Restoring healthy rivers and wetlands: How can agricultural policies support the uptake of water resilient farming practices?

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The Common Agricultural Policy (CAP) plays a pivotal role not only in shaping Europe's agricultural landscape but also in safeguarding broader environmental quality and societal well-being. At the same time, food production and rural economies depend fundamentally on healthy water systems. This Policy Working Paper illustrates how water restoration can be embedded in future agricultural policies to enhance water resilience.

Key messages

- Freshwater protection and restoration should be at the heart of EU agricultural funding, regulation, and land-use decisions.
- CAP payments must remain tied to high environmental standards to protect vital freshwater ecosystems, consistent with societal expectations and ensuring a level playing field for all land managers across the EU.
- Agricultural payments should be tightly linked to outcomes that benefit rivers, wetlands, and aquatic ecosystems. A performance-based framework is essential to ensure payments are well-targeted and impacts on freshwater are measurable.
- CAP should move beyond uniform compensatory schemes and recognize that different restoration measures affect farms in very different ways. A more strategic payment framework is needed to enable diverse farm transitions and secure lasting ecosystem benefits.
- Farmers need training and environmental services to adopt water-resilient farming, and collaborative approaches to deliver catchment and landscape scale outcomes.
- Funding to projects that degrade freshwater must be avoided, such as drainage schemes, new irrigation in over-exploited areas, or reservoirs in already water-stressed landscapes.

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Introduction

The current CAP, running until 2027, is being implemented against the backdrop of the 'Strategic Dialogue on the Future of EU Agriculture' (SDFA, 2024) and the 'Vision for Agriculture and Food' (EC, 2025a) which set out priorities for the coming years. While there has been an emphasis on environmental considerations in the last two rounds of CAP reforms (ECA, 2024), more recent discussions emphasize the competitiveness of the agricultural sector, focusing on farmers' income and position in the food value chain, regulatory simplification, greater subsidiarity and flexibility for Member States (MS), and a shift from compliance-based regulation to incentive-driven approaches (EC, 2025c). The recent proposals for the next Multi-Annual Financing Framework (MFF) closely align with new priorities (Hart & Baldock, 2025).

At the same time, in the context of the EU's water policy, the upcoming 2027 deadline for achieving the objectives of the Water Framework Directive (WFD) (EC, 2000) is fast approaching. Yet, most surface waters still fall short of reaching good ecological status, with less than 40% meeting the criteria and little improvement over the past decade (EEA, 2024). Meanwhile, the recently adopted Nature Restoration Regulation (NRR) (EC, 2024a) places emphasis on ecosystem restoration and water resilience – issues that are increasingly important in the context of climate change. The Water Resilience Strategy (EC, 2025b) further underlines the importance of water for Europe's environmental, economic, and social well-being.

This Policy Working Paper aims to reflect on the performance of the current CAP in supporting freshwater ecosystems and explore how future agriculture policy design can better integrate their restoration and maintenance. Healthy freshwater ecosystems are not only fundamental for food production but also for drinking water supply, recreational use, economic development, biodiversity, and climate adaptation. Strengthening the synergy between agricultural practices and freshwater protection is therefore essential to ensure long-term resilience and sustainability across sectors.

Why should freshwater ecosystems be restored and maintained in agricultural landscapes?

Healthy freshwater ecosystems deliver essential benefits for society at large. Functional rivers, wetlands, and floodplains play a vital role in reducing flood risks, protecting drinking water, supporting biodiversity, and offering recreational and nature-based tourism opportunities (EEA, 2020). The agricultural sector is both a major driver of freshwater degradation and highly dependent on water-related ecosystem services, making it a key stakeholder and beneficiary of restoration. Around 60% of European floodplains are under agricultural use (Entwistle et al., 2019), and agricultural activities largely contribute to habitat loss, pollution, and hydrological disruption (EEA, 2024a; Schürings et al., 2024). At the same time, farmers depend on healthy soils, stable water cycles, and a functioning landscape to maintain long-term productivity and adapt to increasing climate variability. Farmers increasingly recognise the threat from climate change and are willing to invest in nature-based solutions (Bednár et al., 2025).

Notably, even modest restoration efforts can have a substantial impact. For instance, evidence suggests that restoring less than 2% of Europe's cropland in floodplains as retention areas could reduce economic flood damage by up to 83%, and lower population exposure by 84% under a 3°C warming scenario (Dottori et al., 2023). On-farm practices such as cover cropping, reduced tillage, and diverse crop rotations enhance soil health and water retention, directly supporting yields while reducing input costs (Tamburini et al., 2020; Jones et al., 2023).

A water-resilient agricultural landscape integrates these practices at multiple spatial levels – i.e., at plot and farm, micro- and sub-catchment, and floodplain level – as described by the MERLIN Agriculture Sector Strategy (le Clech et al., 2025). These levels are important as they introduce different types of intervention. At plot and farm levels, interventions can enhance ecosystem services, such as reducing surface water runoff, or increasing soil water retention. At sub-catchment level, interventions can restore surface waterflows and freshwater ecosystems. At floodplain level, they can restore the functioning of larger rivers' floodplains, e.g. through barrier removal (le Clech et al., 2025). These different measures and their benefits are illustrated in the below MERLIN infographic (Figure 1) showing a vision for a restored rivers in their broader landscape.

A restored wetland in an agricultural landscape
(©Josselin Rouillard)

Protecting a drainage ditch with riparian buffers
(©UDE/Midjourney)

River in a peatland landscape
(©Kirsty Blackstock)

Controlling water levels in a drainage agricultural floodplain
(©Josselin Rouillard)

Low intensity agricultural grassland
(©Randolf Manderbach - www.deutschlands-natur.de)

