process of the landscape of Causes	13
2.4. Role of stakeholders on rangeland evolution	16
2.5. Stakeholders strategies face to the landscape evolution.....	17
a. Strategy 1: Clearing.....	17
b. Strategy 2: Intensification	18
c. Strategy 3: Extensification	19
d. Strategy 4: Diversification	19
e. Strategy 5: Energizing the local economy.....	19
CONCLUSION	20
BIBLIOGRAPHY	22
3. APPENDIX.....	24

LIST OF TABLE

Table 1 : Sample of interviewed people.....	8
Table 2: Functions of the actors in 3 processes of landscape evolution	17

LIST OF FIGURES

Figure 1 : Chronology of the landscape evolution in the region based on the identified processes.....	14
Figure 2: Importance of processes of landscape evolution according to the types of actor.....	16

INTRODUCTION

Context of the report

This study has been conducted during a Thematic School: «Formation to the human sciences methods applied to agroforestry» which took place from 5th to 17th of October 2009 in two sessions: 6 days in Montpellier and 6 days on the field (Le Caylar) (**Cf. Annexe 2: press release**).

In the context of a training on Innovate Methods for Agroforestry (MIA) financed by Agropolis Foundation and the international research centre of agronomy for the development (CIRAD), an international (India, Cameroun, Senegal, Costa Rica, Guatemala, Uganda, Kenya) and multidisciplinary team (sociologist, geographer, agronomist, forester...) of 22 participants (**Cf. Annexe 1 : list of participants**) coordinated by 4 tutors (Nicole Sibelet, Madeleine Mutel, Michel Dulcire and Régis Peltier) conducted a study on inhabitants and socio professional stakeholders perception of the Meridional Causes landscape evolution ordered by the Permanent Centre of Initiative for Environment (CPIE) of Meridional Causes.

The area of study

The study has been conducted on three areas in the Causes:

- Causes of Larzac in the department of Hérault,

And in the department of Gard:

- Causes of Blandas and Luc
- Causes of Campestre

Several types of activities are practiced on this area: farming, forestry, tourism, wilderness, and hunting. The traditional economic activity is agriculture. Tourism is developed (approximately 2,500 dwellings, half of which are secondary residences). The other activities (crafts, business, economical project in urbanized area...) are less developed and come within the scope of fixing or even increasing the resident population to maintain the socio-economical net (school, business, services...).

Agricultural activity has been changing since 1960 and is characterized by a predominance of livestock breeding; since 1980 especially:

- A decreasing percentage of the areas managed with dairy ovine system, mix dairy ovine system, goat cheese and other diversified systems.
- An increase of 22% of the areas managed by cattle meat, ovine meat and equine : accompanied by an increase of the cattle livestock for meat
- A closing landscape by trees on rangeland which occupy 88 % of the agricultural areas.

The population of Causes of Larzac was 1021 inhabitants in 1999, with an increasing trend (+13% between 1956 and 1999), whereas in Causes of Campestre, Luc and Blandas, the trend is decreasing over the same period.

Terms of references of CPIE

The Southern Causses CPIE is composed of elected officials, agriculture and forestry socio-professionals, and associations working in the fields of nature conservation, hunting, and environmental education. The association has been carrying out management and environmental education activities and programs in the Southern Causses region since 1994. As a consultative body with the mandate of sustainable management of landscape resources in the Meridional Causses, it is involved in the management activities often linked with administration and execution of incentive programs (e.g. provision of financial incentives mechanisms, Natura 2000, agri-environmental measures). These must be implemented extremely rapidly at times. Valérie Bousquel, the director, hopes to gain a better perspective through the study of what local inhabitants and stakeholders think about the following points:

- The word, “agropastoralism”. What meaning is given to this word commonly used by technical experts? Is the concept of sylvopastoralism spontaneously included within this word?
- The role and function of rangeland (grass resource, land capital, landscape unit...?).
- The future of agropastoralism on the Southern Causses territory.

The result of the study would facilitate reflection on information and outreach activities as well as on the planning, if necessary, of additional management activities.

This order is the starting point of our study. To meet this order, we have developed some research question, with key concepts identified in the literature relating to Causses and its agrarian history.

1. FIRST PART: Problem statement and method

1.1. Evolution of landscape perceived by the inhabitants and stakeholders of Causses

Stakes and challenges, read before the field work

The decreasing numbers of farmers and labour force in agriculture, the evolution of breeding and agropastoralism practices, and the difficulties to conciliate two orientations – to increase the agricultural productivity preserving the environment - are mentioned.

The main challenges are to: maintain human activities existing on the territory, to create new activities and put into action strategy limiting the landscape closure of meridional Causses.

In this context, CPIE appears as the main institutional actor to manage the territory and the local development. Perceptions of local actors are important to collect to define its orientations and future strategies of action.

