

Rough estimate of the soil protection potential of the CAP Strategic Plans over the period 2023-2027

(October 2026)

The European Evaluation Helpdesk for the CAP



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Outline of the presentation

- Introduction
- Methodological approach
- Examples of results for CSP interventions
- Concluding remarks



Introduction





Objectives of the study

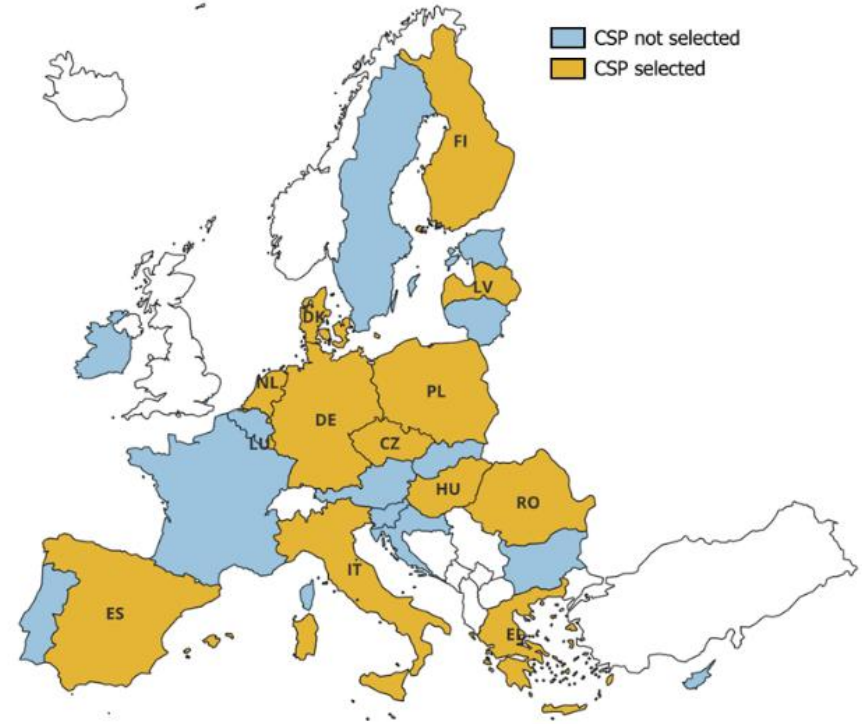
To deliver **methodological support to DG AGRI** to quantify and qualify the overall potential contribution of CAP Strategic Plans (CSPs) to soil sustainable management

- To **develop a methodology** to quantify the potential contribution of the CAP strategic plans to soil health focusing on specific soil characteristics
- To **deliver rough estimates** of the potential contribution of the CSPs 2023-2027 to soil health based on the CSP planning in 13 CSPs
- To provide Managing Authorities and other interested parties with a **quantification tool that can possibly be updated and adapted** to support their operational goals



Scope

- > **13 CAP strategic plans (CSP)** representative of EU diversity
- > **Programming data** in the CSPs as approved by the European Commission (in force on the 1st January 2025)
- > Does not account for the contribution of other policies and measures implemented in Member States beyond the CSPs.





Scope – CAP instruments expected to positively contribute to soil health

Mandatory commitments

› **GAECs: Good agricultural and environmental conditions:**

- **GAEC 1** – Maintain permanent grassland
- **GAEC 2** – Protect wetlands and peatlands
- **GAEC 4** – Buffer strips
- **GAEC 5** – Tillage management
- **GAEC 6** – Minimum soil cover
- **GAEC 7** – Crop rotation

Voluntary commitments – Interventions

› **European Agriculture Guarantee Fund**

- **Eco-scheme** – Scheme for the climate, the environment and animal welfare
- **CIS** – Coupled income support

› **European Agricultural Fund for Rural Development**

- **ENVCLIM** – Agri-environment – Climate commitment
- **INVEST** – Investments



Scope - Soil characteristics and relevant indicators

Soil organic carbon content:

