

EVALUATION SUPPORT STUDY ON THE IMPACT OF THE CAP ON SUSTAINABLE MANAGEMENT OF THE SOIL

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-Alliance Environnement-

European Economic Interest Grouping

Introduction to the issues at stake : state of EU soils



An estimated 6.24% of EU-27 agricultural land needs local assessment and eventual remediation action



Only five countries have more than 40% of their area with low or low-moderate risk to soil biodiversity

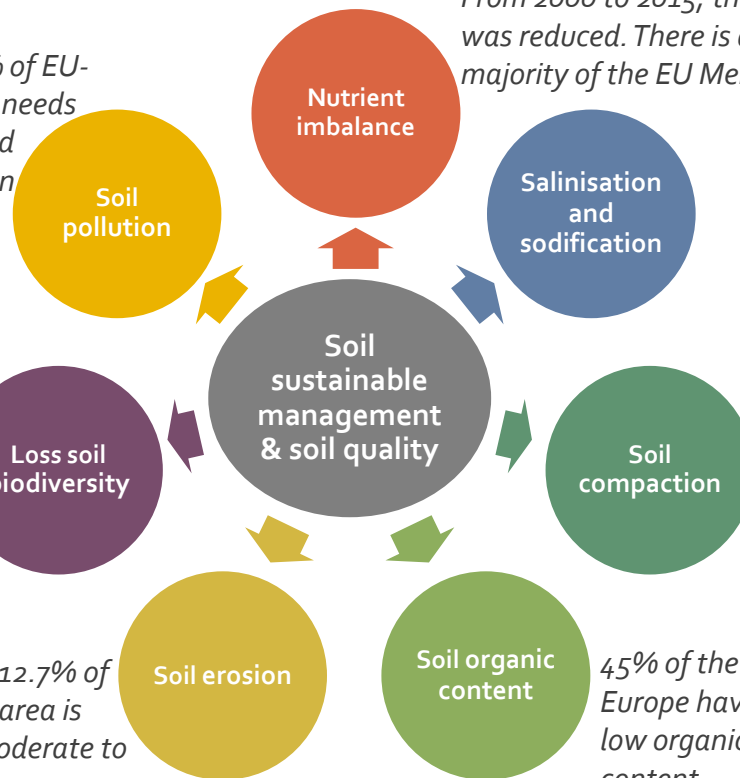


An estimated 12.7% of Europe's land area is affected by moderate to high erosion.

From 2000 to 2015, the potential nitrogen surplus was reduced. There is a surplus of phosphorus in the majority of the EU Member States



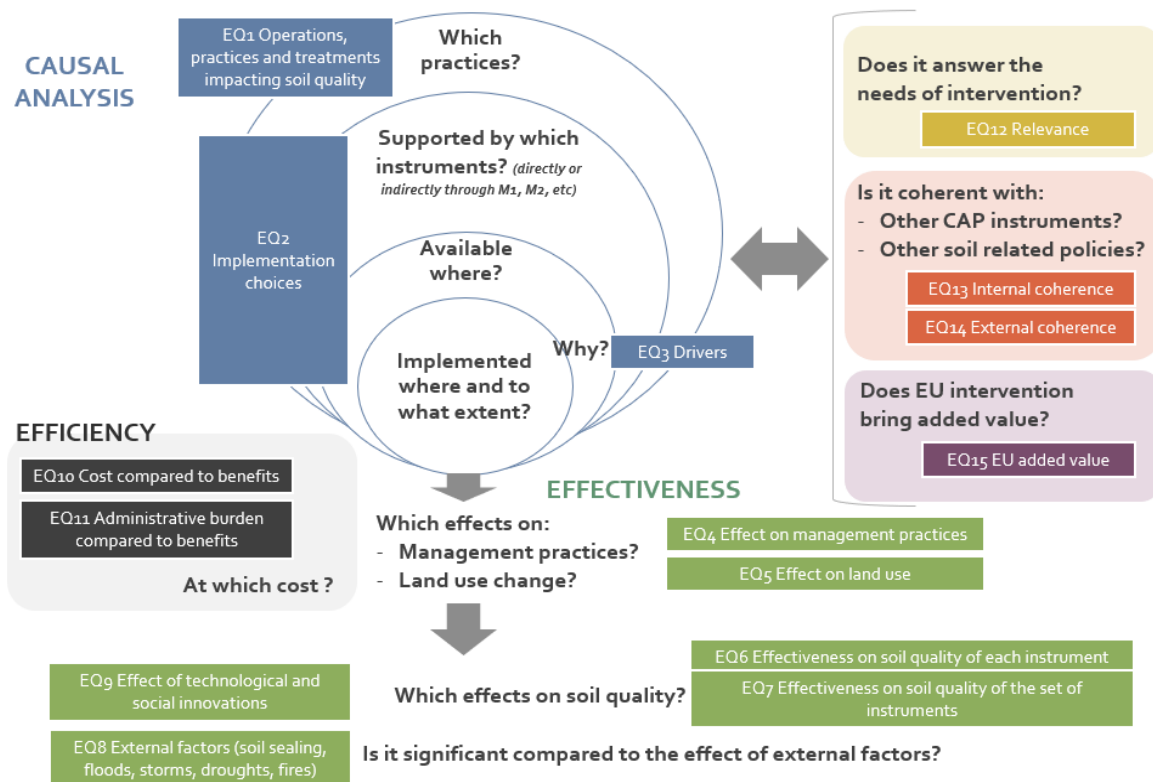
An estimated 32-36% of European subsoils have high or very high susceptibility to compaction



