

# Landscape study of the interactions between nature and society: a training course to analyse an agrarian system in a territory

Mireille Dosso<sup>a</sup>, Soulard Christophe<sup>b</sup>

<sup>a</sup>Montpellier SupAgro, Institut des régions chaudes, UMR Innovation, Montpellier, France; <sup>b</sup>INRA, SAD, UMR Innovation, Montpellier, France – [dosso@supagro.inra.fr](mailto:dosso@supagro.inra.fr)

**Abstract:** *The space is a simple way to aboard the complexity of the interactions between society and its natural environment. In countries where agriculture is the dominant activity and where cartographic documentation is non-existent or inaccessible, the landscape study becomes a precious tool to analyse agrarian systems. Experience shows that by working quickly ( 2 days) on a given area with a group of students on 5 subjects (the organization of the biophysical environment and changes of observation sites; water in the landscape and its use ; the demographic trend and results seen in the urban part of the landscape ; land structure and evolution of the cultivated space ; inheritances of the past and current interventions on the land), we are able to describe: 1) that a landscape is dependent on the chosen observation sites (all the parts of the landscape are not visible from a single viewpoint), 2) that a landscape evolves (requiring historic surveys to trace its evolution), 3) that the determining factors of its evolution can be outside the study zone (requiring the study zone to be placed in relation to its environment). The training course combines three types of teaching tools which will be presented in the poster : the teaching film, the field trip and the analysis of an information file.*

**Keywords:** *landscape study, observational behaviour, student in agronomy, geography.*

## Introduction

The overall objective of the exercise is to learn to observe, to describe and to analyse interactions between a bio-physical environment and the human activities that take place within the environment, based on an analysis of the landscape. The immediate purpose is to describe the process: this starts by observing the landscape from a specific viewpoint, which leads to an enquiry and to the formulation of a hypothesis about its composition and functioning (in the form of diagrams), and finally the validation or invalidation of the hypothesis by collecting complementary information (observations and enquiries) and deciding the path to follow through the study area.

The exercise is designed for two classes of future agronomists (equivalent of MSc) who are preparing for a career in rural development. It is a basic sequence which takes place in the beginning of two training programs about territorial studies and methods applied in agriculture.

The first one concerns future agronomists, opening jobs in rural development in the warmer regions of the world. They have to build capacities so to be able to practice agrarian assessments which are necessary for the management of development projects in different countries. In this context, landscape study is important as it introduces to the complexity of the interactions between nature and society; and this exercise leads to the improvement of the capacity to decipher such a complexity. After that, the teaching goes on with the analysis of the diversity of agricultural production systems, and their technico-economical evaluations. The second one concerns future agronomists, opening jobs in territorial development and land planning in France and Europe. For them, the aim is to master different kinds of tools which are currently used by the rural and urban planning deciders. The landscape study is an original way to take into account the interactions between agriculture and the others structures, activities and projects. The objective is to situate this approach as regards the other cartographics tools and databases, specially the geographic information systems. For them, landscape study is part of a training programme about the territorial management. After that, they will continue with the social and economics aspects of the relationships between agricultural activities and space, and local public policies.

## Teaching tools

The teaching tools used in this training module (which lasts two days) are listed below in the order in which they are used:

A 20-minute extract of a documentary **film** (*Anatomy of a Landscape*, by Philippe Pinchemel and Jean-Louis Tissier, 1979) on the analysis of three types of rural landscape in the Languedoc Region: Saint-Jean-de-Buèges (*garrigues* in the vicinity of Montpellier), Saint-Martial (southern Cevennes) and Lunel (a plain planted with vineyards). The comments by the author (a geographer) on the three examples provide a guideline, technical vocabulary and a number of different concepts which are then put into practice in the landscape analysis exercise that follows.

A **reader's guide**, inspired by the same geographers (P & G Pinchemel, 1987) with diagrams added as a aid for landscape analysis (main sources Brunet, 1987; Benoît et al., 2006; Deffontaines et al., 2006; Maigrot, 2007), suggests a route for the students to follow when analysing the landscape. The methodological guide is presented and commented on in the classroom. The students receive a printed version as a teaching aid, which can also be used as a blueprint in the field.

The **site** chosen for the field exercise in the autumn of 2007 was the landscape that can be observed from the *Rocher du Causse*, which is located about 30 km north of Montpellier. From this hill, two rural landscapes can be observed that are typical of the *garrigues* around Montpellier (David, 2006): Claret to the north and Lauret-Valflaunès to the south.