Increase in organic C stock at the top 30cm

Soil nitrogen: Increase in nitrogen stock at the top 20cm

Soil Water retention capacity:

Increase in water stock at field capacity at the top 20 cm

Soil packing density: Reduction in packing density at the top 20cm

Nitrogen leaching and runoff:

Reduction in mass of nitrogen loss from leaching and runoff

Soil erosion by water: Reduction in mass of eroded soil through runoff per hectare

Methodology





Building blocks

CAP Strategic plans
(CSP) programming
data
(in force 1.1.2025)

Effect sizes of the
JRC farming
practices evidence
library

Classification (JRC)
scheme of farm
practices (FPs)

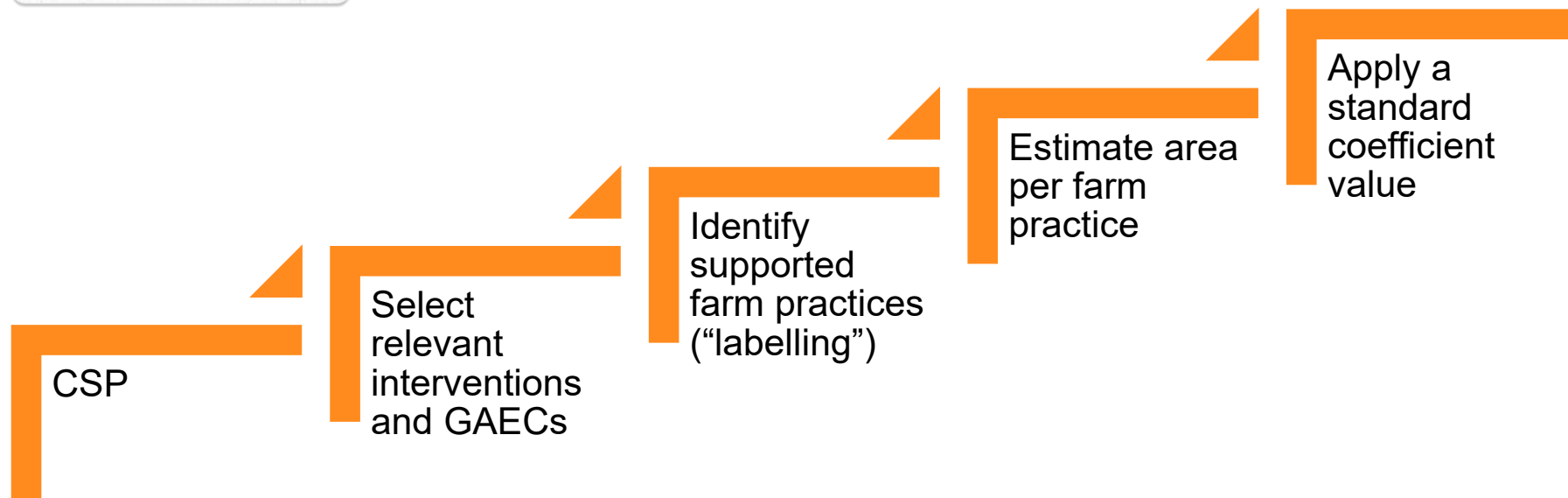
Labelling of GAECs
and interventions
with farming
practices

- Systematic review of the scientific literature of meta-analyses
- Qualitative and quantitative effect of FPs on environmental, climate, and production aspects

Description of FPs targeted /
Available on DG AGRI [online Catalogue of CAP interventions](#)



General approach



**Potential
contribution
estimated**

$$= \sum_{\text{Interventions} + \text{GAEC}} \left[\begin{array}{c} \text{Estimated area} \\ \text{per farm practice} \end{array} \times \begin{array}{c} \text{Soil coefficient} \end{array} \right]$$





Some general principles “ROUGH ESTIMATES”

1. Only direct positive contribution of CSP. Negative effects or trade-offs of practices are not considered
2. Counterfactual



- **No baseline: consider the whole area planned (include farm practices already there)**
- **Exception for GAECs: rough estimates of the additional areas covered through the new CAP programming period**