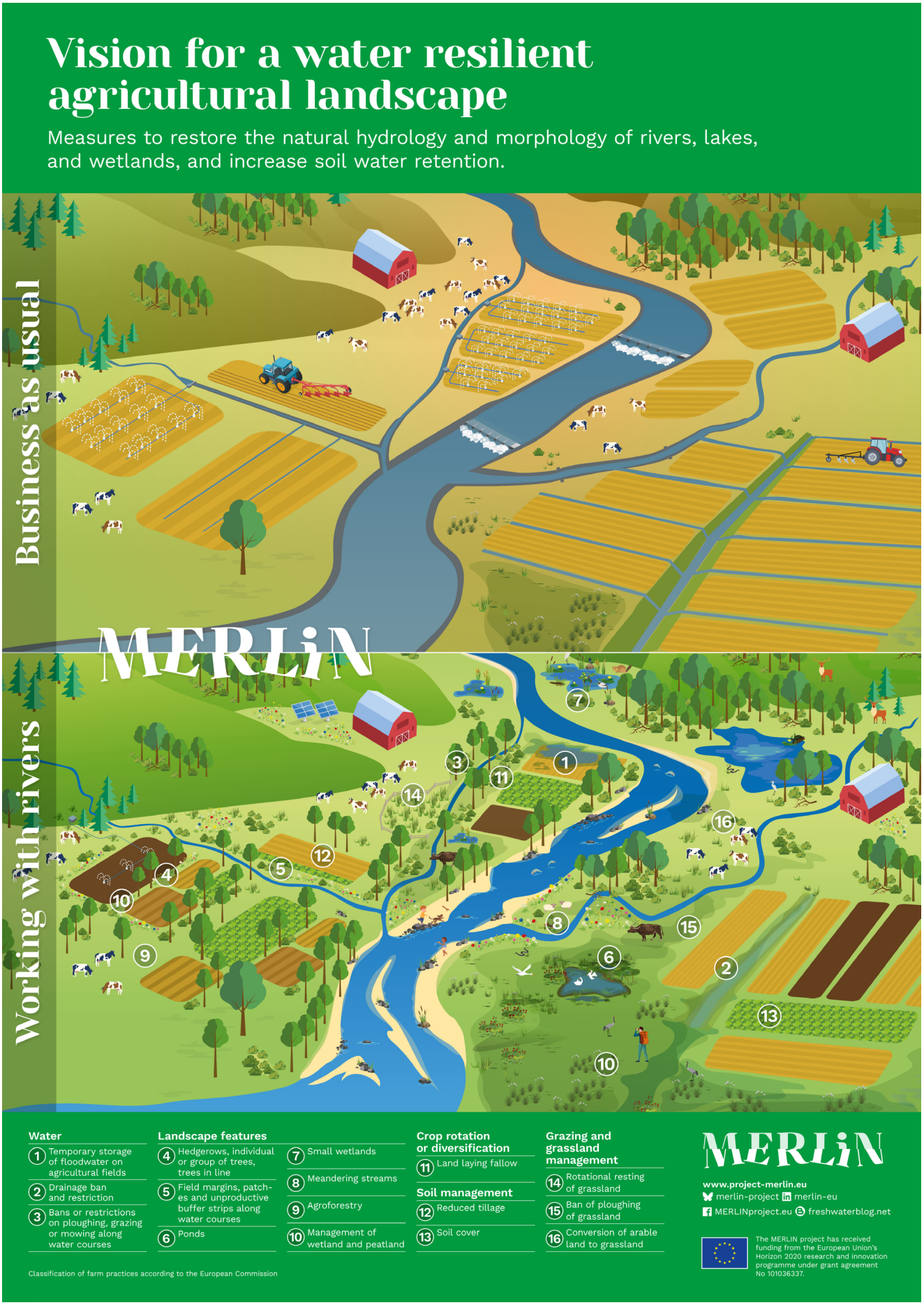

Figure 1: Vision for restored rivers in their broader landscape.

Table 1 below presents farm practices that can contribute to restoring the natural hydrology and morphology of rivers, lakes, and wetlands, and to increasing water retention in the wider agricultural landscape. These practices can be differentiated regarding their impact on farm businesses:

- Land 'sharing' measures maintain agricultural land in production whilst supporting natural processes
- Land 'sparing' measures manage land for nature without agricultural production

Differentiating these can help understand economic implications and inform appropriate responses through CAP instruments, as discussed later.

Table 1: *Farm practices that can contribute to preserve and restore rivers and wetlands*

Group of measures	Farm practice*	Impact on farming activity	Benefits for river and wetland restoration
Water	Temporary storage of floodwater on agricultural fields	Land sharing	Retention and percolation of flood water into the alluvial aquifer
	Drainage ban/restriction	Land sharing or sparing depending on whether maintain production despite restrictions	Reduction of water runoff and increase of water retention on agricultural land
	Bans or restrictions on ploughing, grazing or mowing along water courses	Land sharing or sparing depending on whether maintain production despite restrictions	Preservation of riverbanks from animal trampling and damage from nearby cultivation; Preservation of rivers from sediment erosion input from nearby fields
Landscape features	Hedgerows/individual or group of trees/trees in line	Land sparing	Reduction of water runoff and soil erosion on agricultural land and increase of water retention (and pollutants) in the agricultural landscape, thereby indirectly contributing to a more natural flow of water
	Field margins, patches and unproductive buffer strips along water courses	Land sparing	
	Ponds	Land sparing	
	Small wetlands	Land sparing	
	Streams	Land sparing	
	Agroforestry	Land sharing	
	Management of wetland/peatland	Land sparing	
Crop rotation or diversification	Land laying fallow	Land sharing or sparing depending on rotation	
Soil management	Reduced/no tillage	Land sharing	Increase of surface roughness and soil organic carbon, thereby reducing rainfall runoff and favouring landscape water retention
	Soil cover	Land sharing	
Grazing and grassland management	Rotational resting of grassland	Land sparing	Reduction of overland run off and storage of water (as compared to arable land) with most benefit arising from permanent grassland
	Ban of ploughing of grassland	Land sharing	
	Conversion of arable land to grassland	Land sharing or sparing depending on whether grassland still used for production	

*As defined by Angileri et al. (2024)

How does the current CAP support the restoration and maintenance of freshwater ecosystems?

Since its introduction in the early 1960s, the CAP has evolved to increasingly integrate environmental and climate considerations, including the protection and restoration of rivers and wetlands. The latest step in that direction was the introduction of the so-called 'Green Architecture' in the latest programming period (2023-2027). MS CAP Strategic Plans (CSPs) must outline the Green Architecture to show how they will use CAP funding to achieve environmental, climate, economic, and social objectives through tailored instruments. The CSPs therefore include detailed descriptions of the instruments' objectives, supported farming practices, eligibility and selection criteria, and relevant indicators to monitor progress in implementation, including MS-specific targets for result indicators that quantify uptake of interventions towards addressing specific environmental outcomes.

The current CAP is structured around four key instruments, each serving a different purpose and supporting different types of farming practices, as presented in Table 2. The differences in duration, coverage, and funding mechanism have implications for achieving freshwater restoration and water resilience.

Table 2: *Overview of key CAP instruments for freshwater restoration (not exhaustive)*

CAP instrument	Main purpose	Duration/coverage	Funding
Good Agricultural and Environmental Conditions (GAEC)	Ensure common minimum environmental standards that famers must comply with to receive several types of CAP support	Always applicable; mandatory for all recipients of direct payments	GAEC puts conditions on receipt of farm support payments, which are funded under European Agriculture Guarantee Fund (EAGF); fully EU-funded
Eco-schemes	Encourage short-term voluntary adoption of sustainable practices beyond mandatory requirements	Annual payments (farmers can opt in each year); compulsory for MS to offer, voluntary for farmers to participate in	European Agriculture Guarantee Fund (EAGF); fully EU-funded
Agri – Environment - Climate (ENVCLIM) interventions	Support long-term environmental improvements that require sustained efforts	Multi-year commitments (typically 5-7 years); compulsory for MS to offer, voluntary for famers to participate in	European Agriculture Fund for Rural Development (EAFRD); co-funded by national/regional authorities
Investment (INVEST) interventions	Fund structural changes and improvements in farming infrastructure (both productive and non-productive)	One-time funding for long-term projects; voluntary	EAFRD; co-funded by national/ regional authorities

In the latest round of reform, the ‚enhanced' conditionality, including Good Agricultural and Environmental Conditions (GAEC), replaced the former Cross Compliance and Greening rules, introducing stricter mandatory environmental standards that farmers must meet to receive direct payments. Conditionality represents a key instrument in the CAP as it leverages direct income support – which has the largest financial allocation – to support broad environmental care in farming practices (EC, 2019). Provisions such as the long-standing requirement to establish buffer strips along watercourses (GAEC 4) and the new requirement to protect wetlands and peatlands (GAEC 2) are particularly important for maintaining water quality and hydrological integrity.