Key concepts used

Three groups of key relevant concepts out of the reviewed literature are emphasised:

1. Agrarian transition, multifunctionality of agriculture and the rural space, agropastoralism, agroforestry;
2. Stakeholders strategies, local knowledge, perception, identity;
3. Territory, territory management, environmental services, sustainability, and landscape politics.

Research questions and hypotheses

From the CPIE order, several research questions and hypotheses have been established:

What are the processes of change of the Meridional Causses landscape, as it is perceived by local stakeholders and inhabitants?

Secondary questions about the landscape

- What are their practices relating to the processes of change observed by stakeholders?
- What are their strategies and the means mobilized?
- What are the values applied to the landscape, to agriculture?

Variables taken into account

Different variables at individual and regional level were selected. Certain variables are about individual profile of interviewed person (name, age, native or non native of the region, members of an association...).

Some at individual level were about the diversity of professional activities, available resources to agricultural activity, their practices, values associated to the landscape and to agriculture, problems and individual projects.

Others at regional level were about economic activities and their relation in the regional integration to the area, the agrarian system and their dynamics of evolution.

1.2 Interview of inhabitants and stakeholders of Causses

Choice of the person to interview

The objective of our sample was to interview the most diversified persons. So we have used the information available from CPIE. Stakeholders identified to be concerned by our study are: cattle breeder and sheep (meat and milk), farmers, hunters, cellar owners of Roquefort cheese, elected people, DIREN, associations of nature preservation, the Institute of 'livestock, people (from the territory or new migrants; with an activity inside or outside the area), people

residing outside the Causses but who work on the territory, tourists, professionals of tourism, and CPIE.

Thirty three persons with different kind of responsibility and belonging to different socio professional categories were interviewed (table 1), in particular farmers, local elected people, official of associations. Some persons belong to several categories. For example, some farmers are also mayors. That's why, instead of 33 persons, 39 persons are listed in the total number of interviewed person.

Table 1 : Sample of interviewed people

Categories of interviewed persons	Nb of pers possible	Nb of Interviewed person	Rate of the survey (%)
Farmers among with shepherds and breeders	91	20	22
Elected people	16	7	44
Technicians	10	4	40
Association and socio Professional	9	8	67
Total	126	39	

Tool of the interview: the semi-structured interview (Cf. Annexe 3: interview guideline)

Within our team, we formed 5 groups of 4 to 5 persons (**Cf. Annexe 4: distribution of the group of participants**). Each working group was accompanied by a tutor to go to the appointment with the stakeholders of the Causses.

During our field work, we have one individual semi-structured interview. In the questions, we approached general theme by open questions in order to avoid guiding the answer. Our speech was limited to facilitate the discussion, adopting a comprehensive posture, basing further questions on the answers already expressed.

The general topic were :

- a) The history of their settlement in the Causses,
- b) Their activities,
- c) The changes perceived at a landscape level,
- d) Their problems
- e) Their projects.

We made written notes of all the interviews. Some of them were filmed by the research team of CIRAD doing an audio-visual training tutored by an IAMM person.

Because of the Anglophone participants, some interviews took place in French and were translated simultaneously in English.

Observations

Direct observations are complementary sources of qualitative information to the interview.

Counting and analysis of data

Information stemming from notes were typed on an Excel file in order to link them up.

The participants worked on all the information by thematic groups classified in an Excel file. Each thematic group was composed of people from each group interview. So all the information collected was taken into account in each thematic group.

The thematic group worked on the following topics:

- 1) Identification of the processes of landscape evolution in the Causses (causes and effects on the landscape)
- 2) Stakeholders and links between actors related in the interviews, when the interviewed person mention and explain an evolution process.
- 3) Strategies of the interviewed people, to respond to the evolution observed on the Causses
- 4) Values explicit or implicit expressed in the interviews, in particular about landscape, agriculture, the evolution of Causses.

We collectively worked out a typology of the stakeholders interviewed.

This task let us characterize types of stakeholders by their point of view (perception, values, and strategies) and their connection to the landscape evolution of Causses. The results of the thematic groups (processes, stakeholders, strategies and value) have been crossed with the typology of the stakeholders.

The feedback

The feedback took place in the communal room of Caylar le 16th of October 2009 and took place like this:

- Presentation : 30 min.
- Debate: 1h
- Apéritif and free discussion: 1h

In total, 24 persons came for the presentation of the results and participated in the debate.

This meeting was a means to validate or invalidate the results and collect further information through a debate.

2. SECOND PART: Results

2.1 Four types of actors

Our typology is based on characteristics of interviewed persons (profession, participation to social life...) and on data answered during the interviews.

Four groups have been identified according to their perception of the current processes which are changing the landscape of Causses.

Type 1: Extensive ovine meat breeder.

