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Sustainable meat and milk production from grasslands

Edited by

B. Horan
D. Hennessy
M. O'Donovan
E. Kennedy
B. McCarthy
J.A. Finn
B. O'Brien



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Sustainable meat and milk production from grasslands

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Designing economic instruments to maintain and enhance hay meadow biodiversity in south-west European mountain areas

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Abstract

Hay meadows are disappearing all over Europe, and with them, areas of high biodiversity. Recently, this process has also affected significant surfaces of mesophile hay meadows in south-west European (SW-EU) mountain areas, due to changes in land management and socio-demographic decline. Specific agri-environmental subsidies are one of the potential instruments to favour their conservation, but they are not applied to most of these territories. This study aims to analyse how current agricultural payment schemes from CAP and Rural Development Programmes (hereinafter RDP) can be used to enhance biodiversity conservation by promoting the maintenance/recovery of the traditional extensive management of mesophile hay meadows in Natura 2000 sites within SW Europe. To reach this goal, an extensive review and characterisation of economic instruments applied to the conservation of these meadows in Europe has been carried out. A clustering and comparative analysis of their main features, transfer possibilities and implementation results have been also addressed. The study proposes strategic guidelines to design and put into practice future economic measures to conserve mesophile hay meadows in different SW-EU mountain protected areas.

Keywords: mesophile hay meadows, mountains, subsidies, conservation, south-west Europe

Introduction

After centuries of extensive stock management, hay meadows are Agri-ecosystems with a high botanical and faunistic value and importance for European rural landscapes (Dengler *et al.*, 2012). Although two types of hay meadows are catalogued as natural habitat types of Community interest (6510 and 6520) according to the European Habitat Directive, their general decline (Keenleyside *et al.*, 2014) has also already reached south-west European countries (SW-EU), where traditional management still survives in mountain areas in north-west Portugal, the Cantabrian mountain range and the Pyrenees. Intensification of hay meadows, reconversion into developed parcels, grasslands, or simply, their abandonment is very quick in these areas (García Manteca *et al.*, 2017). Most of the sw-EU mountain areas where these meadows are located currently lack specific subsidies for their conservation and sustainable management, or the existing subsidies are ineffective. This study aims to analyse how current agricultural payment schemes are being applied and designed in Europe to enhance biodiversity conservation by promoting the maintenance of hay meadows, in order to propose transfer patterns to mountain mesophile hay meadows in Natura 2000 areas within SW-EU.

Materials and methods

In 2016 and 2017, subsidies from CAP, RDPs and other EU instruments to maintain/recover hay meadows and their traditional extensive management have been compiled and analysed. For SW-EU

(Spain, Portugal and France), the information was taken from the national and regional RDPs and CAP measures in the 2007-2013 and 2015-2020 programming periods. Technical documents on the application and assessment of measurements provided by governments and other territorial agents were also consulted. Information on recent initiatives of interest, related to agri-environmental subsidies to conserve hay meadows, and to European programmes such as *Results Based Agri-environmental Payments Schemes* and LIFE, was also compiled from the rest of Europe (Opermann *et al.*, 2012). All the subsidies were stored in a database and a descriptive data sheet, with specific fields to characterise them, evaluate their effectiveness and transfer possibilities. Subsidies were classified into three main groups, designed to tackle the problem of hay meadows disappearance in a similar way. A descriptive statistical analysis of these aids was carried out to know their frequency of implementation, prevailing subcategories, distribution by regions, etc. Finally, virtues and problems of design and implementation were identified and the most common ones were outlined (per main group) to guide a potential transfer.

Results and discussion

Thirty subsidies applied in Europe since 2007 that contribute to hay meadows conservation were identified (Table 1). Eighty percent were channelled through the European RDPs (II Pillar CAP) and 57% applied in SW-EU (France, Spain and Portugal). In total, 63% of the payments are specifically earmarked for hay meadows and 33% represent other subsidies with positive indirect effects on hay meadows.