The Polish eco-scheme "Water retention on permanent grassland" (i.e. I 4.5) promotes water retention on farmland affected by flooding. Farmers are compensated for making their land available for water storage, helping reduce carbon dioxide emissions and improve water management.

Eco-schemes are voluntary payment schemes that reward farmers who adopt practices that go beyond the mandatory requirements of conditionality. They were introduced in the last reform to significantly raise the environmental ambition of the CAP by leveraging direct payments as an incentive to farmers to adopt practices beneficial for the environment and the climate (EC, 2019). Eco-schemes are characterized by their one-year commitment period and generally simpler requirements compared to Agri-Environment-Climate Commitments (AECCs), as described below, aiming to facilitate broader participation among farmers and greater area coverage. This approach, however, entails a trade-off, as these simpler requirements tend to encourage uptake but offer limited transformative impact and environmental benefits.

In Sweden, the ENVCLIM intervention "Compensation for the management of wetlands and ponds" (i.e. VÅTMARK) supports the maintenance of constructed and rewetted wetlands. Farmers receive compensation for managing water levels, removing invasive vegetation, and preserving biodiversity, thereby improving nutrient retention capacity, natural hydrological cycles, and biodiversity.

ENVCLIM interventions combine longer existing commitments including AECCs, organic farming, and animal welfare. Compared to eco-schemes, they provide longer-term support for generally more ambitious and targeted practices, though there is considerable variation in the level of environmental ambition across interventions. While the previous CAP capped payment levels, the 2023–2027 CAP allows MS more flexibility.Although premia must still be formally based on the principle of costs incurred and income forgone, they can now be set to meet targets, allowing them to be based on the cost of the most expensive hectares rather than average costs. However, this opportunity remains underutilised by many MS (Chartier et al., 2023).

Figure 2 illustrates the number of CSPs that include at least one intervention – either via eco-schemes or ENVCLIM interventions – promoting selected farm practices beneficial for freshwater ecosystem health. Most popular are interventions aimed at improving soil health, followed by initiatives to protect riparian zones through buffer strips along watercourses, and more broadly, those safeguarding grasslands from ploughing. These are mainly 'land sharing' measures, that allow farm production to continue, with farmers benefiting from investment in their own natural capital. In contrast, few countries provide financial support to measures reducing agricultural drainage, removing embankments to allow flooding, and restoring or creating wetlands (see also Rouillard et al., forthcoming). These latter measures may require 'land sparing', and whilst there are benefits (such as replenished soils and groundwater levels) to the farmer, the benefits are often for wider society through reducing risks of floods or droughts. Regarding differences per intervention type, eco-schemes predominantly support land sharing measures, while ENVCLIM interventions include both land sharing and land sparing approaches.

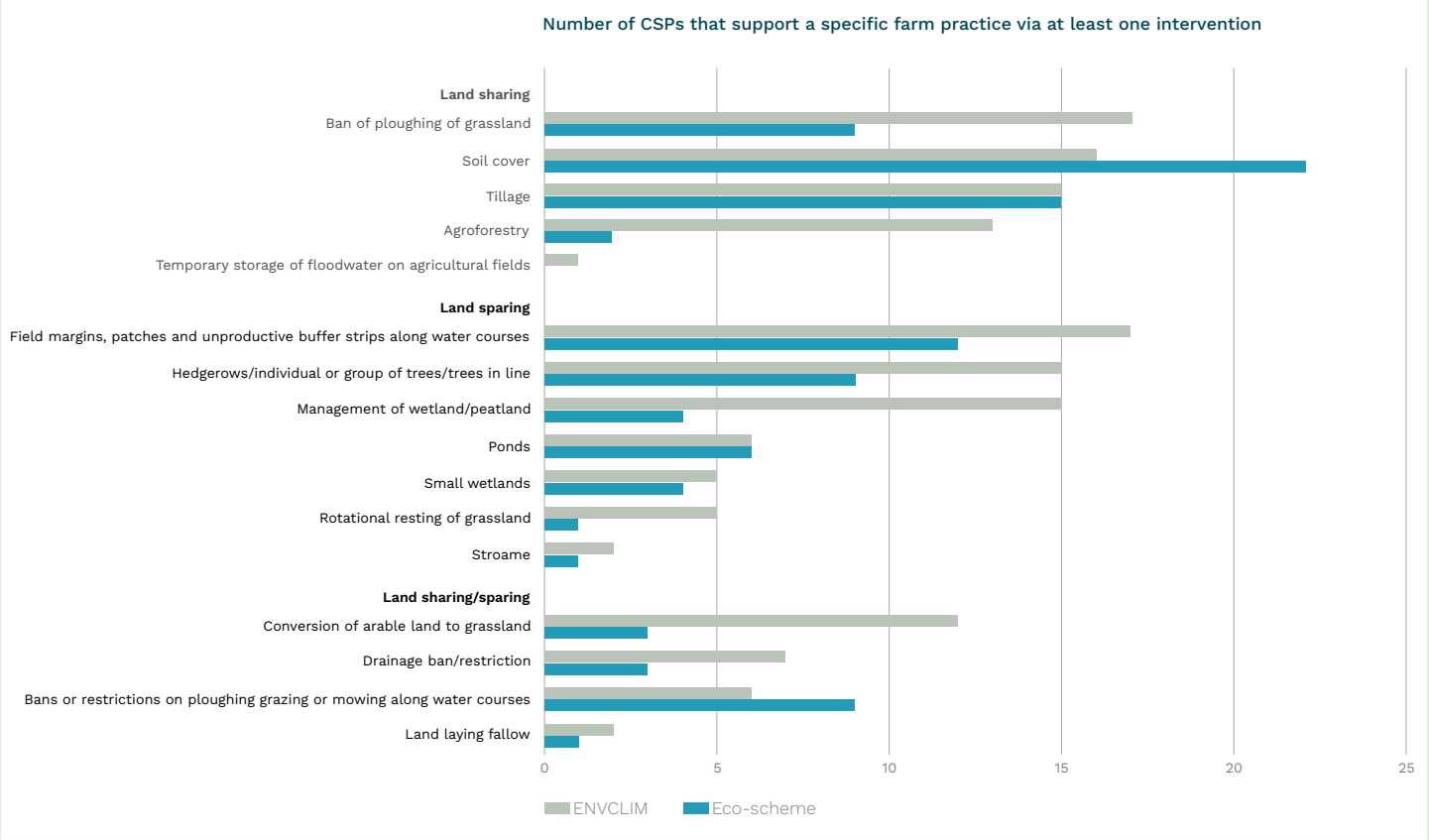

***Figure 2:** Number of CSPs that support a specific farm practice via at least one eco-scheme or ENVCLIM Intervention.*
***Note:** For land sharing/sparing, the categorisation depends on the subsequent use of land.*

The German investment intervention "Non-productive water investments" (i.e. EL-0401) aims to improve water retention in the landscape, enhance hydromorphology, and reduce surface water pollution.