It's the only group characterized by its farming system. Ovine meat breeders express a strong sensitivity regarding the beauty of the landscape of Causses. They see a closing landscape of the grassland, considering it negative. However, they consider they have « good practices » to fight against this evolution: pastoralism or sylvo-pastoralism (they don't use the word). People of this group generally belong to a strong social network, and express their negative opinion on current agricultural politics.

Type 2: Stakeholders worried about the evolution of their landscape.

This group is heterogeneous; these people have in common the expression of the necessity to manage the landscape. They hope to control and modify an evolution they judge to be negative, but they have different objectives. Environmental politics are generally positively considered.

Type 2.1: Would like to use the landscape for the development of tourism.

Type 2.2: Would like to use the landscape for others economic activities.

Type 2.3: Would like to express a romantic/ ideological point of view.

Type 3: Farmers whose first objective is to improve their livelihoods.

This group expresses an attachment to their landscape of Causses, but they are first of all looking to improve their livelihoods, even if their practices are contributing to the « negative » evolution of the landscape.

Type 4: People whose preoccupation of commercial and industrial development of the territory is a priority compare to the evolution of the landscape of Causses.

2.2 Values attributed to landscape by inhabitants of Causses

Several dimensions contribute to their judgement: Economical, ecological, social (solidarity, neighbourhood), ethic (justice), aesthetic, and identity. These dimensions are present in different way in the speech of the interviewed persons.

In the description of the value shared by the persons we classified in a single group in our typology, we tried as far as possible to conserve the diversity of the speeches expressing these values.

Values of type 1: Extensive ovine meat breeder.

- Open land scapes are beautiful. **Aesthetic value**
- Emotional attachment to the sheep, **Identity value**
 “Mon grand père occupait l’espace avec les moutons¹”,
 « Ce n’est pas un pays de vache ici² »
- Recognition by cultural identity, **Identity value**
 « J’aime gérer les parcours³ »
- Buxus and pine are invading, **ecological and identity value**
 « Les arbres [pins] n’ont pas de valeur⁴ », « ils n’ont rien à faire dans le
 paysage »
 « Une bonne raison d’attaquer le buis est qu’avant le paysage était libre⁵ »,
 « Traditionnellement, le pin [noir d’Autriche] n’a rien à faire là,
 traditionnellement ici c’était une forêt de chêne⁶ ».
- Agro-environmental measures are accepted : **ecological value**
- Strong **ecological values** connected to **economical values**;
- We would like self sufficiency to feed sheep, **socio-economic value**;
- CAP subsidies are unfair, **ethic (justice) value**;
 « La prime oriente la production en France⁷ »
 « Ce n’est pas juste que les systèmes de production qui ne nourrissent pas les gens
 ont les mêmes droits aux subventions⁸ »
- “We want to have neighbors” **Social value, solidarity.**
 « Nous voulons avoir plus de voisins, que l’on partage l’espace entre les
 différentes utilisation mais on ne voudrait pas que leurs actes de loisirs deviennent
 notre problème⁹ »

Value of type 2: stakeholders worried by the landscape evolution.

These people want to use the landscape for the development of ecological tourism:

- Need to have landscape managers, **ecological and economic value**
- No local, **identity value**
- Farmers are part of the landscape, **aesthetic value**
- Agriculture and its technical are not well known, **social value**
- Negative value on CAP policies, **politic value**

¹ My grand pa was occupying the space with the sheep.

² It is not a country of cows here.

³ I like to manage the rangeland.

⁴ Trees don’t have any value

⁵ Another good reason to attack buxus is before the landscape was free.

⁶ Traditionally, pine wasn’t here, traditionally it was here an oak forest.

⁷ Subsidies direct the production in France.

⁸ It’s not just that farming system that are not feeding people have the same kind of subventions.

⁹ We want more neighbours, to share the space between the differents uses but we wouldn’t like their hobbies become our problem

« On ne met pas en valeur le côté sauvage [de la région] ¹⁰ »
« Les domaines privés de chasse, ce n'est pas normal ¹¹ »

People want to use the landscape for other economic activities:

- Water is a big issue. **Ecological value but also economical.**
- Landscape is particularly appreciated and they like it the way it is. **Aesthetic value.**
« Le paysage caussenard est très spécifique, ce serait mieux de ne pas le changer ¹² »
- Collective value: **Solidarity value.**

People want to express a romantic/ideological point of view of the Nature:

- They have strong **ecological value**, in particular about biodiversity (fauna and local flora).
- Desire to conserve the diversity of spaces (forest, fodder). **Ecological value.**
- « Pessimistic », they predict the landscape will be a mosaic. They think that future of landscape is not in agriculture.

They have strong ecological values, especially on biodiversity. They would like to maintain forest as well as grasslands. They are quite pessimistic and they predict a mosaic of open grassland and forests landscape.

Value of type 3: Farmers whose first objective is to improve their livelihoods.