Introduction to the evaluation support study

- ❖ **Objective:** To assess the extent to which CAP instruments and measures have contributed, through impacting agriculture and forestry land use and practices, to sustainable management of the soil and influenced the soil quality.
- ❖ **Organisation:** study carried out by a team of external consultants, from Oct. 2019 to Nov. 2020.
- ❖ **Scope:**
 - EU-28 level
 - Taking into account the various threats on soil
- ❖ **CAP Instruments and measures to be considered:**
 - Horizontal regulation
 - Pillar 1
 - Pillar 2
- ❖ **15 evaluation study questions**

OVERVIEW OF THE EVALUATION FRAMEWORK



Source: Alliance Environnement

Overview of the method and data sources

❖ 10 case studies displaying a variety of situations across the EU:

- Criteria of selection : Biogeographical zones, National policy framework, Intensity and methods of production, CAP implementation choices, Soil threats.
- Regions or MS selected : BE-Wallonia, BG, CZ, DE-Bayern, DK, EL, ES-Aragon, IE, IT-Tuscany, SE.

❖ Interviews with all types of stakeholders:

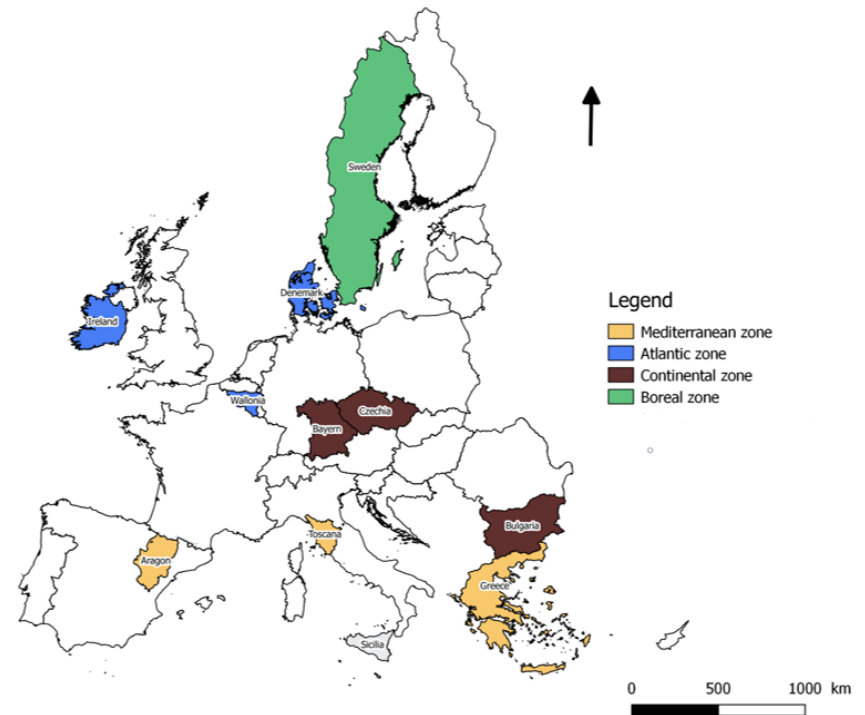
- Managing authorities
- Farmer's representatives and advisors
- NGOs and researchers
- Farmers

