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When students faced rural and peri-urban realities: An interactive module on “Local integrated management for rural development” case

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Abstract: *This pedagogic experiment is carried out with students chosen by UNESCO chair for the master « Développement et Aménagement Intégré des Territoires » of Museum d'histoire naturelle and AgroParisTech Institute. We have two objectives. The pedagogic one is to increase the ability of the students to answer to local expectations and to motivate them in collaborative learning group method in a completely different environment, helping them to become actors of the project. The operational objective is to be relevant on the concrete aspect of the final restitution in front of local stakeholders on the subject of the future of their rural or periurban zone.*

Keywords: *periurban, territory, spatial modeling, stakeholders, international, rural territory development*

Introduction

This pedagogic experiment is carried out with students chosen by UNESCO chair for the master « Développement et Aménagement Intégré des Territoires » of *Museum d'histoire naturelle and AgroParisTech Institute*. Since seven years, we organize a pedagogic module to form them to be confronted with rural and agricultural development of a local territory. The world-wide origin of the students, coming for more than 34 countries during these seven years, is a great source of interaction between them, and provides a rich source of discussion with us, as teachers and researchers. They are also the future actors of the territories and would find jobs in public or private agencies on agricultural management (water agencies, local authorities, ...). So, they are directly concerned by the interactions with stakeholders and constitute a potential network of future partners.

Confronting to research results

The research trends to be teach falls within the realms of landscape agronomy and territory development.

The Landscape Agronomy phylum is coming from an agronomical trend initiated by Gras *et al.* (1989) and Fresco (1993), developed by J.P. Deffontaines with geo-agronomy (1998) and pursued by territorial agronomists (Prévost, 2005). The aim of Landscape Agronomy is to study the organization of farming activities on small geographical scales (Benoît *et al.* 2007). We now give an increasing attention to local issues as result of farming activities and environmental preservation in particular. Landscape agronomy, as an emerging discipline combines the concepts and methods of geographers and agronomists (Benoît *et al.*, 2006) on environmental and territorial issues, by respectively combining the following:

- multi-scale modeling for land-use changes and for the investigation into territorial consistencies (Fresco, 1993) from field to farm and landscape levels,

- analytical methods to describe the reasoning behind the way regional agricultural systems work. These methods notably rely on the construction and then on the spatialization of farming classifications (Mignolet and Benoît, 2001; Mignolet *et al.*, 2007),
- modelling the spatial organization of farms and agricultural activities at local levels (Lardon *et al.*, 2005) to study and reflect on technical changes and new agricultural practices,
- approaches of multifunctionality, designing innovative systems for agricultural issues and developing a common representation of resources (Lardon *et al.*, 2008),
- and taking into account the diversity of stakeholders operating in agriculture and territory management by using prospective diagnosis methods (Lardon and Piveteau, 2005) and participative methods (Angeon and Lardon, 2008).

Involved in a regional question

Since seven years, the originality of the chosen areas is that they present new agricultural challenges in peri-urban zones that were not approached before. The aim is to focus on local level of rural development (Benoît *et al.*, 1989). The complex question we want to work on with the students is about the relation between agriculture and rural development through its impact on a rural area. The choice of the rural area is of great concern for the success of our pedagogic project. This area must provide an agriculture producing amenities (positive externalities) like landscape, jobs, tourist economy, quality products...) and be under strong natural or human constraints whose survival is not sure in the context of the CAP and the other territorial politics.

The target objects in this module is the local territory managed by farming systems using natural resources. The target activity is rural territory development, both planning and management

So, for each module we confront the students to a real case study, confronting the view-points of different actors and the organization levels of different processes. The questions are: How to valorise opportunities of territorial projects for developing new agricultural activities? How the proximity of population basin changes the socio-spatial organization of agriculture? How to integrate agricultural projects in urban and regional planning? The answers are relevant for the pedagogic objective and for the stakeholders aims too.

The module framework

This module is divided in two formation sessions:

- a first session to learn methodological tools and technical data (roughly two days long),
- and a second session (three days long) taking place away from the class-room in a rural area, and experimenting theoretical and methodological propositions.

All along their formation, students are used to have technical lectures but often the future of agriculture and the stakeholder behaviours are only underlined but not developed as the main topic of the lecture. So, the methodological part of the session is focused on local studying methods coming from two research trends, landscape agronomy and rural multifunctionality.