« Je dois vivre de mon travail ¹³ »

- Agriculture is a means to improve their livelihoods, **identity value**
- Strong economical value “Nous devons vivre de cela”
- Landscape of Causses is appreciated. **Aesthetic value**
« Je ne voulais pas partir d'ici ¹⁴ », « Pour la notion d'espace, d'immensité, l'idée du bout du monde », « Un coup de foudre pour le Larzac ¹⁵ »
- We have to find market for our product. **Economical value**
- No ecology for its own sake;
- Need help and subsidies. **Economical value**
- Rangelands are becoming more difficult to maintain due to climate change and no man use. (Climate change and use of boxwood is abandoned, size of the farm) **Ecological value.**

« Sans aide, on ne peut pas être autonome pour lutter contre la fermeture du milieu ¹⁶ ».

¹⁰ We are not highlighted the wild side [of the region].

¹¹ Private areas for hunting, it is not fair.

¹² Causse landscape is very specific, it would be better not to change it.

¹³ I have to make a living of my work.

¹⁴ I didn't want to leave from here.

¹⁵ A love at first sight for Larzac.

¹⁶ Without help we cannot be autonomous to fight against the closing landscape.

- *Value of type 4: People involved in the commercial and industrial development are less worried about the evolution of the landscape of Causses.*
- Double activities for farmers, **economical value**
- « Les gens font beaucoup de choses pour l'argent ¹⁷ », **economical value and capitalistic**
- « Les vaches sont rentables dans ce paysage, même si mon grand père me désapprouverait ¹⁸ », **socio-economical value.**
- “Plus vous investissez dans l'agriculture, plus vous perdez d'argent ¹⁹”, **economical value**
- Competition for land is costing us money, **economical value**
« *Le soleil nous coûte cher* ²⁰ »
- Pragmatic value
- Intrusive species are not really a problem.
- Agriculture will be good for tourism, nothing more, **socio-economical value**

2.3 Evolution process of the landscape of Causses

The landscape dynamic has been considered as a privileged door to collect the perceptions of the interviewed persons about the landscape, agriculture and rangeland.

Identification of the process of evolution mentioned during the interviews.

We identified about 20 processes of evolution mentioned during the interview. The majority of the interviewed persons have mentioned the **closing landscape**, observed a **diversification of the breeding** (bovine, equine). In terms of evolution, the **erosion of the grazing land** is often mentioned as well as the increase of fences.

The final main point is about the diverse form of tourism: capacity of lodging (gîtes, hôtel), footpaths, big reception facilities (Belvédère de Navacelles).

The exhaustive list derived from the interviews is:

- **Erosion of the grazing land:** space cover with buxus for example
- **Closing space:** renewed outbreak of the tree over the all territory of Causses.
- **Introduction of new animal species** (Bovine, equine etc.) en grazing land forecast before for transhumance. About bovine, the European primes have promoted the introduction of dairy cows (PMTVA).
- **Put up the fences:** concern rangeland used before by shepherd. Financial help are also granted to put up fences.
- **Climate change:** there are two main phenomena i) spring frost ii) long summer drought.
- **Tourism development:** first hotel room in 1973 and increasing of the reception capacity since the years 90.
- **New forestry plantation:** mono specific in conifer. (ONF).
- **Urbanization:** due to an external dynamic (second home and old people's home)

¹⁷ People are doing lots of thing for money.

¹⁸ Cows are profitable in this landscape, despite my grandfather would disapprove me

¹⁹ The more you invest in agriculture, the more you loose money.

²⁰ The sun is costing us expensive.

- **Rural depopulation:**
- **Extensification:** decreasing animal per hectare (Subsidies for pastoralism) and few inputs.
- **Intensification:** concentration of inputs on farm's area
- **Road infrastructure:** construction of highway and Millau Viaduc.
- **Adduction of drinking water**
- **Points of water:** salvage of rainwater (lavognes)
- **Other issues:** commercialization (direct sale, fair...)

Figure 1 : Chronology of the landscape evolution in the region based on the identified processes.

Processus	Av1960	1960	1970	1980	1990	2000
Forest plantation	1860					
Roquefort Interprofession	1920-30					
End of buxus use						
Rural depopulation increase						
Tap water adduction						
Increase of fences						
CAP productivist						
Intensification						
Guest house (tourism)			1973 1er Caylar			
Introduction of bovine				PMTVA		
Landscape closure						
Grazing land erosion						
Diversification / pluriactivity						
CAP - prod + environment						
Extensification						
Highway Viaduc						
Natura 2000 / MAE						
Increase population						
Changing climate			1976			
Alternative Commercialization						

Sources : enquêtes « Ecole Thématique CIRAD/Agropolis-Fondation, Octobre 2009 : « Formation aux méthodes des sciences humaines appliquées à l'agroforesterie »

Four main periods emerge from our analysis based on collected information during interviews:

The first period (light grey): from 19^e to early 20^e, the first **forestry plantation** (1860). This period is characterised by the materialization of the Roquefort interprofession

and the decreasing anthropogenic impact on the landscape with the **end of buxus use** (wood tool, litter, bowls).

