

Impact of land use change from permanent grasslands. How can policy drive land use management to provide multiple benefits to society?

Objective: To identify the impacts of land-use change and management options on the delivery of ecosystem services from permanent grasslands across Europe. The primary focus is on multi-functionality, which is defined as the capacity of land use types to provide a spectrum of public and private goods, including food, biodiversity, climate regulation, water purification and cultural values.

Methodology: A systematic literature review of the multi-functionality of permanent grasslands by assessing the effects of land-use change and various management options on 19 indicators of ecosystem services. Evidence was synthesised from relevant studies to identify synergies and trade-offs associated with specific land-use changes or management interventions.

Key Findings:

- Conversion of permanent grasslands, particularly to cropland, and intensification of management were found to decrease multi-functionality.
- Reduced management intensity was associated with positive outcomes for biodiversity, climate regulation, and water purification. However, it impacted the provision of animal feed negatively.
- Increasing the number of species in the sward and incorporating more herbs and legumes, enhanced multi-functionality without adversely affecting any of the indicators being considered.

Policy Implications:

- Increased policy support (e.g. greater subsidies; increased scrutiny of existing member state regulations and their implementation) is crucial to prevent the conversion of permanent grasslands to other land uses characterised by decreased multi-functionality and higher rents (e.g. cropland; urbanisation).
- Promoting low to medium-intensity grassland management is essential to optimise the delivery of important ecosystem services.
- Low to medium-intensity management should be context-specific and may involve ecological restoration techniques, such as sowing diverse seed mixes. A multifaceted approach, incorporating knowledge transfer, flexible policy frameworks, and alternative payment schemes for ecosystem service delivery, is necessary.
- Optimal delivery of ecosystem services depends on the local context, requiring a nuanced, region-specific policy strategy. A combined approach of protection and general extensification is proposed to secure multiple benefits from Europe's permanent grasslands.

Key Reference: Schils et al. 2022. Permanent grasslands in Europe: Land use change and intensification decrease their multi-functionality. *Agriculture, Ecosystems and Environment*; 330; 107891