The four methods presented and used are (Benoît, Deffontaines, Lardon, 2006):

- farm land management : we explicit the role of land constraints and opportunities in the farmer land use choices. The result is a map of opportunities/constraints confronting with the land use units, and a table crossing the land constraints (soils, slopes,, ..) and the logistics fields constraints (size of the fields, distances, ...),

- landscape observations (Deffontaines, 1996, 2001): we build a “ Visual Indicators System” through three main axes: indicators of farmer practices, indicators of land tenure, indicators of land capabilities. These indicators are mapped in the aim to identify landscape units.
- synthesis of different data (cartographics and statistics, data from documents and inquiries), with graphical modelling (Brunet, 1986), to combine the different informations and propose integrated models of territorial structures and dynamics for the diagnosis (Lardon & Piveteau, 2005)
- local stakeholders knowledge mapping (Benoît, Maire, 1992; Bonin *et al.*, 2001) : we ask to stakeholders to draw on a simple map, the units of the territory they are able to distinguish, then, we ask them to comment each unit with their own judgement. The synthesis is down through a spatial and thematic comparison between all the maps drawn by the stakeholders.

The combination of these four methods is tested on fieldworks. They contribute to combine different disciplines such as geography, agronomy and ecology and to product an integrated vision of the natural and human dynamics of the territory and the main stakes for agriculture. The mapping process used as a common support of all these methods contributes to integration of these diverse approaches.

The particular case-study takes place at the end of the formation because, at this time, the students will have acquired the necessary technical knowledge and will be able to build relevant answers to stakeholder’s expectations for the local agriculture.

This pedagogic module can be described with two types of objectives: a pedagogic objective and an operational objective. The pedagogic objective is to increase their ability to answer to local expectations and to motivate them in a collaborative learning group method in a completely different environment, helping them to become actors of the project. In this pedagogic part, we use different teaching tools from the usual lecture before the departure, to learning groups and oral presentation before and during the *in situ* phase. The original part of this exercise is the common work that students need to provide together for a collective result: a final restitution in front of local stakeholders (institutions, farmers, etc.) on the subject of the future of their rural or periurban zone. To be successful in this concrete aspect of the restitution, we have an operational objective to achieve with the students: they need to learn rapidly new themes that they did not study before in their formation or training period. The confrontation with stakeholders aims oblige to integrate these themes and to build a cross-disciplinary vision.

With this case-study collective work, the chosen pedagogic tools are used to make the students autonomous. We don’t afford them to be passive but we stimulate them by these forms of teaching to react and tell something on the points they are working on. To complete the work in collaborative groups, they have to prepare oral presentations. The students regularly practice oral presentations but in this case it can be described as a dynamic one: other groups are asked to react and complete the results. It is the beginning of their work and not only an exercise to perform in front of teachers: they see rapidly the interest of these kinds of work restitution.

At the end of this case-study, we assess the pedagogic objectives with the students who tell us what are their perceptions of the exercise. Which aspects of the course do they think they will be able to use again? Do they feel they master the methodological tools? Do they feel more ready to act when confronted with local expectations? The assessment of the students was achieved by using criteria to evaluate their participation and motivation. With this assessment, we are able to underline the required elements in terms of pedagogic and methodological tools, but also in terms of maximum number of students, length of the exercise and financial needs.

This module is not so easy to implement in our own institutions, because moving students in “real world” is more and more difficult! In fact, the fieldwork is not very well accepted in academic courses and the management is difficult for logistic and financial reasons. So, we have to do lobbying with our own institution to have the opportunities for such pedagogic process. Therefore, we, as teachers, want to continue to give students the opportunity to experience process and project

management in the real world. So, an international network of teachers and researchers, driven by the same convictions, could help to support such innovative pedagogic devices, with the contribution of stakeholders. In this learning process, the stakeholders offer to the students and teachers a real help as information resource. But, on the other hand, we build a reflexive hypothesis : having to explain the characteristics of their area, the stakeholders improved their own knowledge through the interactive explanation with the students. This hypothesis has to be test in our future research works.

Some conclusions: students in a collective learning process face local stakeholders

The lectures, the work in collaborative learning groups and the oral presentations are build to make the students able to formalise a complex question. Their perception of the strength and weakness of each kind of organisation of agricultural productions have to lead them to ask questions about the link between the territorial development and the agriculture.

Finally, we try to translate in this module the proposal written by Osty (1996) in “Methods and scales of intervention: what methodological renewal for System research?” Our purpose is to give to some students coming from all over the world some tools and to help them to develop the right attitude to be efficient in this task. Our design process through this interactive module creation is an application of Pahl and Beitz (1996) proposals on Engineering Design seen as a systemic approach.

This course aimed to provide an international network of researchers, teachers and practitioners competent in territorial integrated agriculture management.

A question has to be studied: what aspects in educational programmes of the future planners and managers of rural and peri-urban landscapes would be important in order to make interaction with local stakeholders easier and to provide more sustainable solutions for landscape management? We propose two main hypotheses:

- working in a circle between the initial question co-built with the stakeholders, the stakeholders resource mobilization, the synthesis work, and the final restitution to stakeholders has a high efficiency to improve the interaction students-stakeholders,
- using maps as a common support to collect, treat and expose the results, provide more sustainable solutions for landscape management.

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