(Pre)Proceedings of the 6th European IFSA Symposium

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Abril, 2004
FARMING AND RURAL SYSTEMS RESEARCH AND EXTENSION
European Farming and Society in Search of a New Social Contract – Learning to Manage Change

(Pre)Proceedings of the 6th European Symposium of the International Farming Systems Association,
Vila Real, Portugal, April 4-7, 2004-03-09

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Printing and binding:
Serviços de Reprografia da UTAD, Vila Real, Portugal

Depósito legal: 208393/04
Using a landscape scale to approach resources management and farm functions: the case of vanishing wooded structures and small ruminants itinerancy over the agrarian matrix

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Introduction

The diversity depletion of traditional rural landscapes could be the major threat of a required new multifunctional rural landscape, as a consequence of the European and National agrarian policies. The increasing compactness of woodland and agricultural matrices has been particularly promoted by the loss of local regulation (population and farming abandonment) and production intensification of new areas and most fertile soils and virtual aid of the others. Last six years, the heterogeneity of landscape interface between the woodland and agricultural matrices was investigated in three rural communities of Tras-os-Montes confronting two threatened landscape processes: (1) the vanishing punctual, linear and spatial character of wooded structures, and (2) the punctual, linear and spatial character of agricultural matrix (scattered trees, hedgerows and fences, and woodlots) and (2) the flocks’ itinerary of native sheep and goats.

Methods

In previous works (Castro in press-a, Castro in press-b), authors discriminated 4 main zones in the agricultural matrix according to its actual wooded feature pattern: households’ surroundings, meadows, hills and farthest fields. A time series analyses, concerning to the ten most representative 2ha hexagonal plots by each zone and rural community, was performed by ESRI ArcView software above aerial photographs from 1958, 1968, 1978, 1985 and 1995. Photographs were ortho-registered by PCI OrthoEngine and interpreted from present to past in order to establish coincidence of each feature over time. Fieldwork allowed identifying actual tree species occurring in each registered feature. A GPS operator (Trimble GeoExplorer II), getting along the shepherd during the entire journey, monitored the itineraries of 2 sheeps and 2 goats. Flocks monthly, from May 1999 until May 2000. Temperature and vegetation communities crossed by flocks, correlated were auxiliary noted, joining data about spatial and temporal coordinates recorded by GPS.

Results

Figures represent the main wooded structures that nowadays exist at the study sites. Main trees species are oak (F.), chestnut (C.), walnut (W.), poplar (P.), ash (S.), birch (B.), alder (A.), elm (E.) and cherry (Ch.). The decreasing trend of punctual, linear and spatial character is important near households and meadows. However, time series analysis shows that wooded structures should be important some decades before. Graphs show total (curved lines with marks) and trends (straight lines) of hedgerows (above), scattered trees (middle) and woodlots (below), as also as transformations of their character. At meadows, scattered trees were reduced from 6 to 4 trees/ha and hedgerows were reduced from 600 m to 50 meters/ha. Circular graphics show the use of territory made by sheep and goats herds, marking the importance of agricultural (arable land and perennial crops) and woodland (forest and scrubland) matrices interface in shepherding dynamic.

Discussion and Conclusion

The wooded structures of agricultural matrix suffered a severe reduction, particularly in the last decade: a vanishing character could be due both to hedgerows of hills and farthest fields. Nowadays, their amount is only a quarter of what four decades before. By other hand, no swaps among linear, punctual or spatial character occur, which was interpreted as a strong function associated to the life: feeding, animal forage, sumbery sheltering, landscape dynamics, etc. A reduced trees function demand due to both absence of local farming management and new farming systems of low connectivity among productions, leads to trees and hedgerows cede down to obtain cash incomes. Spatial structures amount (woodlots) wasn’t apparently affected; nevertheless important changes in species - falow fields detected. Linear and punctual structures reduction contributes to increase compactness of agricultural and woodland matrices; ecological and aesthetics consequences could be anticipated if nothing actions to stop it. Consequences won’t be only at ecosystem level (soil loss, hydrological disturbance, seed bank removal) but also at landscape level. If wildlife, particularly at low trophic levels, would be threatened by the reduction of contact surface with agroecosystems high productivity, also traditional farming landscape processes, such as small ruminants shepherding, could be threatened by the lack of open fields needed to access remote areas of forage (such as farthest meadows and fallow fields) and sheltering. Landscape evaluation level might be introduced in future CAP issues, in order to preserve these kind of ecological dynamics and to get engaged, in fact, with futures developments towards a multifunctional rural landscape.

References