❖ Literature reviews on agricultural activities, soil productivity and innovations

❖ Data collected and analysed :

- Statistical data from Eurostat
- Implementation data from RDP and AIR report
- FADN database

AREAS SELECTED FOR THE CASE STUDIES



Source: Alliance Environnement

Final repartition of the tools used to inform the EQs

TOOLS AND DATA	CAUSAL ANALYSIS				EFFECTIVENESS				EFFICIENCY		RELEVANCE	COHERENCE		EU AD-VAL	
	EQ 1	EQ 2	EQ 3	EQ 4	EQ 5	EQ 6	EQ 7	EQ 8	EQ 9	EQ 10	EQ 11	EQ 12	EQ 13	EQ 14	EQ 15
Collection tools															
CAP monitoring data available at EU level (including AIR, ISAMM, etc.)		X		X	X			X				X	X		
Database providing context indicators (e.g. LUCAS, Eurostat, JRC, LULUCF, FSS)				X	X	X						X			X
FADN (data of the CS MS)			X	X		X							X		
Literature reviews	X			X	X	X		X	X	X		X	X	X	X
Complementary interviews with researchers and/or project's holder	X							X		X					
Online survey on innovations									X						
Results from previous EQs		X	X	X	X	X	X	X	X	X	X	X	X	X	X
In the case studies															
Interviews during case study (Stakeholders' knowledge and opinions)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Descriptive elements from RDPs and/or AIRs		X	X	X	X	X	X			X	X	X			
Additional monitoring data collected in case study		X		X	X					X			X		
Analysis tools															
Stakeholders analysis		X	X	x		x	X			X	X	X	X	X	X
Descriptive statistics		X	X	X	X	X				X	X		X		
Matrix and scoring	X	X				X			X		X	X	X	X	
Counterfactual analysis				X	X										

General limitations of the study

- ❖ **“Topic oriented” evaluation study: difficult breakdown of the implementation choices, budget, costs, benefits targeting SSM vs. other environment and climate objectives.** *EQ2-12, EQ15*
- ❖ **Issues related to agricultural soils not clearly identified by stakeholders:** limit to the identification of the needs (*EQ12*) soil-related national policies to be considered. *EQ14-15*
- ❖ **Impossible direct observation of the results of the CAP intervention**
 - **Geographical perspective:** in spite of the extensive data collection and information collected from EU farm, not possible to link geographical databases with CAP intervention and changes in impact metrics. *EQ4, EQ5*
 - **Timeline :** timescale of the evaluation study and of the CAP implementation incompatible with the observation of results. *EQ6*
- ❖ **Possible underestimation of some effects, due to the high variability in implementation choices**
 - In spite of the careful selection process of the CS, significant outputs in some MS or region may have been missed. *EQ4, EQ5*
 - The state of play at the EU level cannot be extrapolated from the situation in the CS areas.
- ❖ **Limited data on the adoption of soil-relevant practices and innovations** (e.g. tillage, agronomic practices, GPS, etc.). *EQ4, EQ6, EQ9*
- ❖ **Little information provided regarding the impact on “soil productivity”** *EQ4-5-6*
 - Unclear definition of ‘soil productivity: productivity can relate to either soil fertility or yields.
 - Concrete impact of CAP measures and instruments on soil fertility can be observed only on the long term.
- ❖ **Regarding data :**
 - **FADN:** Samples were too small to run complete statistical analysis; No breakdown possible to discriminate the influence of some specific measures *EQ 3, 4, 5*
 - **Survey on innovations:** the amount of answers received could not bring robust and representative results reflecting the situation in the CS areas. *EQ 9*
 - **Counterfactual analysis** implemented on *EQ 4* (effect of M10.1 and M11 on expenses in PPP, fertilisers and manure) only.

Causal analysis (EQ 1, 2, 3)

- ❖ **Organic amendments, permanently covered areas** (e.g. forest, grasslands, wetlands) and **landscape elements, have a positive impact on all soil quality in any context (EQ1)**
- ❖ **Little impact of the implementation of soil conservation practices should be expected on yields** when farmers are appropriately trained (EQ1)
- ❖ **Activities contributing to SSM could be fostered by CAP, but key activities** (e.g. limitation of plot size, no-reduced- or late tillage, controlled traffic, diversified crop rotation, compost application) **are not enforced by the EU regulation, even in hotspots:** the absence EU definition of vulnerable areas resulted in no clear provisions at the EU level (e.g. under GAEC 4, 5, 6) (EQ2)
- ❖ **Soil quality issues little weighed in the CAP implementation choices (EQ3) :**
 - Member States and managing authorities primarily addressed biodiversity and water concerns.
 - At farm level, potential loss of productivity due to a deteriorated soil were little considered.