INVEST interventions support capital investments in environmental and climate infrastructure. The new CAP allows up to 100% public funding for non-productive investments, such as the establishment of restoration of landscape features, peatland rewetting and habitat restoration. Investment may therefore be of use when agricultural land is brought out of production or when restoration involves significant one-off costs.

MS are free to programme other interventions, such as compensatory payments for reaching specific environmental objectives linked to the implementation of Natura 2000 protection or the WFD. Sectoral support may be relevant to support uptake of environmental measures in specific agricultural sectors like fruit and vegetables or wine. Moreover, support is available for training and skills enhancement, and for measures encouraging cooperation between farmers, food actors, and other rural stakeholders. This includes e.g., support for the European Innovation Partnership for agricultural productivity and sustainability (EIP-AGRI), which promotes innovation and knowledge exchange through operational group projects and research initiatives, many of which address water-related challenges. There are also examples of cooperation-focused interventions, such as in Ireland as described in Textbox 2 below. While such examples exist, an analysis of their design also shows their limited use by MS or their lack of tailoring to freshwater needs (Rouillard et al., forthcoming).

Overall, the current CAP is a step forward in terms of environmental and climate ambition, including support for freshwater ecosystems. However, this progress has been largely incremental and insufficient to achieve water policy objectives (ECA, 2024), especially amid increasing pressures from climate change and loss of biodiversity, habitats, and species (IPBES, 2024). In the next sections, we propose six areas of improvements, based on our observations of MS choices in the current programming period and taking into account policy discussions on the future of agricultural and food policy.

Matching ambitions with funding

With an average of EUR 55 billion per year, the overall budget of the CAP accounts for 31% of the overall Commission budget of the 2021-2027 period (Giuliani & Baron, 2025) and is significantly larger than EU funding available for nature protection and restoration (e.g., LIFE funding for 2021-2027 with EUR 5.4 billion per year). Therefore, it is critical to ensure that the budget allocation is effectively implemented to meet the full range of CAP objectives, including the green objectives relevant to freshwater restoration. Based on our calculations[1], the current share of national CAP budgets allocated to green CAP interventions[2] varies widely across MS. The EU average stands at 29.9%, with 13 MS falling below this threshold – Hungary recording the lowest allocation at 19% – while 15 MS exceed it, with Czechia reaching nearly 50%. A detailed analysis of funding options shows also that several countries stayed at or near the minimum required under the CAP Regulations[3].

Regarding freshwater restoration, existing EU tools and public data do not enable a direct assessment of MS' financial allocations to **freshwater-related objectives**. Nevertheless, available figures allow for a general estimation of priorities: approximately 35% of the eco-scheme budget and 66% of the ENVCLIM budget support area-based payments aimed at protecting water quality (i.e., linked to R21). Significantly less funding is directed at sustainable water use (i.e., linked to R23), with only 14% of the eco-scheme and 8% of the ENVCLIM budget targeting these issues (Chartier et al., 2023)[4]. This may also indicate that MS plan to address water stress through infrastructure investments, rather than changes in farm practices.

[1] Calculation of the share of green CAP instruments is based on the aggregation of national allocations to eco-schemes (2024–2028), and environmentally focused EAFRD interventions (2023–2029) including agri-environment-climate commitments (AECCs) and other green rural development actions. Combined allocations are expressed as a proportion of each MS's total CAP budget, defined as the sum of national envelopes for direct payments and EAFRD funding over the respective programming periods.

[2] The definition follows the Commission's assessment of green interventions: eco-schemes, ENVCLIM, green investments, areas with specific disadvantages (ASD), and 50% of areas with natural constraints (ANC). It could be argued that this is an overestimation, as ANC payments are not clearly linked to environmental requirements and may support agricultural practices in areas where it may be better to reduce agricultural pressure particularly on water resources.

[3] The CAP Regulation 2021/2115 requires that MS allocate at least 25% of direct payments under EAGF for eco-schemes and at least 35% of EAFRD for green interventions.

[4] Note that the Result Indicator related calculations only include eco-schemes and ENVCLIM interventions and do not track e.g., investment support, which may also deliver benefits for freshwater ecosystems.

However, infrastructure investments may help address water demand and supply issues in some cases but will not necessarily address the wider issues of stopping biodiversity decline and taking climate action (Martin et al., 2021).

Against this background, the 'Strategic Dialogue has recently concluded to the need to significantly **increase financial support to environmental and climate actions** throughout the following two CAP periods to meet the EU's environmental objectives (SDFA, 2024). It also called for an additional funding instrument in the form of an Agri-Food Transition Fund outside the CAP, dedicated to enabling a large-scale transformation of the European agricultural sector. These proposals do not appear in the recent proposals on the next MFF presented by the EU Commission (EC, 2025c). Instead, the EU may move toward a more integrated funding landscape post-2027, in which environmental and climate action is mainstreamed with sectoral, regional, and cohesion funds – with a significant risk of diluting environmental spending (Hart & Baldock, 2025). In such landscape, the establishment of **strong ringfencing mechanisms** for green spending within agricultural policies will be crucial to safeguard environmental outcomes and prevent the dilution of ecological objectives amid competing priorities.

Other avenues highlighted in the Strategic Dialogue (SDFA, 2024) as well as in the Vision (EC, 2025a) and the recent proposals of the Commission on the next MFF included attracting additional private capital to realise environmental and climate objectives. Whilst these avenues may leverage additional funding for restoration, several barriers must be overcome as explored in the MERLIN work on the role of private finance in freshwater restoration (Rouillard et al., 2025b).

Avoiding conflicting incentives

A review of MS choices in the CSPs suggests a lack of a strategic approach to restore and protect freshwater ecosystems (Chartier et al., 2023; Rouillard et al., forthcoming). Instead of leveraging synergies across instruments and interventions, the current approach often results in fragmented measures and overlapping schemes, creating complexity for farmers and reducing the overall impact[5]. At best, this leads to inefficiency, at worst, it creates conflicts between the green and non-green instruments.

Several transitional and flexibility provisions were introduced during the legislative process. For instance, MS were allowed to postpone implementation of GAEC 2 on the protection of wetlands and peatlands, and many have taken advantage of this option (Nemcová & Caiati, 2022). With increased subsidiarity, MS had greater flexibility to tailor policies to their specific regional conditions. This approach has, in practice, led to significant disparities in environmental obligations and incentives across the EU, and overall, did not lead to significant increases in environmental ambition (ECA, 2024).