Results cannot be considered an evaluation of the impacts of the CAP. Considering that all the interventions are newly implemented is leading to an overestimation of the potential effects of CSPs on soil. Some of the areas were already under the same management in the previous programming period

4. The actual contribution of the CSP compared to the previous period depends
 - The actual uptake of CAP interventions
 - On the practices that were in place before

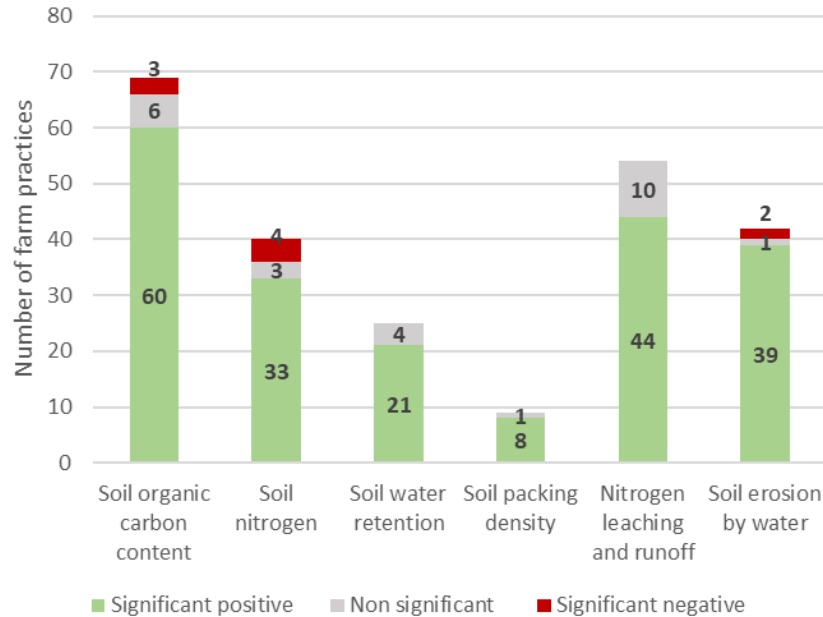


Database created, unit of the coefficients

Soil characteristic	Coefficient in relative value (A)	Baseline to turn relative values in absolute value (B)	Unit of the final coefficients used (A x B)
Soil organic carbon (SOC) content	% increase in SOC/year	Tonnes of carbon per ha – top 30cm	Increase in t of C/ha/yr – top 30 cm
Soil nitrogen	% increase in soil nitrogen/year	Tonnes of nitrogen per ha – top 20cm	Increase in t of N/ha/yr – top 20 cm
Soil water retention capacity	% increase in soil water retention capacity/year	Available water capacity (tonnes) per ha – top 20cm	Increase in t of AWC/ha/yr – top 20 cm
Soil packing density	% decrease in soil packing density/year	Tonnes of soil (packing density) per ha – top 20cm	Decrease in t of soil/ha/yr at constant soil volume – top 20cm
Nitrogen leaching and runoff	% decrease in nitrogen leaching and runoff	Kg of nitrogen lost per ha and per year	Decrease in t of N/ha/year
Soil erosion by water	% decrease in soil erosion by water	Kg of soil lost per ha and per year	Decrease in t of soil/ha/year



Database created – coefficients in relative values



- › 102 farm practices associated with at least one effect (among the 6 soil characteristics covered)
→ Example: R17- 'Catch crops' has a non significant effect on soil water retention capacity
- › 91 farm practices with at least one positive effect = **coefficients used** → Example: L111- 'creation of new hedges' reduces soil erosion by water by 52% and also positively impact other soil characteristics
- › Some **data gaps**: Only 25% of the 384 farm practices in the classification scheme covered and not for all soil indicators