On their return from the field trip, the students receive a **folder** with additional information to help them prepare their field report. The folder contains topographical maps (NGI, scale 2500 and 10000), an old map (Cassini), population and agricultural statistics (INSEE, SCEES) for the study area (canton), and certain administrative information concerning the study area (local authority boundaries, zoning).

## Method and implementation

### Sections of the reader's guide

**Stage 1:** Analysis of landscape features. After having got their geographical bearings, the students are encouraged to look at the landscape as they would look at a picture whose composition they have to describe: the plans to be identified (diagram to be drawn) and the contents of each plan, i.e. the number of elements of the landscape and the units within which they are located (labelling of diagram) (figure 1).

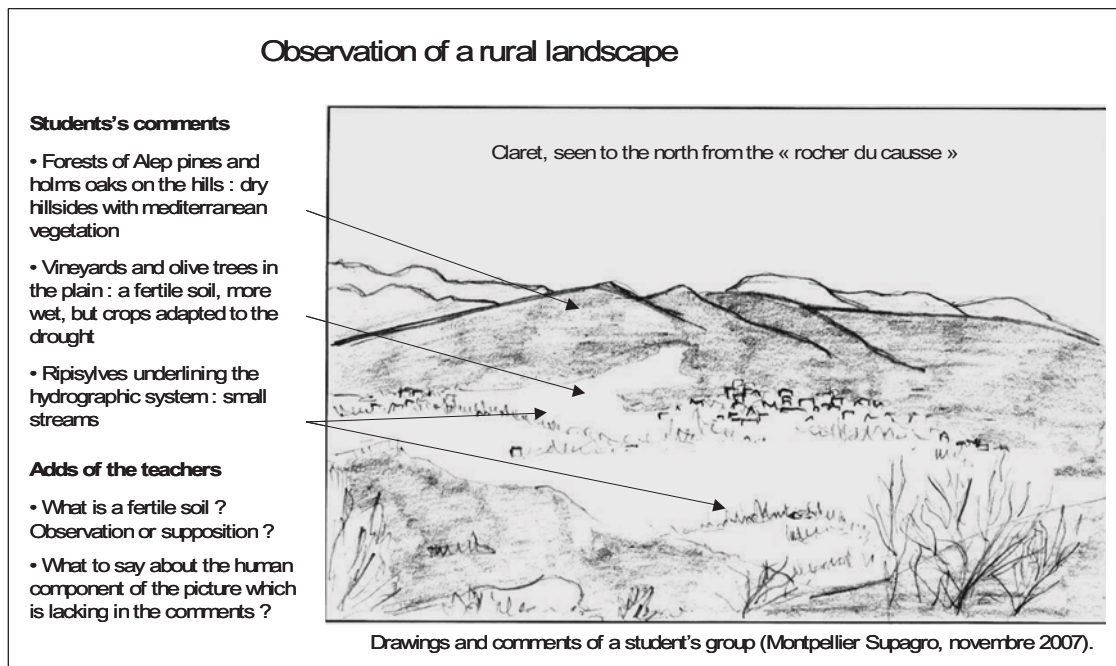
### Stage 2: Analysis of ecogeographical and human aspects<sup>1</sup>

- Hypotheses are proposed about the general organisation of the bio-physical environment. These are based on the identification of visible relations between the landscape relief, hydrography, vegetation and climate. At this stage, the hypotheses take the form of sketches of the organisation of the environment (sections or plans) at the scale of the study area.
- The links between the bio-physical environment and human occupation are identified. The diagrams are then « completed » with observations of different forms of human activities (planted woodlands, cultivated land, built-up areas, road networks, etc.) that are visible in the landscape: both traces of past activities and signs of recent changes.
- At the end of this stage, hypotheses on the interactions between Nature and Society are formulated in order to select one or more pathways through the study area to collect additional information and improve the hypotheses. The information may come from closer observations but can also be obtained by talking to local inhabitants or from centres of information along the way. Emphasis is placed on the need to vary the scale of analysis of the phenomena by proceeding from an overview of the general organisation of the landscape to a close up of details that reveal the organisation. Students can use digital cameras to gather information along their way through the landscape.

<sup>1</sup> Note: the order chosen for this exercise does not presuppose a hierarchy of factors that determine a landscape (this is very well explained by Philippe Pinchemel's film: in our case the guide has been adapted for the analysis of a mainly rural landscape).