This trend was further reinforced by Russia's invasion of Ukraine, which shifted political priorities toward food security, and by widespread farmer protests across several MS. In response, GAECs have now been weakened with the two rounds of simplification packages, effectively rolling back key environmental provisions of the CAP. These included the relaxation of several GAEC standards. Most notably, the obligation to maintain a minimum share of unproductive areas and features under GAEC 8 was removed and replaced by the requirement for MS to offer a corresponding eco-scheme (EP, 2024). More recently, elements of GAEC 2 from the baseline for eco-schemes and AECCs were removed, allowing MS to compensate farmers for maintaining wetlands and peatlands. Additionally, GAEC 4 was modified to allow greater flexibility in defining watercourses (EC, 2025d).

The erosion of the GAEC framework – possibly further implemented in the next MFF (Hart & Baldock, 2025) – is a major challenge. Maintaining ambitious conditionality requirements is crucial, as they provide a mandatory baseline for protecting wetland, peatlands, and freshwater ecosystems which voluntary interventions cannot replace but should build upon. This calls therefore for **more ambitious implementation of conditionality** instead of their removal. For instance, GAEC 2 would benefit from integrating strict protection requirements (e.g., no drainage, ploughing or conversion of wetlands, restrictions on ploughing and machinery use on peatlands), while GAEC 4 could be strengthened through wider buffer strips, preventing ploughing or tilling

[5] See results from the Thematic Group on Green Architecture: Designing Green Strategies | EU CAP Network

to fully recreate woody riparian vegetation, and importantly preventing exemptions or a restricted definition of watercourses on which the GAEC applies.

In addition, certain investment subsidies and sectoral aid can inadvertently undermine water protection objectives. To avoid conflicting incentives, non-green interventions should include **ambitious environmental performance standards**. Current CSPs provide limited funds to promote low water demanding cropping systems and while there is considerable support for soil health, related measures are seldomly targeted at strategically enhancing natural water retention to increase landscape water resilience. In CSPs, water stress is mostly addressed through productive irrigation investments that may perpetuate abstraction pressure and water-intensive cropping systems in water-stressed areas. The requirement to save water when investing in irrigation[6] is an indispensable mechanism, however, it currently applies only to improvements of existing installations and infrastructure in areas where water bodies are under stress. Expanding this obligation to also cover water bodies at risk of future stress and tightening water-saving requirements would strengthen the regulation. Moreover, particular care should be given to the expansion of irrigation, the construction of reservoirs, and to drainage schemes and operations – especially in regions where water bodies are already under stress or are projected to face increasing pressure as a result of reduced water availability due to climate change.

The proposed redesign of EU budget aims to increase national discretion over spending (EC, 2025c). This may increase flexibility but also risks blurring accountability and leading to uneven implementation across MS. To prevent environmental backsliding, it is critical to maintain common minimum standards and a coherent intervention framework.

Textbox 1. Design of the French eco-scheme

France has one holistic eco-scheme (31.01) that supports farmers in their transition to more sustainable practices and rewards them through market-based mechanisms. The scheme provides a flat-rate payment per eligible hectare and farmers can choose from three non-cumulative access routes:

- The Environmental Certification route allows farms with an organic certification or high-level environmental certification under the renovated High Environmental Value scheme to obtain automatic eco-scheme payment. The organic and High Environmental Value certification include many dimensions that will be beneficial for water management, regarding use of synthetic fertilisers, chemical pesticides, as well as criteria on efficient irrigation, monitoring, and reduced abstraction.
- The Practices route requires agro-ecological practices across the entire farm, including permanent grassland maintenance, crop diversification in arable settings, and inter-row vegetation cover in orchards and permanent crops. These practices are not specifically water-focused but offer co-benefits such as improved infiltration, reduced runoff, and erosion control.
- The Biodiversity Elements route rewards the presence of agro-ecological features such as hedgerows, ponds, and buffer strips, some of which help protect water quality and regulate flows through temporary water retention and runoff filtration.

Yet, concerns remain about the low environmental ambition of these routes, as many criteria can be met without meaningful changes in practice. Furthermore, protection of freshwater ecosystems is a co-benefit, yet not the central focus of the scheme. This illustrates that while the equivalence mechanism has potential for freshwater restoration, careful attention to the how the specific requirements can meet the ambition is needed.

Rewarding better the adoption of measures at farm level

CAP funding still focuses on compensating for the uptake of farm practices, rather than recognising and actively rewarding existing positive contributions to ecosystem services (Baldock & Bradley, 2023; SDFA, 2024). The Strategic Dialogue has underscored the need for the CAP to take on a **stronger role in delivering public goods**, particularly through better incentives and rewards for farmers who contribute to biodiversity conservation and water protection (SDFA, 2024). However, not all freshwater restoration measures require the same type of financial support.

Some restoration measures, such as those that optimise the use of synthetic fertilizers and pesticides or encourage more efficient water use, do not require any changes in land use (land sharing). Others, such as creating small scale features along fields (e.g., buffer strips, hedgerows) are land sparing. These can result in minor production losses in the short term but can increase productivity in the long run by improving water retention, soil health, and agro-ecosystem resilience (Moret-Bailly & Muro, 2024; OIEAU, 2024).

[6] Article 74 of CAP regulation 2021/2115 requires that investments in irrigation result in effective water savings and are subject to prior assessment to ensure compliance with the WFD and avoid negative impacts on water bodies.

Given both land sharing and some land sparing practices can improve productivity overall, instead of maintaining compensatory payments indefinitely, adoption of such **agroecological measures should be better supported through loans and/or through market-based mechanisms**, such as environmental certifications[7] or protected geographical indications that require restorative agriculture[8]. Certification schemes would improve farmers access to more favourable market conditions, especially if actively supported by cooperatives and food value chain actors.

To encourage this transition, agricultural policy funding could establish an 'equivalence' mechanism ensuring automatic compliance of certified farms with conditionality or the lower tiers of environmental payments to reduce bureaucracy for the farm business (Pekdemir, 2018). Some countries, such as France, have opted for an access route to eco-scheme payments, which includes various criteria relevant to water management (see Textbox 1). Compensatory payments would therefore be of transitionary nature and more effectively integrated with the range of market mechanisms that better reward agroecological farm production.Better market conditions for production systems adopting 'win-win' measures could free CAP resources for some of the most ambitious freshwater restoration measures, such as large-scale wetland restoration or the rewetting of peatlands. These involve fundamental changes to land use and can result in reductions in agricultural production, therefore requiring compensation for delivering societal benefits.

To support farmers in undertaking major changes in land use, it is essential to adopt longer term CAP support schemes. These should combine investment in the (re)creation and management of non-productive features – such as wetland and other unproductive landscape features – and area payments, bringing security of funding for farmers during transition of their farm practices.

CAP investment support and area payments could be designed to support the transition in floodplain, wetland, and peatland areas. For instance, some MS, such as Germany and Latvia, have started to support the adoption of paludiculture (e.g., horticulture, biofuels or pharmaceuticals/health products) to help with peatland restoration.

To secure long term funding, alternative revenue streams are necessary to compensate for lost income. Currently, result-based schemes can be designed in the CAP, although few MS have yet opted for that route, especially regarding payments for freshwater restoration (EC, 2024b). Moreover, even these schemes are typically based on costs incurred or income foregone, rather than offering genuine performance incentives. To date, only one MS, namely Ireland, included a criterion relevant to water management in its reward based ENVCLIM intervention (see Textbox 2). While CAP result-based schemes are relevant, they are dependent on the short funding cycle of the CAP, which mismatches the long-term impact of major land use change associated with some freshwater restoration measures, such as rewetting wetlands and peatlands.