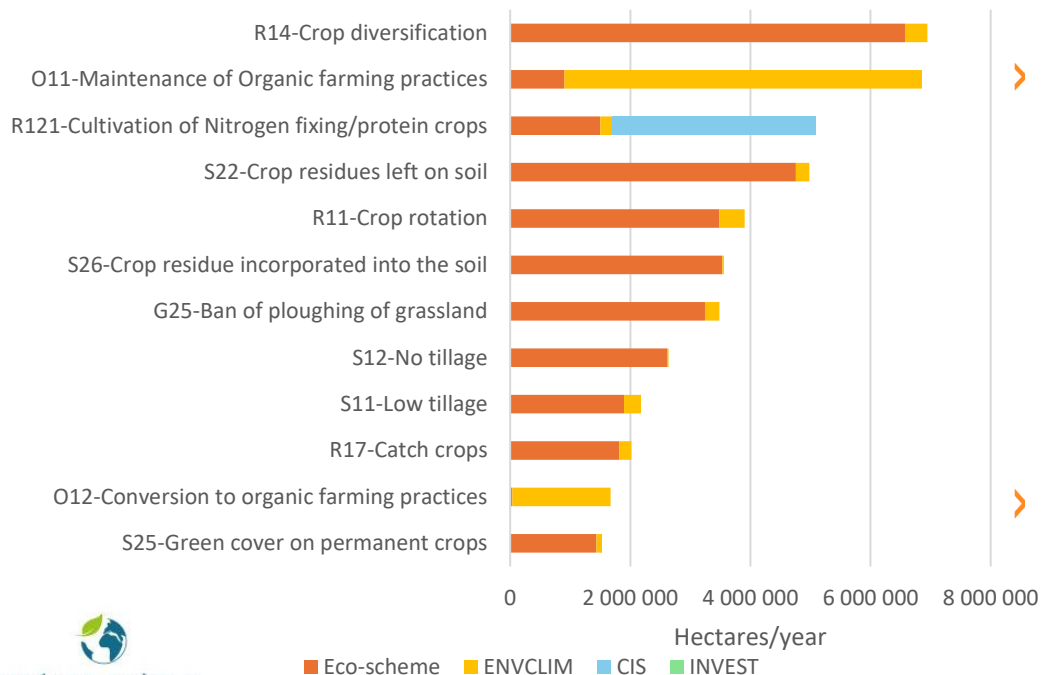
Examples of results for CSP interventions





Main farm practices supported by CSP interventions

Area covered by farm practices supported on more than 1.5 M ha per year-13 CPSs

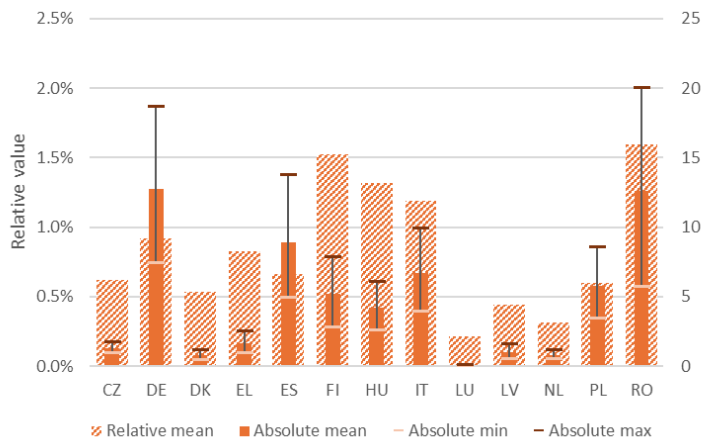


- › **Eco-scheme** is by far the type of intervention covering the largest areas
- › Top 3 farm practices in terms of area covered well distributed between the main types of interventions covered:
 - › R14 mainly supported by **Eco-schemes**
 - › O11 promoted through **ENVCLIM**
 - › R121 significantly supported through **CIS**
- › Marginal influence of **INVEST** interventions
S25 only among the top farm practices