From 60 to 70 (grey), rural depopulation is strong and in parallel, productivity is supported by Communal Agricultural Policies (CAP), hence an **increase of fences** (intensification). In order to maintain agricultural income, a diversification appears with **tourism** (rural guesthouse, first *chambre d'hôte* of l'Hérault in Caylar in 1973).

In the 80s(dark grey), CAP changed its orientation and abandoned its support to agricultural prices to enhance subsidies for the environmental protection (MAE). European subsidies called « prime au maintien des troupeaux en vaches allaitantes » incite to develop an **extensive bovine breeding** in this area. This period is marked by an acceleration of the landscape degradation: **closing spaces, grazing land erosion**.

From 2000 (very dark grey), the CAP is built on two pillar: (i) production, (ii) environment. (i) is less and less abundant whereas (ii) is strengthened with more and more **constraints on environmental impact** (Natura 2000, MAE). Commercialization strategies diversify. Finally, extreme weather is felt as a threat (spring frost in 2003 and bad distribution of the precipitation, during the last four years) whereas tourism is developing with infrastructure such as viaduct de Millau.

Unequal evolutions perceived by different stakeholders








































Data about evolution processes mentioned in the interviews have been crossed checked, with the classification of the interviewed people in the typology (Cf. Table 2).

The closing space and the climate change are both processes mentioned by four types of stakeholder and are not relevant to distinguish the position of the group as far is concerned the evolution of Causes.

To perceive differences between groups, it's interesting to look at the grazing land erosion. Type 1: Extensive ovine meat breeders, worried about the landscape closure are also concerned by the land erosion. To the contrary, type 2: they are worried about the landscape evolution, mentioned less than type 1, the land erosion but place more the importance of tourism. This shows us they are more interested in the consequences than in questioning the causes of the closing landscape.

Figure 2 gives information about the dimensions of the landscape and the agriculture to which different stakeholders are sensitive. These different sensitivities are related to the professional stake and to their project: extensive or intensive agriculture or non agricultural projects and activities relying on landscape.

Figure 2: Importance of processes of landscape evolution according to the types of actor

	Type 1	Type 2	Type 3	Type 4
				
Closing landscape				
Over-grazing				
Introduction of bovine				
Tourism				
Water (adduction, point abreuvement)				
Rural depopulation				
Fences				
Intensification				
Forest plantation				
Others commercial issues				
Highway				
Climate change				
Extensification	X	X		

The size of the pictograms indicates the importance of the evolution process according to the stakeholders interviewed

Cation :

- * **Type 1** = Extensive ovine meat breeder
- * **Type 2** = Stakeholders worried about the evolution of their landscape
- * **Type 3** = Farmers whose first objective is to improve their livelihoods
- * **Type 4** = People whose preoccupation of commercial and industrial development of the area is a priority compared to the evolution of the landscape of Causses

Sources : interviews « Ecole Thématique CIRAD/Agropolis-Fondation, Octobre 2009 : « Formation aux méthodes des sciences humaines appliquées à l'agroforesterie »

2.4 Role of stakeholders on rangeland evolution

The 3 processes of landscape evolution most cited are:

1. landscape closure
2. grassland degradation, and
3. fencing of pastures

Table 2 indicates the stakeholders concerned by these 3 processes according to the people interviewed.

Table 2: Functions of the actors in 3 processes of landscape evolution

Stakeholder mentioned	Role of stakeholder in the processes, as it was mentioned during the interviews
Land owner, heir Not resident. Not farmers.	Plant pine or abandon their land
Other farmers and breeders	Objectives divergent between different categories of farmers and breeder
Shepherds	They have disappeared with the possibility to maintain the rangeland
Small breeder	They don't have any successors. The land abandoned are closing themselves
Youth	They are too few. Don't continue the small farms but they go to town
Retired farmers	They contributed to maintain the landscape open during their professional life.
Industries : manufacturer of bowls with buxus	The disappearance of this activity contributed to close the landscape. Since then, buxus don't have any commercial use.
Technicians, bank, French Estate and CE	They supported technical changes (fence, cattle breeding) which contribute the disappearance of open landscape and rangeland. On the other hand, they have also supported maintaining the grazing land with the MAE and the "prime à l'herbe".
ONF	Promoted the pine forest plantation
CPIE	Lead actions to help farmers, but that are not compensating the current evolution. They do not always have the same priorities as the inhabitants. Its presence and actions are not always understood by the population.
Sources : enquêtes « Ecole Thématique CIRAD/Agropolis-Fondation, Octobre 2009 : « Formation aux méthodes des sciences humaines appliquées à l'agroforesterie »	

2.5 Stakeholders strategies face to the landscape evolution

Five strategies participate to the landscape evolution of Causses.