Textbox 2. Irish ENVCLIM intervention

Ireland's ENVCLIM intervention (AECMCP70) stands out as one of the few genuinely reward-based schemes targeting freshwater restoration. It is designed to deliver environmental outcomes at landscape and catchment scale, with a strong emphasis on water quality improvement. Participating farmers receive payments that are partially results-based, using scorecards to assess progress toward environmental goals, including reduced nutrient runoff and improved ecological status of water bodies. The measure is implemented in high-priority geographic areas, such as those identified in Ireland's River Basin Management Plans, and is aligned with the objectives of the Water Framework Directive. By rewarding measurable improvements rather than just measuring management actions, Ireland's AECM sets a precedent for how the CAP can more effectively support ecosystem service delivery, especially in the context of freshwater protection and restoration.

Moreover, the intervention cooperation option amplifies its impact by fostering collective action among farmers and land managers within the high-priority areas. Rather than approaching farms as isolated units, it facilitates coordinated efforts to address environmental challenges at landscape scale. This collective model is supported by locally based project teams who play a key role in planning and implementation by helping to identify regional priorities related to biodiversity, water, and climate, and work with farmers to set objectives and develop strategies to address them. As part of the process, farmers are required to submit a Farm Sustainability Plan aligned with the overarching action plan of the Cooperation Project. By anchoring the intervention in locally defined priorities, the cooperation option enhances both the relevance and the impact of the measure.

[7] For example, Unilever Sustainable Agricultural Code requires efficient water use, irrigation planning, drainage management to protect water quality or various organic certification processes; or the EU Organic Regulation (2081/848) that also requires regenerative practices that support freshwater ecosystems.

[8] For example, the BioLand ecolabel, see Chen et al. (2024).

These land sparing practices require ongoing maintenance, which are often not well covered by the capital INVEST instruments. Payments offered by water utilities (e.g., Thomson et al., 2014; Vuletić et al., 2020), carbon farming arrangements under Regulation 2024/3012, or biodiversity crediting systems (BCA, 2023) may provide long-term financial incentives for land managers who contribute to freshwater restoration beyond individual CAP programming periods. However, such Payment for Ecosystems Services and ecosystem markets have drawbacks and potential high transaction costs (Reed et al., 2017) – these must be addressed before upscaling. A more streamlined approach would also be needed to facilitate a switch from CAP payments to long term non-CAP sources of funding and payment schemes.

Maximising benefits at the landscape level

Encouraging stronger and longer cooperative efforts – such as landscape-scale management initiatives (e.g., whole floodplains, catchments) – can help achieve measurable improvements in biodiversity, water quality, and climate resilience (Pe'er et al., 2022; Hering et al., 2023). They are essential for water preservation efforts as impacts mostly arise from the cumulative pressure of farms across river catchments (OECD, 2017). However, current CAP incentives are mostly designed as individual farm-level measures (ECA, 2024), and cooperation is underdeveloped in the plans (Chartier et al., 2023). As a result, they often fail to deliver cumulative benefits at a meaningful scale, for instance by incentivising a diversity of uncoordinated and weakly targeted changes in land use management amongst several farmers active in the same catchment (Pe'er et al., 2022).

MS can propose cooperation interventions in their CSPs. However, they are currently mostly underdeveloped and not designed for landscape-wide freshwater restoration (Chartier et al., 2023). They fail to be attractive, poorly reward the collective effort, and often face operational constraints in implementation (ENRD, 2018).

One approach to incentivise landscape scale approaches is to include appropriate selection criteria that prioritise coordinated applications of farmers to rural development funds. Generally, such targeting of CAP funds would be beneficial for freshwater restoration, especially if informed by river basin and flood management planning under WFD and the Floods Directive, and other water and nature protection policies (e.g., Nature Directives, Nitrates Directive, Nature Restoration Regulation). The Irish example in Textbox 2 shows one way to integrate cooperation with agri-environment measures.

Textbox 3. The Dutch landscape scale collaborative approach

Under its ENVCLIM interventions, the Dutch Strategic Plan supports collective approaches, where certified farmer collectives act as legal entities that coordinate and implement landscape-scale management across multiple holdings. These collectives submit area-based habitat proposals, receive results-based payments per hectare, and distribute funds to their member land managers. The scheme aims to conserve biodiversity – particularly habitat for endangered species – while also addressing water and climate objectives. Specific measures contribute directly to the goals of the Water Framework and Nitrates Directives by enhancing water quality and retention through environmentally friendly management of ditches, banks, and other hydrological features across entire catchments. (Source: Reichenspurner et al., 2024)

Another approach is to support local landscape partnerships or groups who collaborate and develop schemes across multiple farm holdings. This may exist under ENVCLIM interventions (see Textbox 3), LEADER or the European Innovation Partnerships. More generally, major opportunities lie in joint projects between farmers, land managers, and municipalities – more closely linking rural and urban areas for the benefits of restoration to trickle down whole catchments and river basins. Hence, CAP synergies with other European funds, such as LIFE, Cohesion Policies, and Regional Funds, must be enhanced to leverage public funding for landscape wide ('territories') transitions. The MERLIN Agricultural Sector Strategy outlines more specific examples and recommendations (le Clech et al., 2025).

Adopting a performance-based monitoring framework

To ensure that future CAP interventions effectively support freshwater protection and restoration, better alignment between policy objectives, implementation tools, and measurable outcomes is essential. A **robust monitoring and evaluation system** that goes beyond administrative oversight to assess real-world impacts plays a critical role in identifying what works, where, and why. This is especially important for water-related measures, where ecological responses are often cumulative and spatially diffuse, and where success depends on actions across multiple farms and landscapes. At present, CAP monitoring systems provide only limited insight into the actual ecological outcomes of agricultural practices, especially regarding water quality, hydrological function, and ecosystem health. Current metrics overlook key drivers of ecological degradation and fail to capture landscape scale interactions.

To improve the CAP's environmental performance, its evaluation framework must incorporate more comprehensive indicators that reflect pressures on water and soil systems at landscape and catchment scales (ECA, 2024). Existing WFD indicators (e.g., agricultural pressures at the water body level) and EU datasets, such as the Farm Sustainability Data Network (FSDN) with a regional granularity (at best NUTS3), offer a foundation for better metrics as combined they can quantify both pressures and impacts. Yet, challenges remain with the lack of physical rather than financial quantification of metrics in FSDN (Matthews et al., 2021) and need to include more business to allow basin specific analysis (and managing issues of disclosure). Moreover, enhanced soil monitoring – via European sample archives, high-throughput indicators, and precision agriculture – would also support integrated land and water management.

Importantly, monitoring should not be designed solely for compliance. It should also support learning, transparency, and peer exchange among farmers, advisors, and administrations. For example, locally relevant monitoring, such as the results-based scorecards used in Ireland's AECM intervention (see Textbox 2), can build trust and engagement while enabling flexible, place-based responses. Similarly, landscape partnerships like those in the Netherlands (Textbox 3) require shared monitoring frameworks to coordinate efforts and reward joint outcomes.

