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Evaluation of effectiveness of agri-environmental practices (AEP) in Catalonia: Recommendations from the European BESTMAP project

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Executive summary

This policy brief summarises the research outputs of the BESTMAP project, which investigated the impact of agri-environmental practices (AEP), an umbrella term including agri-environmental schemes and ecological focus areas (CAP 2014-2022) in Catalonia. BESTMAP provides information on farmers' motivations for adopting an AEP, on the spatial distribution and extent of AEPs, and on the impacts of AEPs on biodiversity and ecosystem services. The resulting recommendations are directed to policymakers in Catalonia, as well as to agricultural labour unions, cooperatives and environmental organisations.

Policy context

The European Common Agricultural Policy (CAP) supports the livelihood of 11 million farmers while maintaining environmental standards and good agricultural practices over half of the European Union (EU). In Spain, national, regional and local authorities, environmental and climate authorities, economic and social partners and organisations representing civil society, among others define de AEP. On the one hand, the income support and sectoral measures are considered of a national nature and have been defined in collaboration with the Autonomous Communities, such as the Department of Climate Action, Food and Rural Agenda (DACAA) of Catalonia. On the other hand, most rural development measures have a sub-national vocation and are designed by the Autonomous Communities, which have better awareness of the reality and needs of their territories. Moreover, in the definition of sub-national measures, the Autonomous Communities have provided a coordinated response to the needs identified in the national territory. The evaluation of policy instruments and their outcomes at regional and local levels is thus especially helpful for local stakeholders to inform their future decisions and develop sub-nationally-targeted solutions towards a more sustainable agriculture. This policy brief aims at suggesting recommendations to design Catalan policies for both, the next CAP funding period from 2028 onwards, and also for improvements of the current programme period 2023-2027.

Research goals

Catalonia covers an area of 32 000 km^2 in the north-eastern part of Spain, and 40% of the land is dedicated to agriculture. While the average climate is Mediterranean, the area presents a heterogeneous topography resulting in a variety of climatic zones ranging from Alpine, through continental Mediterranean, to coastal Mediterranean.

BESTMAP modelled water quality, carbon sequestration, food and fodder production and a biodiversity indicator (based on farmland birds' relative species richness) under different AEP adoption scenarios in Catalonia and for different farming system archetypes FSA.

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What types of farms adopt agri-environmental practices?

From the Land Parcel Identification System (LPIS) database, a classification of farms, the so-called farming system archetypes (FSA), was created on the basis of economic size (< 2000 EUR, small, medium, large) and production focus (P1 General cropping, P2 Horticulture, P3 Permanent crops, P4 Livestock grazing, Mixed) according to the simplified Farm Accountancy Data Network (FADN) methodology. The spatial analysis revealed that:

- The area is dominated by large economic size farms, are also influenced by climatic zones, presenting predominant general cropping (barley, wheat) in the central part of the region, significant production of grazing livestock and forage in the north, while permanent crops are mainly located in the western plains.

- Larger farms are more likely to implement AEP which include cover crop related practices such as maintaining natural vegetation between lines of permanent crops (in Catalonia double cropping cycle based on cereal and leguminous plantation is considered fodder instead of cover crop).

- Organic farming is found in all farm specializations, especially those medium to large size.

- Farms not applying any of the AEPs are in most cases of small economic size.