1. Removal of invasive vegetation
2. Intensification
3. Extensification
4. Diversification
5. Energizing the local economy

a. Strategy 1: Clearing

Dealing with the transformation of the Causses landscape essentially involves the localized removal of invasive vegetation responsible for the process, namely the bush *Buxus*. Since this problem is widely recognized by the population, stakeholders involved in this process are numerous. Nearly all our respondents identified this issue and presented an idea of possible or actual strategy to deal with it.

In the past, extensive sheep grazing in the rangelands was sufficient to control the growth of invasive vegetation. As of today, the remaining sheep herds now graze in fenced paddocks due to the disappearance of shepherding. They can no longer fulfill their role of landscape architect, especially in areas that are far or not easily accessible.

Clearing struggles efficiently against the closure of landscape by the buxus. All types of stakeholders practice this strategy. Several means are used:

- Local practices. At the farmers scale:

“The landscape is closing (...) sheep is the best gardener.”
“To fight against encroachment micro-burning, burn-beating, grazing, crushing... are technique used.”

Mechanical removal of bush and scrub has therefore taken over as the main recognized strategy for dealing with encroachment.

- Most respondents were aware or involved in the LIFE project, sponsored by the European Union in 2003/2004. The CPIE was recognized as a key facilitator of this initiative, involving local farmers in scrub clearance in many areas that are now regularly maintained. Today, agri-environment schemes offer for example the option of a 5-year contract where the farmer is paid for specific environmental actions including removal of invasive vegetation, also funded by the EU and facilitated by the CPIE; the Chamber of Agriculture also offers subsidies for similar actions.
- Technical support, by CPIE and technicians.

b. Strategy 2: Intensification

Intensification of farms in the Causses is at the same time a process that has affected landscape evolution, but is also a strategy in itself in order to cope with drastic changes in economic, social and technological changes. Intensification is directly link with fence implementation. In our typology we have noticed that traditional meat sheep farmers are one group which is not adopting this strategy. This suggests that unlike farmers in group 3 (farmers prioritizing their livelihood) which is the biggest group resorting to intensification, meat sheep farmers are staying faithful to its traditional extensive practices.

- Nearly all the farmers we interviewed relied on agricultural subsidies as part of their income. Apart from Common Agricultural Policy funds and other subsidies, subsidies given for milking cows have led to an increase of the number of cattle farmers in the area.
- Due to the decreasing number of farmers, those that remain may try to increase the size of their holding by purchasing or renting more land, allowing them to support a bigger herd.
- However, the most significant tool for agricultural intensification has been the technical innovation: mechanization of farming practices, especially in relation to dairy farming; agronomic research has also improved nutrition and breed selection to maximize production.

c. Strategy 3: Extensification

In opposition to some farm decisions which involve intensification, some farmers choose to reduce their costs through intensification.

This strategy is often used by type 1: “*Extensive ovine meat breeder.*” It consists of:

- The decrease of herd density is either achieved through decrease of total number of animals.
- The increase of total grazing land available. This includes use of rangelands with difficult access or low quality grazing, as well as grazing underneath trees. Moreover, access to topographically difficult grazing areas can be achieved via the use of different livestock species – goats were a frequently mentioned possibility.

d. Strategy 4: Diversification

Maintaining a sustainable livelihood, especially in terms of income, is increasingly difficult on the Causses. Reliance on constraining subsidies and price drops for the sale of farm products has forced many farmers to diversify their practices in order to survive. Farmers of type 1: *Extensive ovine meat breeder*” are not concerned by this strategy.

- The diversification of activities indirectly changes the landscape through the implementation of tourist installation within farms. We recorded many farmer initiatives in this direction, such as breeding of wild boars and deer for hunting, horses for leisure or competition, and creating tourism and hospitality services (small museums, bed & breakfast, crafted products etc). Diversification of tourism and hospitality is also a strategy at the regional levels with an attempt to bring in tourists from various sources and interests – from nature trails to gastronomy.
- We have observed many innovations in term of commercialization of agricultural products, with a strong focus on short market chains (direct sales for example), as well as marketing of high-quality products such as organic, AOC or “mouton du Larzac” meat.

e. Strategy 5: Energizing the local economy

This strategy mainly concerns elected representatives and technicians/managers on a village or “communauté des communes” scale. However it is also common amongst type 2 ‘*stakeholders worried by the landscape evolution*’.

- A significant focus is on stimulating tourism through promotion of the region’s unique qualities, namely the landscape, sites of special conservation (“Grand Site de France” of Navacelles) and traditional rural lifestyles. There is an ongoing initiative to designate the Causses as a UNESCO World Heritage site.
- We have observed significant investment in tourism infrastructures around the area, despite important protests from the residents against any form of “mass” tourism.
- Many efforts have been made over the years to make the Causses villages attractive to prospective settlers, especially in terms of amenities, shops, and cultural and leisure activities. For example in the Causses of Blandas, young farmers can benefit from financial support offered by the “communauté des communes”.

