Carbon farming and the CAP: Insights from Member States evaluations

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EVALUATION HELPDESK EXPERT

The Evaluation Helpdesk database

56 evaluations on climate change issues from over

500 stored in EH's evaluation database

46 evaluation in 2021-22

31 evaluations from MSs with regional RDPs: IT(18), DE(7), ES(6)

25 evaluations from AT, CZ, EE, FR, HU, IR, LT, LU, LV, MT, PL, SE, UK

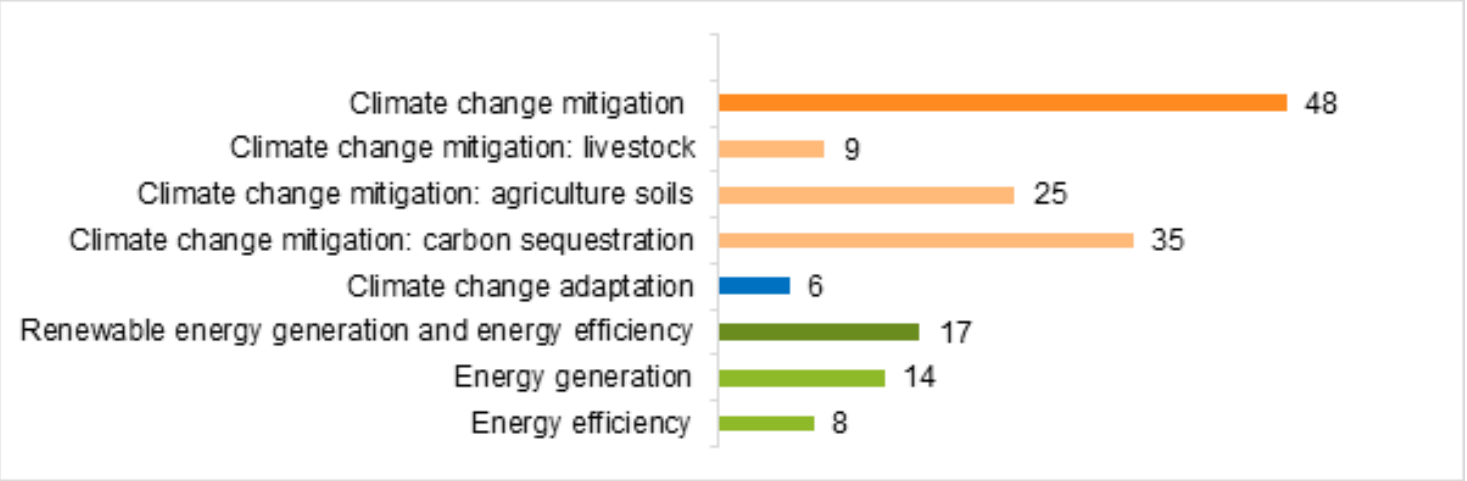


Figure: Classification of 56 evaluations grouped according to the identified types of climate change findings.

