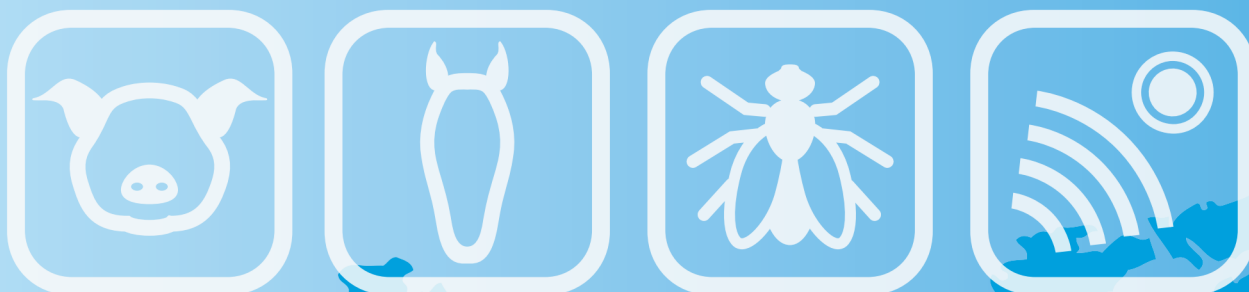


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Carbon stocks and milk yields in silvopastoral systems in the Andean Amazon region of Colombia

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It is necessary to understand how dairy farms could maintain adequate yields and carbon stocks simultaneously. We investigated technological factors, yield, and carbon stocks in Silvopastoral Systems (SPS) in the Sibundoy Valey, Andean Amazon region in Colombia. 10 farms with high, 10 medium, and 10 low SPS coverage were characterized. Technological factors were assessed on a scale from 0 to 26 adoption points. Milk yields were determined and corrected for fat and protein contents. Total carbon stock was determined aboveground (trees, leaf litter, and coarse deadwood) and belowground (roots and soil 0-20 cm deep) segments. The area of SPS on farms ranged between 2.7 ha (27%), 0.6 ha (6.0%), and 0.1 ha (1.1%) in high, medium, and low SPS coverage, respectively. Technological developments ranged from 11.70±0.83 to 14.27±0.96, and milk yields ranged from 3118.4±184.4 to 3694.2±241.3 kgFPCM·cow⁻¹, without significant differences. Carbon stocks in aboveground biomass were higher (p>0.05) in farms with high coverage (168.7±36.6 MgC) compared to those with medium (40.4±6.2 MgC) and low coverage (12.3±3.1 MgC). In all cases, between 50% and 80% of the carbon stored at the farm level was found in live fences (LF) of *Eucalyptus globulus*. Total carbon storage in SPS ranged widely from 194.5±13.8 MgC·ha⁻¹ in LF of *E. globulus* to 73.2±8.6 MgC·ha⁻¹ in open pastures and 65.8±4.4 MgC·ha⁻¹ in LF of *Alnus acuminata*. Carbon stocks did not interfere with production performance in farms with intermediate technological levels.

Coupled evolution of land cover and extensive livestock in the Spanish Pyrenees

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Land abandonment and the decline of extensive livestock farming threaten the provision of ecosystem services in mountain areas. In recent decades, while extensive livestock farming has been sharply reduced, mountain areas traditionally covered by pastures and meadows have been replaced by shrub and forest areas, i.e. revegetation. Both processes are linked, and the Pyrenees constitute an example of it. The coupled evolution of revegetation and livestock farming has been studied in specific valleys, but broader studies are needed to analyse the joint evolution of livestock and land use. Our research contributes to fill this gap by studying the central Spanish Pyrenees using Geographical Information System approaches. Data were obtained from (1) regional livestock databases, from which we selected 895 sheep and 407 cattle farms, and (2) the CORINE land cover database, from which we selected 82 municipalities covering 1161976 hectares. We analysed three time periods (2007, 2012 and 2018) using QGIS software. We found that livestock units decreased by 9%, while pastures decreased by 45% and forests increased by 26%. Thus, our results indicate that livestock and land cover trends are coupled. Land cover change varies between locations, but some common patterns can be found across the region. This research highlights the role of extensive livestock in shaping mountain landscapes and the implications of its decline.