The three major payment schemes specifically applied to conserve hay meadows in Europe are linked to the II Pillar CAP and characterised by a natural-territorial heritage conservation approach and a flexible local-regional design to capture specific environmental problems and objectives. The measures are voluntary and applied at parcel scale throughout Agri-environment-climate measures (M10 code according to CAP nomenclature) of the RDPs. The ‘classical’ design (subsidies aimed at complying with commitments for the sustainable management of hay meadows) reduces control efforts by authorities and usually reaches a broad territorial scope to preserve traditional good practices and surfaces. For the measures to be effective, commitments must be verifiable and reflect good traditional extensive practices according to regional customs regarding mown and grazing. The ‘results-oriented’ subsidies are earmarked to environmental priority areas in order to sustain agricultural ecosystems that favour biodiversity and habitats of interest, although they generally register high costs and complex methods to assess if environmental objectives have been indeed reached. For these to be effective, both subsidy and mechanisms for results assessment (as lists of indicator species) must be defined locally and engage the key territorial operators. Finally, compensatory payments in Natura 2000 sites (M12) are applied

Table 1. European subsidies that contribute to hay meadows conservation since 2007.

		Specific/direct, aimed at:		Indirect, aimed at:	Total
		Commitments	Biodiv. results	Commitments	
II Pillar CAP (RDPs)	M10-Agri-environment-climate	6	6	7	19
	M12-Natura 2000 & WFD	2	-	-	2
	Particular programmes ²	1	-	-	1
	M13-Areas with constraints	-	-	2	2
I Pillar CAP ¹	Coupled payments	-	-	1	1
Other	Non-EU Direct payments	-	-	1	1
	Pilot projects ³	-	4	-	4
Total		9	10	11	30

¹ Excluding greening.

² G.L.A.S. (Ireland).

³ Results Based Agri-environmental Payment Schemes (RBPAS).

when a Management Plan introduces constraints to the normal management of hay meadows, causing losses or extra costs. Outcomes indicate that the correct calculation of payments (annual sum per hectare) should contemplate costs and income losses associated with traditional extensive management, opportunity costs of maintaining the meadows (opposed to other alternatives), and 'leave space' for rewarding the environmental excellence of professional stockbreeders. Likewise, certain subsidies of I Pillar CAP (coupled payments linked to basic payment for livestock farms in mountain areas) and II Pillar (areas facing natural constraints, protection of local breeds in danger of being lost, communal mountain grasslands in extensive use, traditional irrigation systems, etc.) play indirectly an important role in hay meadows conservation. Finally, exploring changes in I Pillar is considered to be highly interesting for extensive livestock farms with a high dependence on them or located in protected areas.

Since effectiveness assessments for hay meadows conservation are not available for most of economic aids (only some French subsidies have been partially assessed before 2010), transfer guidelines are limited for the moment. Portugal and Spain lack previous experience in applying 'results-oriented' subsidies to hay meadows conservation, so pilot programmes are needed before transfer. For the 'Commitments-oriented' subsidies to be transferable to SW European mountain areas, empirical evidence previously mentioned about virtues and problems of design and implementation should be considered.

Conclusion

Thirty European subsidies applied since 2007 for the conservation of hay meadows, their natural value and traditional extensive practices have been identified and characterised. Mountain areas in Portugal, Spain and France still preserve mesophile hay meadows of an exceptional quality, but their fast disappearance requires the application of specific economic sustainability programmes whose design is based on the agri-environmental subsidies experience, aimed at complying with management commitments or at obtaining biodiversity results. Next CAP reform is a strategic opportunity to improve hay meadows maintenance support within I Pillar, especially for extensive livestock farms highly dependent on them.

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References

- Dengler J., Janisová M., Török P. and Wellstein C. (2014) Biodiversity of Palaearctic grasslands: a synthesis. *Agriculture, Ecosystems and Environment* 182. 1-14.
- García Manteca P., González Iglesias V. y García de la Fuente L. (2017) *Diagnóstico de la situación de prados de siega en el territorio SUDOE. Análisis diacrónico en el PNPE*, Unpublished report developed by INDUROT-University of Oviedo within the Interreg SUDOE Project 'SOS PRADERAS' (Tomás E. Díaz Director).
- Keenleyside C., Beaufoy G., Tucker G. and Jones G. (2014) *High Nature Value farming throughout EU-27 and its financial support under the CAP*, Report Prepared for DG Environment, Contract No ENV B.1/ETU/2012/0035, Institute for European Environmental Policy, London, 133 p.
- Opermann R., Beaufoy G. and Jones G. (Eds) (2012) *High Nature Value Farming in Europe. 35 European countries-experiences and perspectives*, Ubstadt-Weiher, Verlag regionalkultur, Germany.