GENERAL IMPACT OF ACTIVITIES ON SOIL QUALITY

	Land use	Management practices
+	Establishment and maintenance of forest, grasslands, landscape elements (grass strips, hedges, terraces, etc.)	Cover- winter- N-fixing crops, Mulching and input of organic amendment Contour farming
-	Conversion to arable land Enlargment of plots	Burning (forest and crop residues) Clear felling, whole-tree harvesting Heavy machineries
+ / -	Forest ⇔ grassland Drainage	Tillage practices, Diversification, Irrigation, Fallow

Source: Alliance Environnement

IDENTIFIED SOIL ISSUES IN SWOT ANALYSES OF CASE-STUDY RDPs

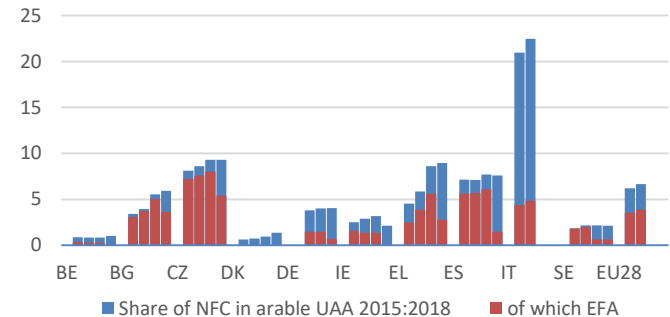
Soil threats	BE	BG	CZ	DK	DE	IE	EL	ES	IT	SE
Erosion	*	***	**		**		*	*	*	
SOM										
Compaction										
Salinisation										
Pollution										
Soil biodiversity										
Nutrient balance										

Source: Alliance Environnement

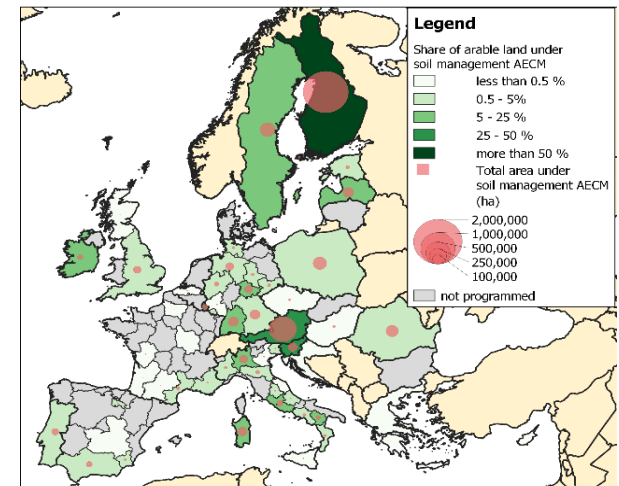
Effects of CAP measures and instruments on management practices (EQ 4)

- ❖ **Management of inputs:** additional effects of the GAECs (in NVZs, 49% of the UUA), greening (ban of PPP on EFAs, 9.6 million ha), support to organic farming and AECM brought significant results
- ❖ **Catch, cover and N-fixing crops:** fostered by SMR1, GAEC 4, Greening-EFA = 4.6 million ha in 2017, AECM
- ❖ **Crop diversification, manuring and compost application and conservation tillage:** fostered mainly by AECMs, thus on limited areas (AECM for crop diversification and crop rotation = 2% of the arable land)
- ❖ **Ban of ploughing of permanent grassland (in 9MS) and ESPG :** key role on carbon storage and erosion
- ❖ **Forest management practices** sustainable for soil could be supported by M8.5 and M15.1 but little impact on soil management