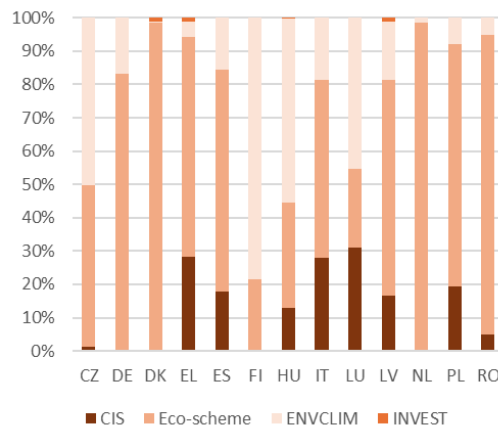


Interventions: Results for soil organic carbon content

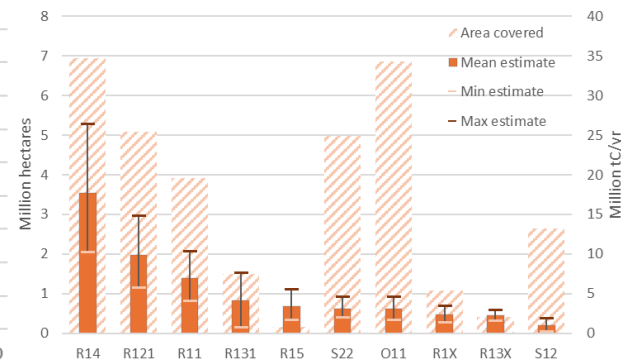
Estimated increase by MS



Breakdown by type of intervention



Top 10 farm practices (13 CSPs)



- Estimated potential increase in soil organic carbon content ranges from **0.21%** in LU to **1.59%** in RO
- High variability** of the results considering the 95% confidence interval (see RO, DE and R14)

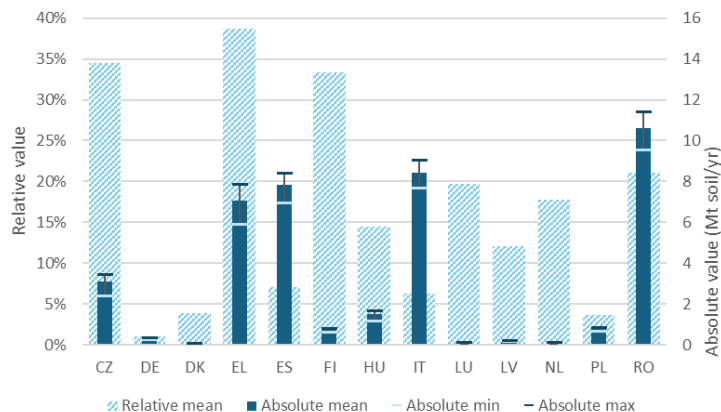
- Eco-schemes** contribute the most, ENVCLIM also play a major role in CZ, FI, HU and LU
- R14-crop diversification** overall contributes the most to the estimates: large area covered



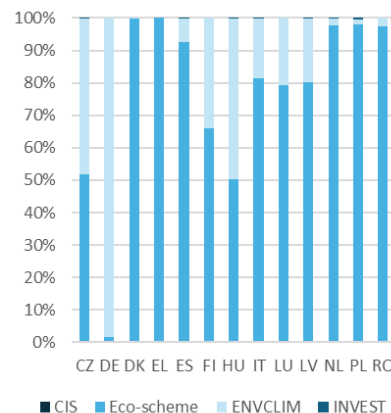


Interventions: Results for soil erosion by water

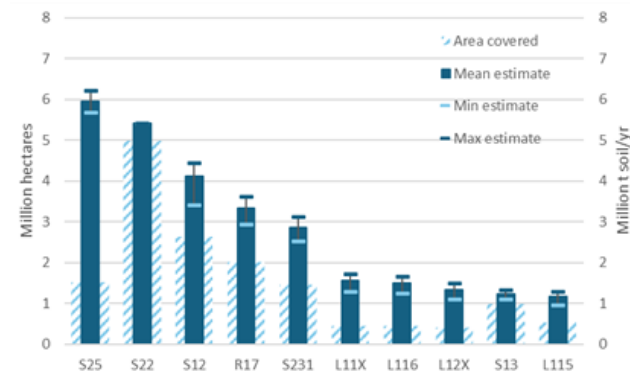
Estimated increase by MS



Breakdown by type of intervention



Top 10 farm practices (13 CSPs)