**Stage 3:** The students are divided into groups for more detailed analysis of the interactions between the bio-physical environment and human activities. Each group has its own topic to pursue within the same landscape

Figure 1. The description of the Landscape like a picture



### Choice of topics and reasons for the choice

The number of topic areas is partly determined by the number of students and the limited time available to discover the study area. Once the time limit has been taken into account, the choice of a topic should combine two objectives:

**One methodological objective:** to consolidate the hypotheses by varying the temporal and spatial scales of observation. The aim is to identify interactions between Nature and Society but to avoid getting « locked » into a local context. In 2007, three groups were formed:

- One group was concerned with « changing the point of view » (in space) by moving around the study area and changing the scale of observation of the natural environment and its relations with human occupation, discovering areas that were initially concealed, and linking and comparing structures and functions that were initially taken for granted by observing them from different viewpoints;
- Two groups focussed on « **vestiges of the past** » and « **recent changes** » to detect signs of changes in human activities, land acquired (conquest, retreat), different forms of exploitation of the environment and relations with the surrounding area. Identification of yardsticks that indicate the historical eras of the landscape to enable them to draw diagrams of the chronosequences of the landscape.

**One thematic objective:** i.e. to examine in some detail topics corresponding to the fields of competence of agricultural engineers working in rural development:

- One group was concerned with « **water in the landscape** »; water was chosen as natural resource to illustrate an environmental approach to a rural area. In Mediterranean environments, water is an important limiting factor for the habitat and for agriculture and is thus a particularly suitable topic to illustrate how the relationship between Nature and Society originated and subsequently changed. To this end, the group was asked to analyse the landscape and the existing situation and identify the problems caused by the simultaneous need to conserve the water resource and to satisfy human requirements, with the final aim of identifying the preconditions for subsequent analysis of the actors and territories involved in water management.

- One group was concerned with « **cultivated land** »: here the landscape was used to raise the students' awareness of the multi-dimensional aspect of the relations between land and agriculture, i.e. to encourage them to look beyond production or a sector with which they were already familiar. The aim is to identify everything a landscape can teach us about land functions and the factors that influence changes in agricultural activities. Landscape analysis should enable the formulation of a set of hypotheses and preliminary questions for a land-based analysis of the regional agrarian system.

### Report on field work

The training module lasts two days. The purpose of the first day is to describe and implement the method in the field. The second day is spent processing the resulting information and writing up a field report. A report is written by each group following instructions that are the same for all the groups. Each group has to present the results of their observations in the form of a commented slide-show lasting around 15 minutes (similar to commenting a map). The instructions given to the groups receive are the following: situate the research topic in the context of the landscape you observed; move from the general to the specific, i.e. from description to analysis; base your comments on what you observed before giving your interpretation in the form of questions or hypotheses; use a variety of visual aids to support your comments (sketches, sections, drawings, maps, graphic models, block diagrams, panoramic photos, close ups, etc.); end by describing more detailed studies that could follow this exercise in observation.

## Expected and actual results

Within the course of studies for future agricultural engineers, this training module takes place at the end of a course on the analysis of a natural environment within a given territory. It represents a transition stage before analysing the different types of agricultural exploitation of the environment and aims to develop the capacity of the students to integrate intersecting viewpoints between natural and human sciences, with the landscape as the vector of transition to the integrated analysis of problems in rural areas.

### Expected results

At this stage, we expect the students to be aware that:

- A landscape depends both on the point of observation and on the observer: all parts of a landscape are not visible at the same time from the same viewpoint, and, depending on the observer and on the subject of observation, the observer's opinion about the landscape will change and, as a consequence, the points of view have to be multiplied and precautions taken before conclusions are drawn.
- A landscape changes (requiring historical surveys to trace the sources of the changes) and the factors that determine such changes may lie outside the study area, which is why the landscape has to be situated in its environment (which may be far-away);
- A landscape reveals the immediately visible parts of natural and human phenomena, the majority of whose interactions will be discovered later by other means (and using other methods of investigation), analysing the landscape thus serves to create a set of hypotheses to be checked later using other means.

Despite these limits, landscape analysis provides an excellent introduction to the study of the corresponding agrarian system. Here we mean **understanding the complexity of the relations between Nature and Society**, and subsequently, situating agriculture in the context of the area in which it evolved, which should become a reflex on the part of the students. It is possible to envisage that after studying an agrarian system, one can come back to the landscape and describe the probable modes of development chosen by a given society and the landscapes that correspond to these choices. In this light, after having provided a window to the past, landscape analysis could be a tool for participatory building of the future.