CHANGE IN THE AREA COVERED BY N-FIXING CROPS (IN % OF ARABLE LAND) BETWEEN 2015 AND 2018



AREA UNDER AECM SUPPORTING SOIL COVER MANAGEMENT AND TILLAGE PRACTICES IN 2018

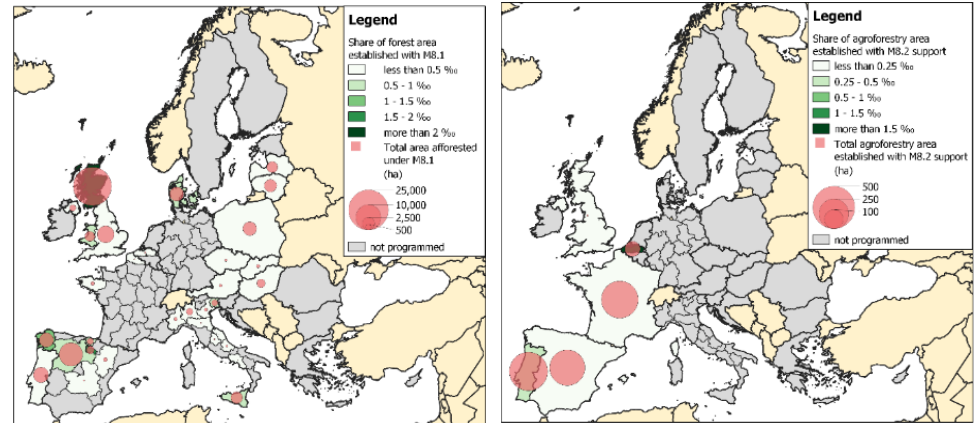


Source: DG AGRI, ISAMM notifications, Eurostat 2015: 2018

Effects of CAP measures and instruments on land use (EQ 5)

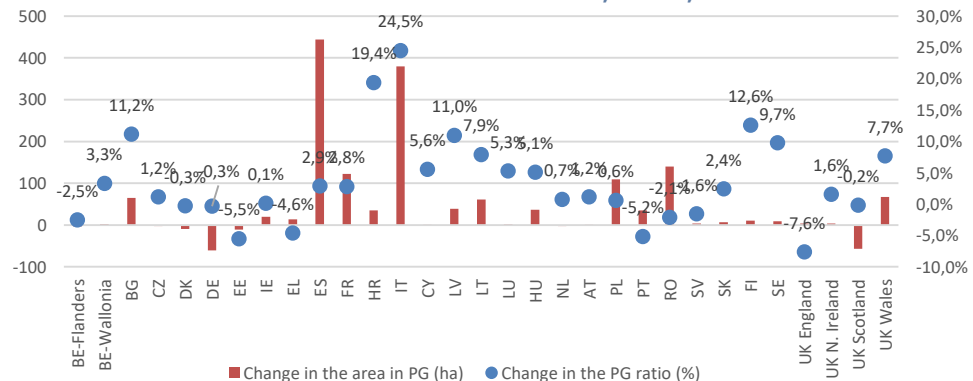
- ❖ **Afforestation and the establishment of agroforestry systems** : only fostered by voluntary measures, with no significant result on forest (+0.04%) and agroforestry (+0.01%).
- ❖ **Creation and/or upkeep of landscape elements**: clear contribution of GAEC1 to the establishment of grass margin, but the contribution of GAEC 4 &5 could not be clearly estimated. **AECM** (M10.1) for biodiversity brought a significant contribution (2.2 million ha under contract in 2018).
- ❖ **Maintenance of grassland** : key role of support to organic farming (M11), in addition to the greening ratio requirement (+1.46 Million ha since the reference year). AECM role is more limited, but they contributed to the **conversion of arable to grassland** (e.g. 11 400 ha in BG, 16 600 in DE-Bav.).
- ❖ Potential to contribute to the limitation of plot size (e.g. GAEC7 in CZ) and to the maintenance of stone walls (e.g. GAEC5 and 7 in IT and ES)

AREA SUPPORTED FOR AFFORESTATION AND AGROFORESTRY BETWEEN 2014 AND 2018



Source: Alliance Environnement, based on DG AGRI (data from AIRs 2018) and Eurostat

CHANGES IN THE AREA IN PERMANENT GRASSLAND, BY MS, FROM 2014 TO 2018



Source: Statistics on Greening, 2018

Results on soil quality and productivity (EQ 6, 7)



Erosion



Relevant practices implemented (EQ4-5), but **little progress on the 2010-2016 period** (-0.4% in all lands and -0.8% in arable land) suggests **efforts need to be reinforced, in particular in hotspots**



SOM



CAP **effects cannot be established** on the 2014-2020 timescale, though positive effect were demonstrated at the local level : **need of long-term implementation** to secure effects on SOM



Soil
biodiv.