Ultimately, improved performance tracking will help justify funding, demonstrate the added value of nature-based solutions, and direct support towards those interventions and actors that most effectively contribute to restoring healthy rivers, wetlands, and catchments.

Final remarks

The future CAP must actively strengthen the resilience of the European farming system by promoting sustainable agricultural practices and by preserving and restoring freshwater ecosystems. There is an urgent need to reduce environmental pressures and to restore ecological functions within agricultural waterscapes. This paper shows how the future CAP can do more to embed water protection across its instruments. Where water is currently addressed in the CAP, it tends to relate to water as a resource, with little recognition of the importance of freshwater ecosystems. Yet, without safeguarding ecosystem health, the services and benefits on which European agriculture relies cannot be guaranteed. Achieving true resilience and sustainability requires the CAP to adopt a more systemic understanding – one that includes water, landscape, and agroecosystem functions across spatial and temporal scales. It also calls for better integration of EU agricultural policies with the broader agri-food interface to better internalize environmental costs and align market demand with the imperative of freshwater and environmental restoration, so that consumers appreciate and reward water-friendly farming.

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Further reading

- MERLIN Agriculture Sectoral Strategy
- Rouillard, J., Meier, J., Blackstock, K. L., Matthews, K. B., & Birk, S. (Forthcoming). Does the Common Agricultural Policy 2023–2027 support the restoration of freshwater ecosystems? Nature Conservation.

References

Angileri V., Guerrero I., & Weiss F. (2024). A classification scheme based on farming practices – A tool for labelling interventions with environmental and climate related commitments in Common Agricultural Policy strategic plans. Publications Office of the European Union, Luxembourg. https://data.europa.eu/doi/10.2760/33560

Baldock, D. & Bradley, H. (2023). Transforming EU land use and the CAP: A post-2024 vision. Institute for European Environmental Policy, Brussels. https://ieep.eu/publications/transforming-eu-land-use-and-the-cap-a-post-2024-vision/

Bednár, M., Pavelková, R., Netopil, P. & Sarapatka, B., (2025). Czech farmers' perspectives on sustainable agriculture and water management: Implications for climate change adaptation. Agricultural Water Management, 313, 109470. https://doi.org/10.1016/j.agwat.2025.109470

BCA (Biodiversity Credit Alliance). (2023). Demand-side sources and motivation for biodiversity credits. Issue paper No 1. https://www.biodiversitycreditalliance.org/wp-content/uploads/2024/05/BCAIssuePaper_DemandOverview06122023-final.pdf

Chartier, O., Folkeson Lillo, C., Valli, C., Jongeneel, R., Selten, M., van Asseldonk, M., Avis, K., Rouillard, J., Underwood, E., Parissaki, M., Bertolozzi, D., & Devot, A. (2023). Mapping and analysis of CAP strategic plans - Assessment of joint efforts for 2023-2027: executive summary. Publications Office of the European Union, Luxembourg. https://data.europa.eu/doi/10.2762/12295

Chen J., Blackstock K., Ibrahim A., Scholl L., Ilgeroth-Hiadzi L., Vion-Loisel A., Nyírő F., Purre A.-H., Kuenen M., Malveira Cavalcanti V., Birk S. & Hernandez Herrero E. (2024). Value chain analysis in key economic sectors (MERLIN Deliverable 4.4, 53 pp.). EU H2020 Research and Innovation Project MERLIN. https://project-merlin.eu/deliverables/articles/deliverable-d4-4.html

Dottori, F., Mentaschi, L., Bianchi, A., Alfieri, L., & Feyen, L. (2023). Cost-effective adaptation strategies to rising river flood risk in Europe. Nature Climate Change 13(2), 196-202. https://doi.org/10.1038/s41558-022-01540-0

EC (European Commission). (2000). Consolidated text: Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. European Commission, Brussels. http://data.europa.eu/eli/dir/2000/60/2014-11-20

EC (European Commission). (2019). The Post-2020 Common Agricultural Policy: Environmental benefits and simplification. European Commission, Brussels. https://agriculture.ec.europa.eu/system/files/2021-01/cap-post-2020-environ-benefits-simplification_en_0.pdf

EC (European Commission). (2024a). Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869. European Commission, Brussels. http://data.europa.eu/eli/reg/2024/1991/oj

EC (European Commission). (2024b). Assessment of results-based interventions. European Commission, Brussels. https://eu-cap-network.ec.europa.eu/publications/assessment-results-based-interventions_en

EC (European Commission). (2025a). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A vision for agriculture and food – Shaping together an attractive farming and agri-food sector for future generations. COM/2025/75 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52025DC0075

EC (European Commission). (2025b). European Water Resilience Strategy. European Commission, Brussels. https://environment.ec.europa.eu/publications/european-water-resilience-strategy_en

EC (European Commission). (2025c). An ambitious budget for a stronger Europe: 2028-2034. European Commission, Brussels. https://ec.europa.eu/commission/presscorner/detail/en/ip_25_1847

EC (European Commission). (2025d). Simplifying farmers lives. https://commission.europa.eu/news/simplifying-farmers-lives-2025-05-14_en

ECA (European Court of Auditors). (2024). Special report 20/2024: Common Agricultural Policy Plans – Greener, but not matching the EU's ambitions for the climate and the environment. https://www.eca.europa.eu/en/publications?ref=SR-2024-20

EEA (European Environment Agency). (2020). Is Europe living within the limits of our planet? An assessment of Europe's environmental footprints in relation to planetary boundaries. EEA Report 01/2020. Publications Office of the European Union, Luxembourg. https://doi.org/10.2800/890673

EEA (European Environment Agency). (2024). Europe's state of water 2024: The need for improved water resilience. EEA Report No 07/2024. Publications Office of the European Union, Luxembourg. https://doi.org/10.2800/02236

ENRD (European Network for Rural Development Thematic Group (TG) on sustainable management of water and soils). (2018). Co-operative and multi-actor approaches to soil and water management. https://ec.europa.eu/enrd/sites/default/files/tg_water-soil_factsheet_multi-actor-approaches.pdf

Entwistle, N., Heritage, G., & Milan, D. (2019). Ecohydraulic modelling of anabranching rivers. River Research and Applications 35(4), 353-364. https://doi.org/10.1002/rra.3413

EP (European Parliament). (2024). Targeted CAP amendments on environmental conditionality, Briefing. https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2024)760414

Giuliani, A., & Baron, H. (2025). The CAP (Common Agricultural Policy): A short history of crises and major transformations of European agriculture. Forum for Social Economics, 54(1), 68–94. https://doi.org/10.1080/07360932.2023.2259618

Hart, K., & Baldock, D. (2025). The post-2027 CAP and MFF proposals for the EU: first reflections on their environmental implications. Institute for European Environmental Policy, Brussels. https://ieep.eu/publications/the-post-2027-cap-and-mff-proposals-for-the-eu-first-reflections-on-their-environmental-implications/