- General cropping farms are less likely to apply several AEP.
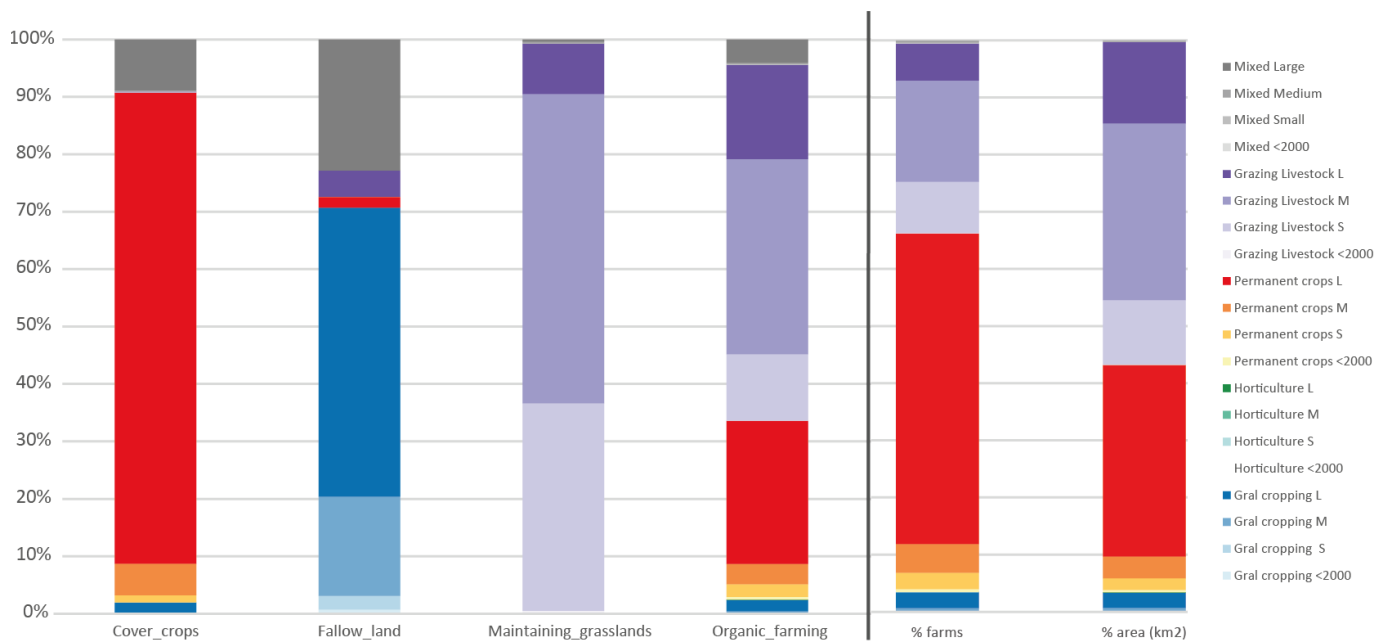
Figure 1: Use of selected agri-environmental approaches (AEPs) across different farms.

Why farmers adopt agri-environmental approaches?

Additional results based on structured farmer's interviews conducted in 2020 (47 interviews)indicate that (Bartkowski B et al. 2023):

- The main motivation for farmers to adopt an AEP is the economic compensation for lost profits and income diversification and reorientation of the business to create added value of the products and adapt to new market demands. The environmental impact of farming is a secondary reason.

- Farmers tend to apply only those practices that are consistent with their established farming practices.

- Farmers consider that there is a strong advisory system in place.

- Farmers are generally convinced of the ecological benefits of AEP, although question the specific design and effectiveness of some schemes.

According to farmers, the main obstacles to greater application of AEP are:

- AEP requirements are too different from the family traditional business model of the farm and therefore, there is more resistance towards change

- Payments are too low to transform current practices, given the risk and uncertainty regarding yield losses.

- Bureaucratic burden is currently delegated to agency or advisory bodies, but is considerable.

- Schemes are inflexible

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What is the impact of AEP on biodiversity and ecosystem services?