## Actual results

The skills acquired during the two sessions held in October and November 2007 are still too recent for us to be able to judge the match between our initial expectations and the results actually produced by the students who followed the course, and the pertinence of the teaching method.

However, we can already present a number of both positive and negative results. Firstly, the topics focussed on **changes in scale in both space and in the long term** were problematic for the students, but positive in terms of pedagogical results. They caused problems for the students because recourse to the history of the distant past and to regional geography is not part of basic scientific culture, and the students thus did not have the right tools at their disposal either to give them confidence in their observations or the right language to report them. However, this cultural and methodological gap did not prevent them from proposing hypotheses based on their analysis of the landscape. For example, discovering that today, hills and plateaus that are forested and uninhabited, were once populated and cultivated, helped them understand the long-term transformations of agrarian systems that succeed one another over the course of time (e.g. stone walls around vineyards, terraces in wooded areas, horses grazing in former vineyards). In the same way, changes in spatial scale revealed the role of two types of external factors in a rural landscape: one demographic linked with the visible consequences of urban sprawl from nearby towns (exogenous development), and the other environmental linked with the location of the study area at the head of the watershed (quality and vulnerability of the resource).

Secondly, certain research topics proved to be more appropriate than others. For example, **water in the landscape** provides an excellent entry point for analysing the relations between Nature and Society. All the groups who worked on this topic succeeded in linking the appearance of the natural environment with human occupation and in grasping the two opposing aspects of the water that are characteristic of Mediterranean landscapes: water as a rare resource and as a potential danger. Their analysis was particularly heuristic as there was plenty of concrete evidence of « natural » water (river network, upwellings, areas without water), « agricultural » water (reservoirs, irrigation, type of cultivated soil), and « urban » water (water tanks, wells, taps) in the landscape. In contrast, the work accomplished on **cultivated land** was not particularly innovative, both because inferring original ideas from direct observation is not easy in such a short time particularly in a landscape dominated by vineyards, and because the students were less involved in actually observing the cultivated land than in transposing knowledge they had acquired elsewhere. A few original results were produced when the students focussed on specific areas, e.g. heterogeneous areas, strips of land with both agriculture and woods at the boundary of the villages, recent land-use changes for construction or development. It was only thanks to recognition of these particularities that landscape analysis provided any added value over the usual sectoral approach. In any event, given that the aim of the landscape analysis is not so much understanding the cultivated area in itself, but rather identifying possible interactions between such areas and other spaces and other land uses, this topic needs to be redefined.

## Conclusion: improving the exercise

Finally, the gap between our initial educational objectives and the results we actually obtained enabled more general lessons to be learned.

Landscape analysis is a more valuable educational window than may initially appear, as it integrates two *a priori* conflicting types of knowledge: the observer's subjectivity and the effort of objectification he will need to make. In fact, landscape analysis invites the observer to simultaneously develop the capacity to see and to observe, at the same time following a process of 'scientific reasoning' as defined by Bachelard (1969). In our case, experience has however shown that combining these two objectives implies overcoming learning difficulties that may initially be unsuspected, for example « having the courage to take the necessary time for observation », « describing what is actually observed rather than what is taken for granted », or « having confidence in what one sees and using only these observations to identify pathways for further investigation », are behaviours that our students do not find it easy to acquire.

This is why our current educational challenge is improving the conditions for the adoption of effective observational behaviour. We believe this implies proceeding in two ways. Firstly, helping the students acquire the necessary **prerequisites** to undertake a process of landscape analysis; and secondly,

helping the students to 'let go' of their **preconceptions**, i.e. only retain information that will help make the observed facts more intelligible.

The teaching aids we experimented with in 2007 will now be rethought with these aims in view, though other routes will doubtless also be explored to improve the end results and revise our overall concept. These deliberations will be the subject of a workshop.

This basic position of our educational program about landscape study explains why we didn't try to mobilise stakeholders. To develop this aspect, which is in theory easy to connect with our objectives, we would have to change the program with more time to prepare and to combine different methods of landscape studies. This year it was not possible, but it could be an interesting perspective for the next years. For the next one, we have the project to associate local actors to prepare and improve our field work. The perspective would be to make a film with landscape pictures and actors's interviews. We hope we'll make a success in this more ambitious project!

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