No effect monitored or established.



Soil
pollution



No effects clearly monitored at the MS or EU level, but **demonstrated local effects** and **additional effects** of SMRs, EFAs and support to Organic Farming.



Nutrient
balance



Additional effects of EFA, SMR, AECMs, but **no improvement on N balance since 2010** suggest efforts need to be reinforced



Salinisation



Compaction



No instruments clearly addressed those issues.



Productivity



Most of the **soil-related practices supported by the CAP** do improve soil **productivity** on the long term

Effects of other factors on the implementation of sustainable soil management (EQ 8, 9)

❖ Technological and social innovations are being developed:

- Still, their level of adoption is too low to assess their impact at the EU level.
- The practices reviewed in the previous slides and agroecological practices remain those with the highest potential to tackle soil threats.

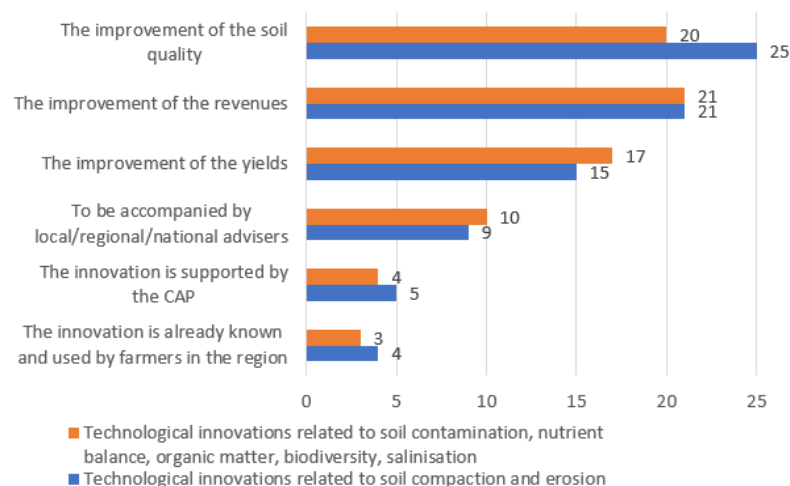
❖ Barriers to adopt innovations :

- Mainly economical but also the absence of an enabling environment improving farmer awareness and knowledge.
- EU research programs and CAP measures (M1, M2, M4, M16) may lift barriers, and promote cooperation between stakeholders .

❖ Natural events (e.g. floodings, droughts):

- can lead to soil degradation and will be more intense and numerous in the future.
- hardly influenced soil-related CAP measures design or implementation (in spite some derogations were asked).

FARMERS' MOTIVATIONS TO ADOPT TECHNOLOGICAL INNOVATIONS



Source: Survey to farm advisors. The results should be taken carefully (in particular regarding the place of the improvement of soil quality).

Proportionality between the costs, benefits, and administrative burden associated with the CAP intervention (EQ 10, 11)

- ❖ **Horizontal and greening instruments designed to address SSM** (GAEC4-5-6, crop div.) **had little effects, while involving significant administrative costs** (EQ11)
- ❖ **Soil-oriented AECMs can have more specific effects on soil quality, for a lower payment/ha than support to organic farming** (EQ10)
- ❖ **Design and management of tailored AECMs can be heavily burdensome, but it appears proportionate to their results.** Organic farming is less difficult to manage for administrations and farmers, but less specific (EQ11)
- ❖ **Support is necessary** to foster non-profitable practices and land-use and maintain exiting “positive” practices (EQ10)

ESTIMATED ADMINISTRATIVE BURDEN AND EFFECTIVENESS OF BURDENSOME SOIL-RELEVANT CAP MEASURES AT EU LEVEL

	Admin. burden on ...		Ability to tackle ...		
	national / managing authorities	farmers	erosion	loss of SOM	other soil quality issues
AECM			++	++	++
Organic farming			0	+	++
GAEC 4			+	0	0
GAEC 5			+	0	0
GAEC 6			0	+	0
Greening - Crop div.			0	+	+

Source: Administrative burden: case-studies; Ability to tackle soil threats: analysis of the effectiveness

Relevance of the CAP regulations and implementation choices to address sustainable soil management (EQ 12)

❖ **CAP contribution to tackle soil threats highly depends on implementation choices** taken by MS or regions: no significant provisions are taken at the EU level to ensure the needs are addressed.