Outcomes from different spatially-explicit models based on both socio-economic and environmental data developed by BESTMAP, which compare the current scenario of AEP adoption and an imaginary scenario where no AEPs exist, indicate that the current levels of AEP adoption lead to improvements mainly in biodiversity and soil organic carbon (Fig. 2; D4.4). The positive effect of AEP on biodiversity is equally distributed across different farming system archetypes (Fig. 2), and the impact on specific bird species is also identified (Fig.3). Similarly, the positive changes in the soil organic carbon content are more significant for general cropping areas and livestock farms. The changes in standard output and in the export of nutrients (nitrogen and phosphorus - indicators of water quality) are positive (decrease in nutrients), albeit to a small extent.
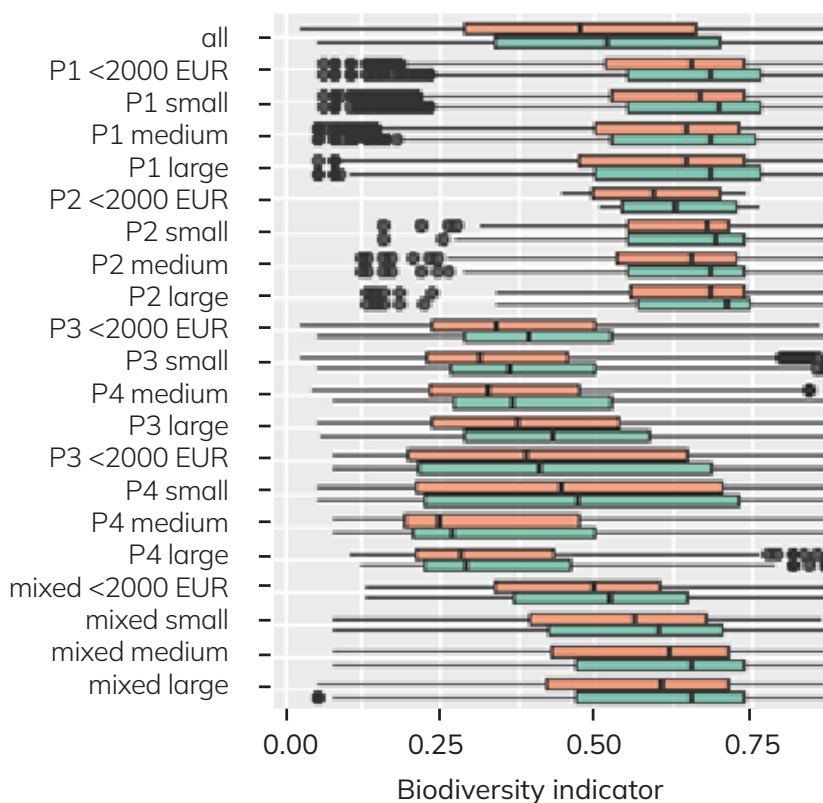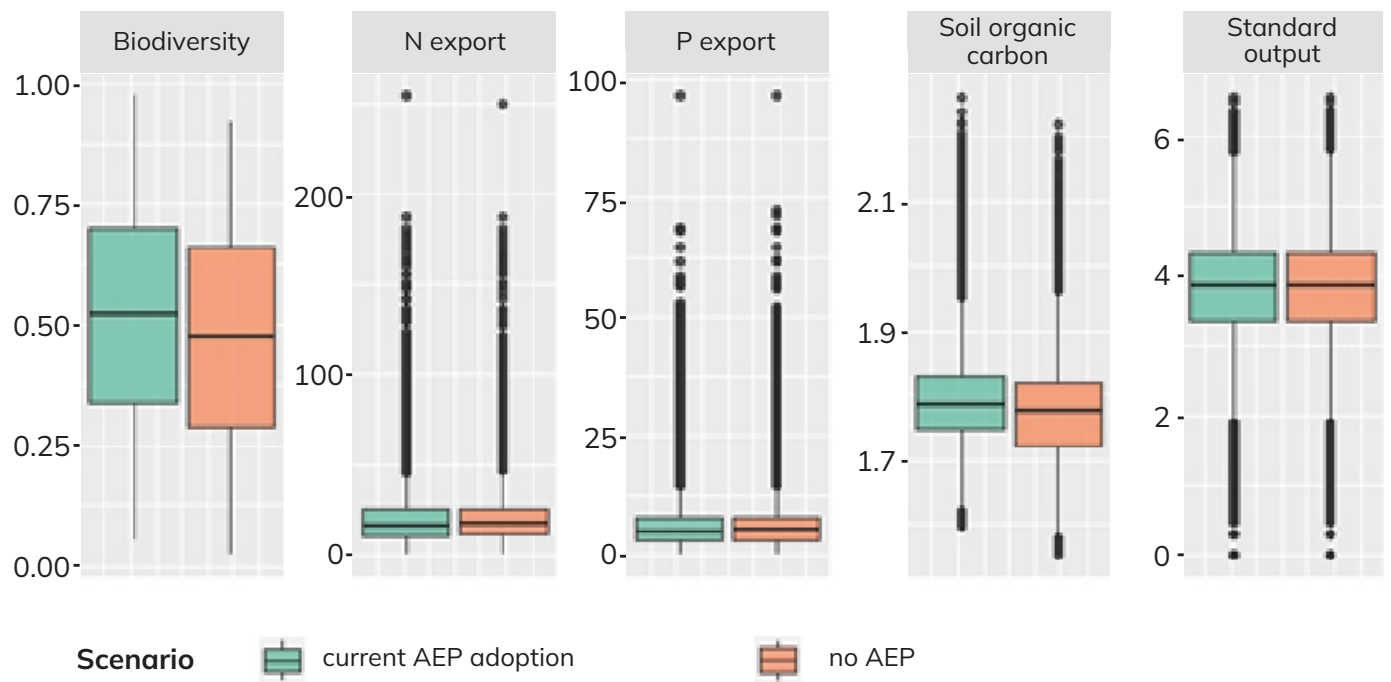
Figure 2: (Left) Comparison of farm-level values in ecosystem services' provision and biodiversity in Catalonia for the current AEP adoption scenario (green), and a scenario without AEP (orange). (Right) Value of the biodiversity indicator (a relative species richness index for farmland bird species ranging from 0 to 1) per FSA type and 2 scenarios (Farm specialization: P1 General Cropping; P2 Horticulture, P3 Permanent crops P4 Grazing Livestock, Mixed / Farm economic size: < 2000 EUR, small, medium, large).
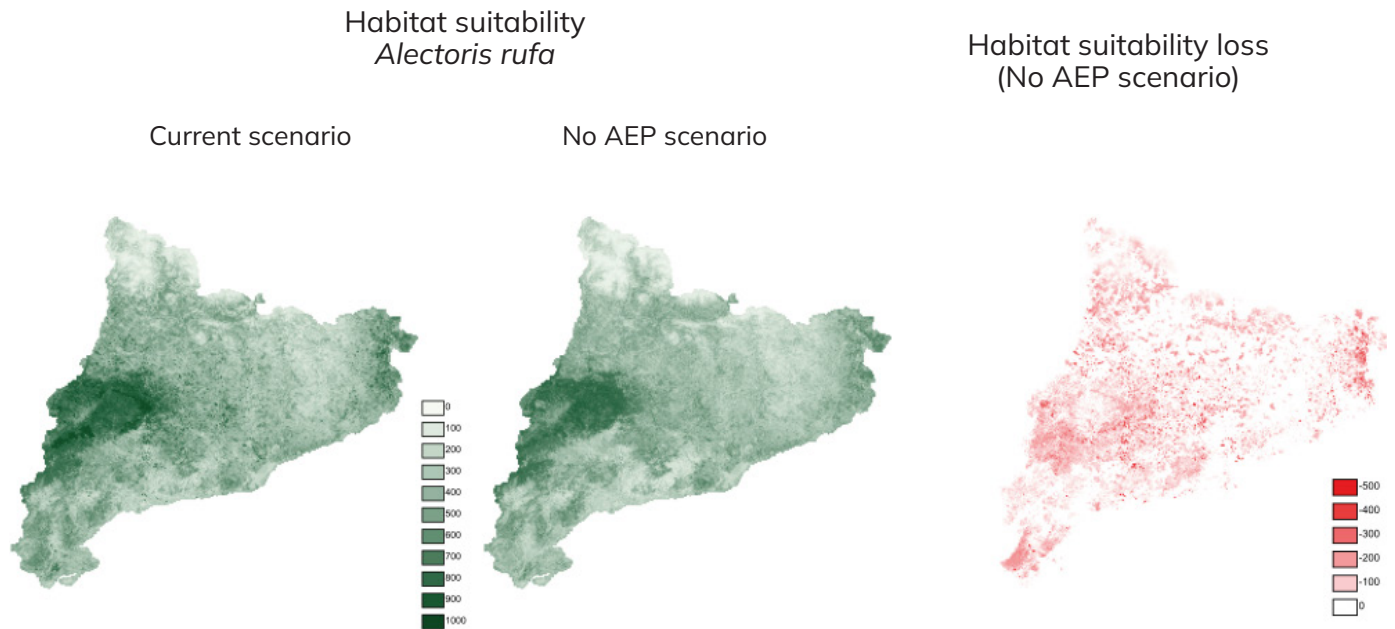
Figure 3: Modelled habitat suitability of *Alectoris rufa* (left panel; dark green indicates highly suitable areas, white indicates unsuitable areas) for the current and no AEP scenario; and habitat suitability loss (right panel, red indicates loss of habitat suitability, white indicates no change), calculated as the difference between the two scenarios.