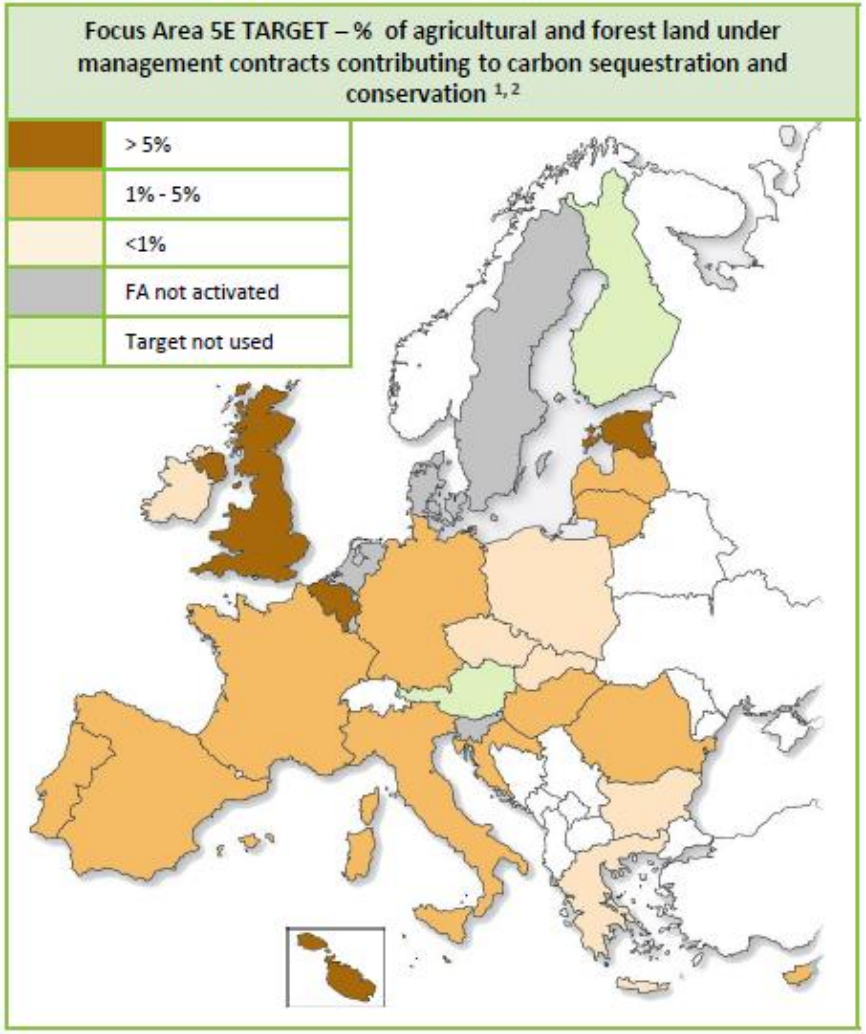
Source: CAP evaluation database (2024), EU CAP Network
Graph by Anna Gregis.

The Evaluation Framework

Focus Area (FA) 5E: designed to support actions that foster carbon conservation and sequestration in agriculture and forestry.

One of the main ways to achieve this goal is through investments in forest area development and improvements in the viability of forests. A number of RDPs complement this measure with others such as the Agri-environment-climate measure , Knowledge transfer, Cooperation and Advisory Services.

The target is to mobilise4 billion EUR of public expenditure to support 2 % of the EU agricultural land in contributing to carbon sequestration and conservation.



Carbon farming:
farm practices for GHG emission reduction

Livestock

- Enteric fermentation – low methane diets, genetic improvement, animal welfare
- Manure management

Organic soils (peatlands, moorlands, etc.) – no cultivation, re-wetting

Farm practices – anything that reduces fertilisation

- Organic agriculture
- Land set aside
- Conservation agriculture (Low or no tillage, residue management, etc.)
- Protection strips and zones
- Landscape elements

Carbon farming:
farm practices for carbon sequestration

Afforestation of arable land (agroforestry)

Grasslands – Permanent, temporary carbon management

Organic soils (peatlands, moorlands, etc.) – no cultivation, re-wetting

Farm practices

- Organic agriculture
- Cover and catch crops
- Land set aside
- Conservation agriculture (Low or no tillage, residue management, etc.)
- Protection strips and zones
- Landscape elements

This is indicative, the good one is coming in the presentation by Avis

Afforestation of arable land:

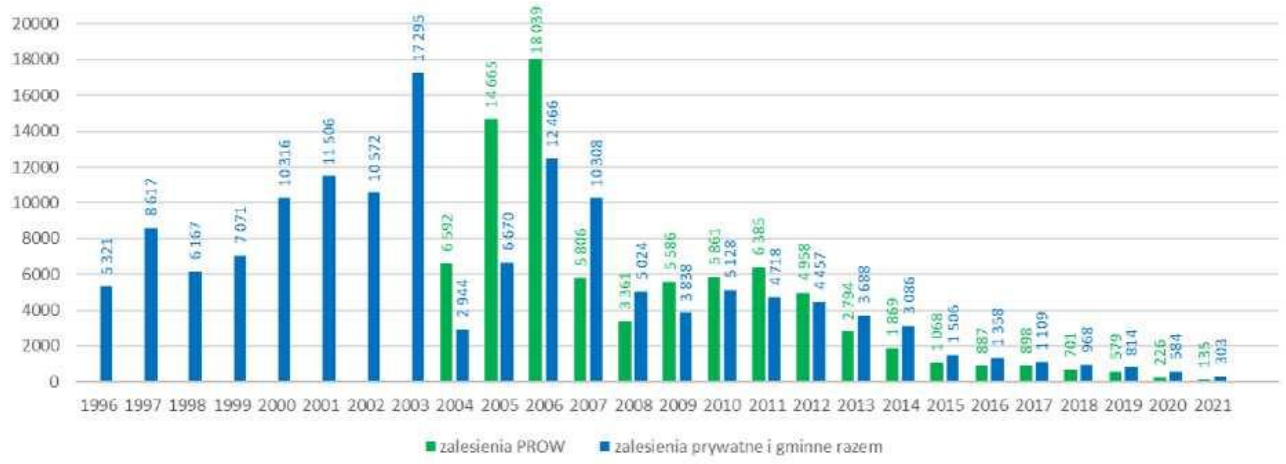
18 of the 35 studies show strong effects

Afforestation: a measure of great potential

RDP interventions	Area	Stored Organic Carbon		Co2 eq in
	ha	kg ha^{-1} year^{-1}	Mg year^{-1}	Mg year^{-1}
Agricultural land management (all)	**288.098**	**61**	**17.898**	**65.686**
Afforestation (all different forms)	**3.902**	**1.832**	**7.149**	**26.213**
Overall total	**292.000**	**86**	**25.047**	**91.890**

Emilia Romagna, Italy

but of low uptake



Poland

Lock-in by long-term and irreversible commitments
The value of land is high

Temporary grasslands
20 of the 35 studies show strong effects

Luxembourg: Temporary grassland in a 6–8-year rotation with silage maize and cereals (3-4 years), and temporary grassland (3-4 years) (%C for the 0-25cm depth).

> "Considered separately, the introduction of temporary grassland in the crop rotation seems the most effective practice for improving SOC content in croplands. … fields submitted to temporary grassland had mainly higher SOC content than Control fields, with significant positive difference detected" in various soil regions of Luxemburg (page 50)

	Control							Temporary Grassland							Difference	
Assoc.	n	min	Q1	median	mean	Q3	max	n	min	Q1	median	mean	Q3	max	mean	p-value
ALL	960	0.3	1.2	1.6	1.8	2.0	5.2	599	0.5	2.0	2.7	2.7	3.3	6.0		
1	164	1.70	2.40	2.80	2.86	3.30	5.20	388	1.40	2.60	3.00	3.14	3.66	6.00	0.28	**< 0.001**
2	69	0.70	1.40	1.60	1.58	1.70	2.90	22	1.10	1.43	1.70	1.69	1.88	2.70	0.11	NS
3	35	1.00	1.50	1.60	1.74	1.90	3.50	15	1.60	2.00	2.60	2.59	3.15	3.60	0.86	**< 0.01**
4	10	1.10	1.45	1.55	2.16	2.80	4.90	1	1.70	1.70	1.70	1.70	1.70	1.70	-0.46	NS
5	172	0.25	1.00	1.10	1.15	1.30	2.00	44	0.60	1.10	1.30	1.30	1.43	2.10	0.16	**< 0.01**
6	175	0.70	1.20	1.40	1.39	1.60	2.60	26	1.10	1.40	1.60	1.64	1.78	2.50	0.26	**< 0.02**
7	182	0.90	1.50	1.70	1.79	2.00	3.90	35	0.90	1.40	1.70	1.84	2.20	3.20	0.04	NS
8	76	0.90	1.38	1.60	1.70	2.00	3.50	23	1.10	1.50	1.90	1.93	2.40	3.40	0.23	NS
9	12	1.40	1.50	1.75	1.77	1.93	2.30	10	1.60	2.18	2.53	2.68	3.40	3.70	0.91	**< 0.01**
10	65	0.80	1.20	1.50	1.61	1.80	4.20	35	0.50	1.45	2.10	2.15	2.70	3.60	0.53	**< 0.01**