- Estimated potential decrease in soil erosion by water ranges from **1.07%** in DE to **38.69%** in EL
- Tight confidence intervals positively affecting the **robustness of the results**
- Preponderant role of **Eco-schemes** although **ENVCLIM** plays a significant role in most CSPs
- S25-Green cover on permanent crops** does not cover the largest areas but has a very high effect on soil erosion



Recommendations and conclusions





Main limits and associated recommendations

› General limitations

- › No robust counterfactual approach leading to different methods to assess the contributions of CSP interventions and GAECS → **should be developed for the purpose of CAP evaluation**

› Limitations related to the assessment of farm practices effects

- › Key soil characteristics missing such as soil biodiversity → **harmonised scientific evidence is needed**
- › Coefficients not adapted to specific pedoclimatic conditions and some key farm practices not covered (data gaps) → **need for more data at EU scale**
- › Rough harmonisation of the coefficients available → **need for a scientifically robust harmonisation/standardisation of the quantified effects of farm practices on soil**
- › Rough estimation of the effects of the maintenance of farm practices → **need for dynamic coefficients changing with the duration of the farm practice implementation combined with information on the duration of the implementation of the farm practice at plot level**

› Limitations related to the area coverage estimations

- › Approximative assumptions to link areas to farm practices → **Can be finetuned through in-depth case studies or by national managing authorities directly**
- › Non-coverage of certain types of interventions (Sectoral supports, Cooperation, or Knowledge exchange and dissemination) → **Can be better assessed ex post through more in-depth analyses**





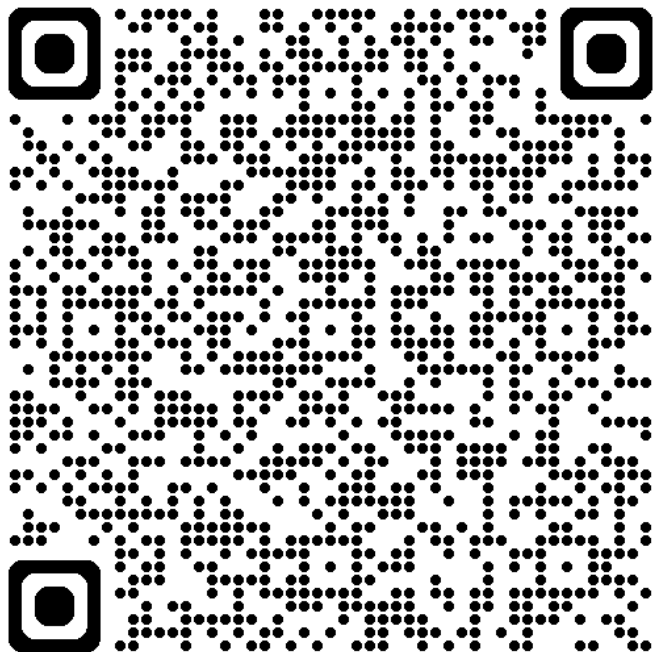
Conclusions

- The study creates a **link between CSPs, supported farm practices and their potential contribution to soil health** through six soil characteristics
- It illustrates **how quantified rough estimates can support the evaluation of the CAP's contribution to environmental and soil health objectives**
- As a policy evaluation tool, this methodology offers a way to link output indicators to soil health outcomes, although **several caveats and scientific gaps must be addressed to properly evaluate and quantify the impacts of the CAP on soil health**
- The study allowed to identify **main domains for improvements**:
 - improve coefficients: more context specific, reflecting local pedoclimatic conditions and crop systems
 - fill in data gaps on coefficients for some practices in the scientific literature
 - use implementation data on farm practices
 - distinguish between new practice on farm vs maintenance





Link to the study



https://eu-cap-network.ec.europa.eu/publications/rough-estimate-soil-protection-potential-cap-strategic-plans-over-2023-2027-period_enb





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