❖ **Uneven alignment of local implementation choices with the soil threats at local level**

- difficulties for local authorities to set strong rules at the Member State level, on account of the need to keep the agricultural sector competitive at the EU level and electoral considerations.
- Needs on erosion and SOM often addressed through voluntary measures, when it should be included in the CC baseline in hotspots.
- The CAP framework does not point to the issue of soil compaction. Pesticide residues in soils are not explicitly addressed.
- Soil pollution and soil nutrient balance were tackled through provisions related to other objectives (e.g. water quality)

❖ **Farmers' needs of a safety net to take risk and switch to conservative farming practices are not be addressed by the CAP.**

SCORING MATRIX OF THE RELEVANCE OF CAP OBJECTIVES TO THE NEEDS IN SOIL QUALITY IN THE CASE-STUDY AREAS

	BE-Wal.	BG	CZ	DE-Bav.	DK	EL	ES-Ara.	IE	IT-Tus.	SE
Prevent erosion	Yellow	Green	Yellow	Green	Grey	Green	Yellow	Grey	Green	Grey
Maintain SOM	Red	Red	Green	Yellow	Red	Green	Yellow	Grey	Green	Grey
Protect soil biodiversity	Grey	Red	Red	Green	Red	Red	Red	Red	Grey	Grey
Reduce soil pollution	Green	Green	Green	Grey	Green	Green	Grey	Green	Grey	Green
Avoid soil compaction	Grey	Grey	Red	Red	Red	Red	Grey	Yellow	Grey	Grey
Equilibrate soil nutrient balance	Green	Green	Green	Green	Green	Green	Green	Green	Green	Grey
Avoid salinisation	Grey	Grey	Grey	Grey	Grey	Red	Red	Grey	Grey	Grey

	The CAP measure objectives sufficiently address the need		The CAP measure objectives do not address the need
	The CAP measure objectives partially address the need		Not identified as a need

Source: Alliance Environnement, based on the results of the analysis at case-study level

Coherence of the CAP intervention (EQ 13, 14)

Internal coherence of the CAP as regard the objective of soil sustainable management

- ❖ **Little synergies and no incoherences** between the instruments & measures targeting SSM (EQ7).
- ❖ **Decoupled (area-based) direct payment indirectly hinders the establishment or maintenance of landscape elements and forests**, but provisions may be taken to compensate potential negative effects (e.g. IE).
- ❖ Fostering small farmers (SFS and Redistributive payment) may contribute to promote sustainable farming systems, but the impact on SSM is unclear.
- ❖ **Mixed effects of Voluntary Coupled Support** which fostered N-fixing crops and animal husbandry but also root crops.
- ❖ **Payments to area with natural constraints** contribute to the maintenance of grassland. But spontaneous reforestation or afforestation may have a positive effect for soil protection.

Coherence of the CAP with other policies fixing objective for the management of agricultural soils

- ❖ At EU level, the Soil Thematic Strategy and the 7th Environmental Action Programme both set **objectives to prevent soil degradation and promote SSM but no quantified targets associated**.
- ❖ CAP contribution to the soil-related objectives set in other EU environmental legislation and strategies is not required to be demonstrated by the Member States, and no targets are quantified.
- ❖ Soil-related objectives set in the EU legislation (e.g. climate, biodiversity, etc.) are often not the primary focus of the legislation.
- ❖ **EU environmental policies strongly articulate with the CAP**. Their binding objectives strengthen the CAP contribution to addressing the EU soil-relevant objectives.
- ❖ **Important role of the EU** because a majority of Member States does not have a specific strategy, action plan or programme targeted directly at SSM.

EU added value (EQ 15)



- ❖ Despite mixed impacts of the CAP on soil protection (see previous EQs); **EU regulations seem to have raised the level of ambition and budget allocated to soil protection**, although assessing what would have been done by the Members States in the absence of an EU framework is highly hypothetical
- ❖ **EU-level rules ensure a level-playing field**, avoiding a race to the bottom regarding environmental and soil-related actions
- ❖ **National or regional policies protecting agricultural soils are scarce and rarely focus on the whole soil threats.**
- ❖ **Strict conditionality on direct payments, and a tiered approach based on the mapping of vulnerable areas** appear to be key success factor also for non-CAP soil-related policies/projects.
- ❖ **Few gains of political coordination for soil protection** are provided by the CAP framework. **Lack of a common definition of soil and soil threats.**
- ❖ **Technical cooperation fostered by EU or CAP measures and instruments** (e.g. M16, EIP-AGRI groups, H2020 research groups).

