

# Ecosystem services in Valleys and Hills of Gascogne LTSER platform

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## Description

It is a typical agricultural landscape of south western France (agricultural mosaic + forest remnants) with mixed production systems (i.e. livestock farming systems + intensive cropping systems). The total study site area is around 25 000 hectares and includes a meso-scale watershed (12 000 ha), the Nère river. The first research on the site started in 1981.

Researches in natural systems address:

- The assessment of agricultural landscape biodiversity at different scale and level of organisation
- The assessment of forest remnants biodiversity (size and isolation effect, edge effect, etc..). The implemented biodiversity indicators are grassland & forest plant communities, bird & insect communities (hoverflies & ground beetles)

Researches in social sciences address:

- The assessment of farmers and foresters management practices and strategies from farm surveys and their consequences on landscape characteristics
- The economic assessment of farmer decisions and strategies in land use and resource management practice
- The definition of scenarios of evolution of farming and forest activities depending on global changes in economic environment, in Common Agricultural Policy, and in climatic environment (the south-western part of France will probably be the region most affected by global warming and rainfall decrease – Simulated data from METEO-France)
- The consequences of the different scenarios on sustainability of private farms and on landscape structure and dynamics.
- The consequences of landscape changes on biodiversity.

Integration between researches on social and ecological systems

The integration between researches on management practices and strategies, the landscape structure and dynamics and the functioning of ecological processes is searched in the building of a multi agent (MAS) simulation model currently under progress

The study sites are in a small area of the Gascon hillsides, to the south west of Toulouse, with a mix of crop, pastures and small coppice woodlots (Balent and Courtiade, 1992). Agriculture remains the predominant activity in the area, but it is encountering difficulties in marginal areas that do not have particularly high agricultural potential. The social system is traditionally organised in "houses" which correspond to a well-identified land domain, name and social roles, which, in particular, determine the inheritance process (the "house" will be passed on to the eldest son, in most cases) and the cooperative relations between neighbours (Sourdril *et al.*, 2006).

This region is considered as an "intermediate zone", without any particular conservation value, any agricultural potential, any social challenge. Conversely, this region is considered as representative of what can be seen in large parts of southwestern France. Our closer analysis of the situation has identified several specificities of this area, such as the fact that there is a high proportion of new inhabitants from the north of Europe.

Several sub-parts of the study region were more specifically sampled, to cover fine and large scale processes, and according to the sampling constraints imposed by each disciplines. For example, ethnological studies were restricted to two small communities, while we analyzed fragmentation effects on biodiversity on a sample of 200 woodlots spread in a 30X30 km square. However, samples are selected whenever possible in such way as to superpose as much as possible and to be nested.

## Services

From woodlots

Only a few decades ago a large range of forestry products were used, including the thorns taken from the undergrowth which were used to heat bakers' ovens; and this clearing left the undergrowth accessible to animals in dry periods. Nowadays, cutting is usually carried out to obtain firewood, as well as to "straighten up" the edges and "clean up" the woodlots (dead, rotting, lightning-struck trees). Most owners have oil-powered central heating, but this is only a recent development; so they only burn wood in one or two fireplaces. Affouage cutting (right to cut in the common woodlots) was used intensively when everyone exclusively heated their homes with fire-wood. Firewood was only taken from private woodlots when the affouage cutting and "border" produce (edges of woodlots, hedges, riverbanks) was not sufficient. Some households still benefit from affouage rights, and some still make faggots, while the others light their fires using fruit crates and newspapers.

Timber cutting for home consumption (house, stables, barns) was frequent up until the nineteen eighties but is rare today. Two owners still sell firewood and one sells timber on a regular basis, but the sale of timber remains rare. Standards are nevertheless maintained at the time of each cutting for a possible sale in the future and for landscaping reasons according to the people surveyed. The sale of industrial wood was very rare despite the fact that there is a large papermill nearby. The bartering of produce (e.g. wood for bread, faggots for bricks) has completely disappeared although, apparently, it was very common in the past. The utilisation of Robinia and chestnut as fenceposts is limited since the appearance of steel posts.