CONCLUSION

Landscapes of Meridional Causses are a specific French heritage, supporting the identity of a part its inhabitants. Its preservation is at stake. However, directly linked with agrarian history, the processes are currently changing the landscape, in particular, the function of the rangeland. The landscape is closing, colonized by bushy and tree vegetation; rangeland are fenced; pine plantation appear here and there. Face with this evolution which was negatively judge by most of the stakeholders interviewed, their reactions vary according to their profession, social commitment, or their professional project.

So, people of Causses see the future of “agropastoralism” (word rarely pronounced but whose farmers know the practices Cf. Type1) according to the 5 following perspectives.

1. Landscape preservation and management

The general consensus among stakeholders is that landscape will be a mosaic of landscape in future. (I.e. it will be mixture of opened and closed lands). This is a cause for concern and hence there is a need to manage the territory by opening the spaces. This can be done by establishing contracts with the farmers. In fact, some efforts have already been made and are currently carried out in this way by CPIE. Furthermore, to manage the landscape efficiently, stakeholders feel that they need to increase the population on the territory. On the other hand, farming activities should be led with the help of local institution what will help maintaining agropastoralism whose impact on the landscape is positive.

2. To improve income and attract young farmers

Farmers who want to make a living from agriculture (type 3 of our typology) feel the need to find out meaningful measures such as mechanization, maximization of production and genetic breeding of livestock to have sustainable livelihoods without affecting the inherent values of the region.

3. New market opportunities for specialized projects from the region

In order to improve livelihoods of the farmers in the region, stakeholders feel that it is necessary to look for new market opportunities for specialty products such as goat's cheese. Some of them mention that it is easy to do it by improving the value-added of the local agricultural production, relying on its strong regional identity (Ex: ewe's cheese production recall the identity of Causses by the Roquefort appellation and by the presence of ewe in the landscape). Beyond this, strengthening efforts relating to cooperative sector would open up new horizons for the region.

4. Promotion of tourism in the region

Tourism is another potential factor that can be profitably utilized for developing the region without affecting its environment. The stakeholders of the region felt that this potential needs to be further promoted. Some places such a *Cirque de Navacelles* need to be further encourage as a center of attraction in addition to the museum and handicrafts installation.

Stakeholders think it would be positive to have their landscape registered at UNESCO heritage. It would be possible to advertise and promote the identity of the region. However, people felt that it should be understood that the future of the Causses requires coordination between its economic and ecological development through the promotion of agriculture and tourism.

5. Coordination of various stakeholders efforts such as farmers, elected members, government officials, hunters, CPIE and ONF

Many people interviewed felt that stakeholders of the region can come together and develop proper guidelines and policies for carrying out the above activities, in addition to subsidies issues. It was strongly felt the need to recognize the importance and the role of each stakeholder to work together, beyond divisions between the personal objectives of committed people in different activities.

BIBLIOGRAPHY

- Balent G. and Gibon A. "Organisation collective et individuelle dans la gestion des ressources pastorales : conséquences sur la durabilité agro-écologique des ressources."
- Bonnamour J. 1995. "Conséquences des limitations du droit de produire sur les dynamiques spatiales agricoles et les équilibres régionaux en France."
- Bousquet V. 2007. "Les Causses méridionales : un territoire pastoral garant de biodiversité."
- Brossier J. and Dent B. "Gestion des exploitations et des ressources rurales : Entreprendre, négocier, évaluer." *Etudes et Recherches sur les Systèmes Agraires et le Développement*
- CPIE. 2005. "Rapport de description et d'analyse de l'existant " CPIE des Causses Méridionales
- CRPF (Centre Régional de la Propriété Forestière). "Le sylvopastoralisme : Concilier gestion forestière et conduite pastorale en forêt privée."
- Garde L. "Guide pastoral des espaces naturels du sud-est de la France,." CENTRE D'ÉTUDES ET DE RÉALISATIONS PASTORALES ALPES-ÉDITERRANÉE.
- Gibon A. and. 2005. "Managing grassland for production, the environment and the landscape. Challenges at the farm and the landscape level." *Livestock Production Science* 96
- Girard N, Bellon S, Hubert B, Lardon S, Moulin C-H, Osty P-L,. 2001. "Categorising combinations of farmers' land use practices: an approach based on examples of sheep farms in the south of France." Pp. 435-459 in *Agronomie 21* edited by EDP Sciences: INRA.
- IFAD. "Livestock and Rangeland Glossary."
- Jollivet M. 2007. "La grande transformation de l'agriculture française sous l'oeil du sociologue." Pp. 300 in *Economie Rurale*, vol. 26-29.
- Laurent C and Remy J. 1998. "Agricultural holdings: hindsight and foresight." *Etudes et Recherches sur les Systèmes Agraires et le Développement*.
- Léger F, Bellon S et Guérin G. 2000. "Outils et méthodes pour analyser les ressources au pâturage. - Rupture... nouvelle image de l'élevage sur parcours." *Options Méditerranéennes*, Sér. A.