Hering, D., Schürings, C., Wenskus, F., Blackstock, K., Borja, A., Birk, S., Bullock, C., Carvalho, L., Bou Dagher-Kharrat, M., Lakner, S., Lovrić, N., McGuinness, S., Nabuurs, G.-J., Sánchez-Arcilla, A., Settele, J., & Pe'er, G. (2023). Securing success for the Nature Restoration Law. Science, 382(6667), 1248-1250. https://doi.org/10.1126/science.adk1658

IPBES (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services). (2024). Thematic Assessment Report on the Interlinkages among Biodiversity, Water, Food and Health. IPBES, Bonn, Germany. https://zenodo.org/records/13850289Jones, SK, Sánchez, AC, Beillouin, D, Juventia, SD, Mosnier, A, Remans, R., & Estrada Carmona, N. (2023). Achieving win-win outcomes for biodiversity and yield through diversified farming. Basic and Applied Ecology, 67, 14-31. https://doi.org/10.1016/j.baae.2022.12.005

le Clech, S., Hernandez Herrero, E., Gelencsér, G., Rouillard, R., Ilgeroth-Hiadzi, L., Moog L., Matthews, K., Sugiura, Y., & Aitner-Óváry, M. (2025). Agriculture sectoral strategy: Gaining resilience through Nature-based Solutions (MERLIN Deliverable 4.5, 60 pp.). EU H2020 Research and Innovation Project MERLIN. https://project-merlin.eu/outcomes/sectoral-activity/agriculture.html

Martin, J. G., Scolobig, A., Linnerooth-Bayer, J., Liu, W., & Balsiger, J. (2021). Catalyzing innovation: Governance enablers of Nature-based Solutions. Sustainability, 13(4), 1971. https://doi.org/10.3390/su13041971

Matthews, K. B., Renner, A., Blackstock, K. L., Waylen, K. A., Miller, D. G., Wardell-Johnson, D. H., Juarez-Bourke, A., Cadillo-Benalcazar, J., Schyns, J. F., & Giampietro, M. (2021). Old wine in new bottles: Exploiting data from the EU's Farm Accountancy Data Network for Pan-EU sustainability assessments of agricultural production systems. Sustainability, 13(18), 10080. https://doi.org/10.3390/su131810080

Moret-Bailly, S., & Muro, M. (2024). The costs and benefits of transitioning to sustainable agriculture in the EU: A synthesis of existing knowledge. Institute for European Environmental Policy, Brussels. https://ieep.eu/publications/the-costs-and-benefits-of-transitioning-to-sustainable-agriculture-in-the-eu-a-synthesis-of-existing-knowledge/

Nemcová, T., & Caiati, S. (2022). Peatlands and wetlands in the new CAP: Too little action to protect and restore. BirdLife Europe & European Environmental Bureau. https://www.birdlife.org/wp-content/uploads/2022/04/Analysis-Peatlands-Wetlands-CAP-strategic-plans-April2022.pdf

OECD (2017). Diffuse Pollution, degraded waters – Emerging policy solutions. OECD Studies on Water. OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264269064-en

OIEAU (International Office for Water). (2024). European NWRM+ platform. https://www.nwrm.eu/

Pe'er, G., Finn, J. A., Díaz, M., Birkenstock, M., Lakner, S., Röder, N., Kazakova, Y., Šumrada, T., Bezák, P., Concepción, E. D., Dänhardt, J., Morales, M. B., Rac, I., Špulerová, J., Schindler, S., Stavrinides, M., Targetti, S., Viaggi, D., Vogiatzakis, I. N., & Guyomard, H. (2022). How can the European Common Agricultural Policy help halt biodiversity loss? Recommendations by over 300 experts. Conservation Letters, 15, e12901. https://doi.org/10.1111/conl.12901

Pekdemir, C. (2018). On the regulatory potential of regional organic standards: Towards harmonization, equivalence, and trade? Global Environmental Change, 50, 289-302. https://doi.org/10.1016/j.gloenvcha.2018.04.010

Reed, M. S., K. Allen, A. Attlee, A. J. Dougill, K. L. Evans, J. O. Kenter, J. Hoy, D. McNab, S. M. Stead, C. Twyman, A. S. Scott, M. A. Smyth, L. C. Stringer and M. J. Whittingham (2017). A place-based approach to payments for ecosystem services. Global Environmental Change-Human and Policy Dimensions, 43, 92-106. https://doi.org/10.1016/j.gloenvcha.2016.12.009

Reichenspurner, M., Barghusen, R., & Matzdorf, B. (2024). Exploring farmers' perspectives on collective action: a case study on co-operation in Dutch agri-environment schemes. Journal of Environmental Planning and Management, 67(8), 1830-1851. https://doi.org/10.1080/09640568.2023.2183111

Rouillard, J., Meier, J., Blackstock, K. L., Matthews, K. B., & Birk, S. (Forthcoming). Does the Common Agricultural Policy 2023–2027 support the restoration of freshwater ecosystems? Nature Conservation.

Rouillard, J., Anzaldua, G., Meier, J., Scholl, L., Carmen, E., Waylen, K., Kok, S., Malveira Cavalcanti, V., Grondard, N., Lenz, M.-I., Demus, Y., Andrez, P., Saviak, V., & Birk, S. (2025b). Diversifying funding for freshwater restoration using Nature-Based Solutions: Lessons from the MERLIN project (MERLIN Deliverable 3.5, 55 pp.). EU H2020 Research and Innovation Project MERLIN. https://project-merlin.eu/deliverables/articles/deliverable-d3-5.html

Schürings, C., Globevnik, L., Lemm, J.U., Psomas, A., Snoj, L., Hering, D., & Birk, S. (2024). River ecological status is shaped by agricultural land use intensity across Europe. Water Research, 251, 121136. https://doi.org/10.1016/j.watres.2024.121136

SDFA (Strategic Dialogue on the Future of EU Agriculture). (2024). Strategic Dialogue on the Future of EU Agriculture: A shared prospect for farming and food in Europe. European Commission, Brussels. https://agriculture.ec.europa.eu/overview-vision-agriculture-food/main-initiatives-strategic-dialogue-future-eu-agriculture_en

Tamburini, G., Bommarco, R., Wanger, T.C., Kremen, C., Van Der Heijden, M.G., Liebman, M., & Hallin, S. (2020). Agricultural diversification promotes multiple ecosystem services without compromising yield. Science Advances, 6(45), eaba1715. https://doi.org/10.1126/sciadv.aba1715

Thomson, K., Kerle, S., Waylen, K., & Martin-Ortega, J. (2014). Water-based payment for ecosystem services (PES) schemes in Scotland. James Hutton Institute, Dundee. https://www.hutton.ac.uk/sites/default/files/files/2014%20Water%20PES%20in%20Scotland%20report.pdf

Vuletić, D., Krajter Ostoić, S., Keča, L., Avdibegović, M., Potočki, K., Posavec, S., Marković, A., & Pezdevšek Malovrh, Š. (2020). Water-related payment schemes for forest ecosystem services in selected Southeast European (SEE) countries. Forests, 11(6), 654. https://doi.org/10.3390/f11060654