

What drives silvopastoral management in mid-Mediterranean mountain areas? Addressing opportunities, synergies and barriers of forest owners and livestock farmers for joint silvopastoral management

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Abstract
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Abstract

Silvopastoral management has a long tradition in Mediterranean forests where multifunctional management led forage for livestock grazing and not wood to be the main product obtain from these forests (Fabbio et al. 2003). Historical evidence shows however how livestock grazing was banned from forest areas due to a number of reasons (e.g. afforestations that would impede local farmers' use to secure tree establishment) and conflicts between forest owners (either public or private) and livestock grazers are recorded (Vadell et al. 2016).

However, in a context of land abandonment and increased risk of wildfires, recovering silvopastoral practices may provide synergic scenarios for forest owners/managers and livestock farmers. Silvopastoral management may require from concerted action between forest owners (either public or private) and extensive livestock farmers.

This study presents the results of explorative face-to-face survey where close-ended interviews were undertaken to a sample of forest owners and extensive livestock farmers in two Spanish regions, Aragón and Catalonia, located in the northeastern part of the country.

The typologies of forest owners and livestock farmers in these two regions were previously devised based on expert assessment in each of the regions (Perrot 1990), so that selected individuals would represent the broad diversity of forest property and livestock farming in each of these regions.

Close-ended questionnaires were designed to separately characterize the type of forest ownership and livestock farming. Common questions addressing silvopastoral dimensions were included considering likert scales to assess the views of sampled individuals on silvopastoral management and to explore conflicts between forestry and livestock farming.

9 and 10 extensive livestock farmers were interviewed respectively in Aragón and Catalonia while 10 and 10 forest owners/managers were interviewed in each of the areas, respectively.

Due to the size of the samples, non-parametric approaches were employed. We employed Mann-Whitney U tests to assess whether significant structural differences exist between case study areas. We

assessed the influence of structural factors on the attitudes of the sampled individuals using Kruskal-Wallis and Mann-Whitney U tests. Finally, two-tailed Spearman correlation tests were employed to assess the relationship between management objectives and attitudes towards wood pasture grazing.

Preliminary results show the high relevance of the productive dimension for livestock grazers and high degree of agreement amongst livestock framers on the usefulness of wood pastures as a key resource for their farms. Policy measures to encourage forest grazing should acknowledge it in order to be successful.

The family heritage dimension is the main driver for forest owners to maintain their property. Their management objectives relate to improving the quality of their stands and favouring tree regeneration. The lack of profitability is the main threat signalled followed by the risk of forest fires. They all consider livestock browsing of vegetation as a key tool to reduce the risk of wildfires although initial vegetation reduction through mechanical browsing may be needed to make the work by animals more effective.

No conflicts between forest owners and farmers have been found in any of the two case study areas. Mutual benefits and synergies are identified that can be further stimulated by forest administrations.

In the Aragon case study, 40% of the forest land is public and the case study is located in the Natural Park of Cañones and Sierra de Guara. Our study reveals an abandonment process where pressure on the forest grazing resources is very low and where access to grazing areas is not an issue since the number of farms is decreasing. The grazing intensity is well under the carrying capacity and livestock grazers use of forest pastures is decreasing while the lack of forest management makes it increasingly difficult to access some areas due to vegetation encroachment. Still forest forage is considered by them as a valuable resource to increase self-sufficiency. Famers signal predators and wild animals as one the main risks for using forest pastures. The lack of CAP subsidies related to forest areas is not identified as a barrier for reduced use of the forest areas.

In contrast with the previous, the Catalan case study shows private forest ownership structure and a higher demand of land for farming. The provincial county is promoting agreements between forest owners and livestock farmers so that the former provide their forest pastures in exchange for biomass control by livestock browsing to reduce the risk of wildfires in their land. The fact that CAP subsidies penalize forestland, reduced its demand and makes it an affordable option for landless extensive farmers, some of them young ones for whom access to the land remains a key barrier. Therefore, there is a high interest in accessing wood pastures, being the main limiting factors the lack of water, high tree density or distance from farm.

Despite our study addresses a small sample, its explorative character amongst the diversity of farms and forest owners unveils the role that silvopastoral management may play and what research, management and policy directions should be pursued if this joint management is intended to be enhanced by regional authorities.

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