- Sweden and UK:

  Spectacular effects but… (listen from the evaluators)

Managing and restoring organic soils (peatlands and moorlands)

Organic soils have a great **dual** potential to reduce net direct GHG emissions (immediately), protect stored carbon (immediately) and increase carbon storage (long-run)

- Sweden: emissions from organic soils approx. 4.1 million tons of CO2 eq (the single largest source of GHG emissions in agriculture)*
  - A rewetting of all agricultural land on organic soils can reduce GHG emissions by 2.2 million tons of CO2 eq.
  - Rewetting results to a high economic costs per kg of CO2. Rewetting generates a wide range of environmental benefits (services). If we apply a holistic accounting (ecosystem service accounting) is this measure viable?
- Germany: Re-wetting of organic soils is complex
  - Extensification of agriculturally used organic soils has equal effects to a 10% reduction in animal numbers and rewetting the moorlands an effect equivalent to reducing animal numbers 20-30%**
  - the rewetting of bogs can be a lengthy, conflictual and complex project
  - a successful rewetting of peatlands, implies land availability through land acquisition, land consolidation and the technical implementation of irrigation***

* SE - Möjliga klimatåtgärder och styrmedel i ett framtida landsbygdsprogram (Possible climate action and policy instruments in a future RDP)

** DE - Baden-Wurttemberg, Möglichkeiten zur Verstärkung des Aspektes Klimaschutz in den landwirtschaftlichen Förderprogrammen (Ways to strengthen the aspect of climate protection in agricultural support)

*** DE - Niedersachsen-Bremen, Evaluation report on the funding measure "Land Management for Climate and Environment"

Organic agriculture and other farm practices in Emilia Romagna

Carbon sequestration

RDP interventions	Area	Stored organic carbon		CO2-eq
	Hectare	kg ■ ha^{-1} year^{-1}	Mg year^{-1}	Mg year^{-1}
10.1.01 – Integrated production	112.674	12	1.353	4.966
10.1.03 Increase in organic matter	11.213	578	6.482	23.789
10.1.04 Preservative agriculture and increase of organic matter	1.221	761	929	3.409
10.1.07 Sustainable management of extensive grassland (non-emissions)	8.124	557	4.526	16.610
10.1.10 Withdrawal of arable crops for 20 years for environmental purposes	5.710	262	1.495	5.487
M 11 – Organic production	**148.5**	**18**	**2.886**	**10.592**
Optional additional commitments to TO 10.1.01, TO 10.1.04 and M 11 (Cover crops)	645	352	227	833
Agricultural land management totals	**288.098**	**61**	**17.898**	**65.686**

GHG reduction (nitrous oxide)

Interventions	Area invested (hectares/year)	Reduction Mg CO2-eq
10.1.01	112.674	3.600
11.1.01/11.2.01	**148.511**	**9.450**
10.1.02	5.465	610
10.1.04	1.221	160
10.1.07	8.124	890
10.1.09	1.175	410
10.1.10	5.139	1.520
TOTAL	***282.309***	***16.650***

Challenges

Emission leakage

Knock-on effects

Scale and scalability of solutions

Feasibility of solutions (technical, legal, institutional)

Relevance

Coherency

Efficiency – multiple services

What is ahead?
Lessons learnt from evaluations

Carbon farming is an undisputable and effective strategy in support of climate change policies in agriculture

CAP has been successful in contracting land to carbon farming activities but not very effective since some of the “high impact” farm practices such as afforestation and peatland restoration still fail to attract land and farm owners

Efficiency is low if carbon storage is the only service delivered by carbon farming, but is it?

Targeting, eligibility, long-term planning and coordination of funds can increase the results