Molenat G, Foulquie D, Autran P, Bouix J, Hubert D, Jacquin M, Bocquier F et Bibe B,. 2005. "Pour un élevage ovin allaitant performant et durable sur parcours : un système expérimental sur le Causse du Larzac." Pp. 323-338, vol. Prod. Anim., 18 (5): INRA.

Natura 2000. 2006. "DOCOB (Document d'objectifs) des sites Natura 2000 : FR 9101383 "Causses de Blandas", FR 9101382 "Causses de Campestres-et-Luc", FR 910 1385 "Causse du Larzac"."

OCAGER (Opération Collective d'Aménagement et de Gestion de l'Espace Rural). Juillet 2006. "Programme de gestion des espaces agricoles, pastoraux et forestiers sur le Causse du Larzac - Phase 1." CPIE des Causses Méridionaux.

Programme L.I.F.E., "Grands Causses" Sous-programme "Causses Méridionaux". 1994. "Méthode de diagnostic préalable a la mise en place d'une opération locale."

3. APPENDIX

Appendix 1: press release on thematic school

<http://www.cirad.fr/actualites/toutes-les-actualites/communiqués-de-presse/2009/formation-agroforesterie>

Appendix 2: List of participants of the thematic school.

01	Mme	Cindy ADOLPHE	Doctorante IRD-MNHN (France)
02	M.	David Nicholas BARTON	Chercheur NINA, Norwegian Institute for Nature Research (Norvège)
03	Mme	Stéphanie CARRIERE	Chercheuse IRD (France)
04	M.	Youssouf CISSE	Chercheur Institute for Rural Economy (Mali)
05	M.	Pierre CLINQUART	Etudiant ingénieur agronome PURPAN (France)
06	M.	Ibrahima DIOP	Enseignant ISRA (Sénégal)
07	M.	Charles GALABUZI	Chercheur Faculty of Forestry and Nature Conservation (Ouganda)
08	M.	Mohana GUDDE SEETARAMA RAO	Assistant professeur University of Agricultural Sciences Bangalore (Inde)
09	Mme	Sylvie GUILLERME	Chargée de recherche en géographie CNRS (France)
10	M.	Johann HUGUENIN	Chercheur CIRAD (France)
11	M.	David LANGAT	Senior Research Officer KEFRI (Forestry Research Institute) (Kenya)
12	Mme	Louise MEYLAN	Doctorante CIRAD (Belgique)
13	Mme	Mathilde MONTZIEUX	Ingénieur ISTOM (France)
14	Mme	Sabine NGUYEN BA	Ingénieur ISTOM (France)
15	M.	Oumarou PALOU MADI	Chercheur IRAD (Cameroun)
16	Mme	Volatiana Minah RAFALIMARO RANDRIAMIALISOA	(Madagascar) Etudiante Faculté des lettres et sciences humaines
17	M.	Bruno RAPIDEL	Chercheur CIRAD, CATIE (Costa Rica)
18	M.	Guillaume ROUSSEAU	Consultant en plantes et écologie du sol CATIE (Costa Rica)
19	M.	Mahamoudou SAID	Enseignant chercheur à l'université des Comores
20	M.	John TABUTI	Professeur Associé Institute of Environment and Natural Ressources (Ouganda)
21	Mme	Lucie TEMGOUA	Enseignante Université de Dschang (Cameroun)
22	M.	Cristobal VILLANUEVA	Spécialiste en élevage bovin durable CATIE (Guatemala)

Appendix 3: Interview guideline

- 1) Can you tell us more about your set-up on the Causes?
- 2) What is your professional story?
- 3) Can you describe your activities?
- 4) What is your perception concerning the *Causses Méridionaux*?
- 5) What changes did you remember on the landscape?
- 6) What problem do you have?
- 7) What are your plans?

Appendix 4: Interviews groups

Group 1

Charles GALABUZI
Mohana GUDDE SEETARAMA RAO
David LANGAT
Louise MEYLAN

Group 2

Bruno RAPIDEL
Sylvie GUILLERME
John TABUTI
Youssouf CISSE

Group 3

Stéphanie CARRIERE
Ibraïma DIOP
Johann HUGUENIN
Volatiana Mina RAFALIMARO RANDRIAMIAALISOA

Group 4

Cindy ADOLPHE
Pierre CLINQUART,
Sabine NGUYEN BA
Mahamoudou SAID

Group 5

Guillaume ROUSSEAU
Mathilde MONTZIEUX
Oumarou PALOU MADI
Lucie TEMGOUA