Recommendations on policy design and implementation

To establish an EU framework that ensures common definitions of soil and soil threats are adopted across the Member States and sets common definition for sustainable soil management and soil conservation agriculture. Ensuring the adoption of common definitions of soil, sustainable soil management, conservation agriculture and soil threats is a prerequisite to fostering coordination among Member States or regions and for facilitating the spread of conservation practices in the EU, but also research on those practices and the design of instruments to support conservation practices.

To establish binding requirements for Member States to achieve the objectives set in the soil-related EU legislation. These requirements should be accompanied with quantified targets and appropriate monitoring tools.

To raise awareness among all stakeholders on the issue of soil quality and include it in the CAP objectives overall, so that it can be addressed on an equal footing with other environmental issues (e.g. biodiversity, water quality, etc.).

To establish an EU mapping of vulnerable areas, in particular in relation to sensitivity to soil erosion and the loss of soil organic carbon. This mapping (that may be based on the data available from JRC) could then be used in defining the requirements of future soil-related GAEC at EU level, thus ensuring that relevant actions are taken to tackle soil degradation in vulnerable areas.

Recommendations to scale-up the CAP contribution to sustainable soil management

To ensure the large-scale implementation of the 'first line' activities that are necessary for avoiding soil degradation and beneficial in any context: cover crops, establishment of landscape features, maintenance and creation of permanently covered areas. The requirements set for cross-compliance should ensure their implementation in vulnerable areas, through the GAECs, and specific measures should be designed at the EU level to provide incentive toward their large-scale adoption at the EU level.

To better support the implementation of 'second-line' activities that are crucial for soil conservation: tillage reduction, diversified crop rotation and agroforestry.

Guidance and examples of good practices, provided at EU level, on how to design instruments and measures targeting sustainable soil management (e.g. requirements for the GAECs relevant to addressing local soil-related issues, AECMs for soil conservation) may contribute to the implementation of this recommendation.

To support the consolidation of knowledge and its transmission to farmers through quality advice on sustainable soil management. The choice of practices and appropriate innovation requires tailored agronomic expertise, taking into account the specific context at farm level. A broader implementation of the measures supporting training, knowledge transfer and cooperation among stakeholders can be a key to removing barriers to innovations and allowing farmers to implement sustainable soil management practices while limiting economic risks.

To enhance long-term and result-oriented approaches to the implementation of both regulatory and voluntary schemes, in particular with regard to soil organic matter, for which the results can be proven in the long term only. Ensuring technical support for farmers, to help them achieve expected results, seems crucial for guaranteeing the effectiveness of such approaches.

To address harmful practices and on-going trends (e.g. use of plastic in fields, use of continuously heavier machinery, land abandonment occurring on terraces, enlargement of field size) whose impact is increasingly significant. New CAP instruments or measures should be designed to address those issues.

To swiftly anticipate, prevent and mitigate the growing impact of natural events. The agricultural practices implemented should be resilient to the recurrence of natural events. Authorities should be prepared to react accordingly so that, as soon as the events occur, the actions taken can be fully operational in order to limit impact on soil quality.

Recommendations on data and monitoring

To improve monitoring for each type of operation supported under the RD measures, notably the information on actions undertaken under the support for knowledge transfer and information actions (M1), for advisory services, farm management and farm relief services (M2), for non-productive investments (M4.4), for operations improving soil management under agri-environment and climate measures (M10) and for support for EIP groups implementing innovative collaborative actions (M16).

To further use the opportunity of the FADN sample to monitor environmental impact, such as the quantity of phytosanitary products / fertiliser used, or the area ploughed.

The FADN is a powerful database, which can provide very useful information on changes in the implementation of agri- and environmentally friendly management practices and the impact of the CAP support. It could also be worth including data on the practices implemented or AEC indicators. It would also be interesting to have a variable for the payment received under each RD measure/ sub-measure. Moreover, coherence of data among Member States (notably regarding variables on N, P, K quantity) should be ensured.

To develop the monitoring of administrative costs related to the implementation of CAP instruments. This would allow for better understanding of the cost efficiency of the measures, for further evaluation studies.