What recommendations can be made for the future design of AEP in Catalonia?

Based on information from farmers and analyses of environmental and socio-economic data, and in order to increase the effectiveness of AEP, the following is recommended:

- Implementation of practices should be reinforced to increase the benefits, especially in small farms (e.g. these can act as barriers / connectivity corridors for biodiversity).

- More measures towards maintaining buffer strips and margins should be implemented, since these have been demonstrated as an effective measure for N/P export reduction in other case studies (D3.3).

- S**ub-regional environmental objectives to be achieved through AEP should be clearly defined.** For example, setting minimum goals for biodiversity conservation and ecosystem service provision for specific landscapes or regions is essential to determine which AEP needs to be implemented and where. Depending on the region, different environmental objectives may be prioritised.

- **Spatially distributed and tailored AEP according to environmental objectives should be implemented.** In complex landscapes with high levels of biodiversity and ecosystem services, measures should be implemented to encourage farmers to maintain, rather than to change, existing extensive land-use practices. In simple, more intensively used landscapes, AEP that require a change in farming practices to restore the level of ecological and landscape complexity should be offered.

In order to increase the uptake of AEP by farmers, we recommend the following:

- AEP requirements towards shorter or more flexible contracts and higher levels of financial support should be improved. This would work better in improving farmers' adoption rates than offering free advice and reducing bureaucracy burden.

- Transparency should be increased by clearly communicating the objectives and ecological outcomes of AEP. This can help increase farmers' willingness to participate in the AEP, whose design and ecological effectiveness are sometimes questioned by farmers.

References and additional sources of information

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