

The sustainability of sheep farming systems in a High Natural Value area. Evaluation of adaptation strategies to the agricultural policies and the implications on the environmental function

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Resumen

The sustainability of mountain sheep farming systems depends on economic, social and environmental aspects. Nowadays, given its multifunctional character, besides the productive function the environmental function is considered priority in these systems, especially in the context of agro-ecosystems and in areas of high environmental quality. On the other hand, the agricultural policies that affect the sheep activities are increasingly developed from the multifunctionality perspective.

The objectives of this study are: to analyse, over the period 1990-2005, the trends of labour and livestock productivities' indicators in Spanish regional representative's sheep farming systems; to analyse and assess the sustainability of representatives farms using the Sierra y Cañones de Guara Natural Park (SCGNP); to establish optimisation models of the SCGNP sheep farming systems, for assessing possible adaptation strategies to the agricultural policies that affect them and to approach of some environmental practices value of these systems.

To achieve the objectives in this study, based on information from The Farm Accountancy Data Network (FADN), the evolution of various indices of the partial productivity of factors as labour and livestock (live capital) in Spanish regional sheep farming systems have been developed and analysed. For the analysis and evaluation of the sustainability of sheep systems that use SCGNP, located in the central area of the Huesca province (Spain), various indicators of economic, social and environmental issues has developed, according to the SAFE method. Also, on these farms indicators of attributes for assess the sustainability by MESMIS methodology has been calculated. Subsequently, an optimization model using mixed linear programming for four farms representing four types of sheep farming systems in the SCGNP has developed, and various scenarios for agricultural policies changes that affect the systems and prioritization of some of its environmental function aspects has simulated. The results indicate that in the considered period: the labor productivity in most Spanish sheepmeat farming systems has declined.

The sheep farms whose have a large size, big herds and high availability of grazing areas; they have great economic and social sustainability. While the sheep farms with smaller size, some importance of agricultural crops, mainly barley, with smaller herds, also have a high social sustainability. Regarding the attributes of the sustainability of the studied systems, the smallest size sheep farms, whose surface is located mainly in the protected area of the Park, with cereal production orientation and with small size of herds, has high values of productivity and stability. However, sheep farms of small size, located entirely within the park and have small size of herds, showed the highest adaptability of all studied systems, although, those are with less stability.

The modelling of sheep farming systems in the SCGNP, in the considered conditions, has shown that in the current scenario, with the partial decoupling of premiums and non limiting of agricultural products sale, the barley is very interesting for farms modelled, in some cases assuming the reduction the herd size. The absence of subsidies involves a substantial reduction in the economic performance of sheep models, also in the labour productivity and economic efficiency, so that could lead to abandonment of livestock activity. In a prioritization of the role of grazing scenario, also the economic performance obtained are reduced, although this reduction is less marked in the sheep farming model of high dimension and less cereal production orientation. That means, this sheep system would be which should receive less compensation for performing this function.