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Erosion impacts

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1 Introduction

There is a need for socio-economic information on sustainable land management and soil protection to guide decision making on Erosion Control Measures (ECMs) and to inform policy incentives. The implementation of soil erosion control policies on ground depends so much on the willingness of the farmers to apply the recommended measures to the day-to-day farming. There are many factors that determine the decision of farmers about implementing erosion control. One of the most prominent is the risk of how the implementation affects the farm's profitability and the associated additional costs (Tepes et al., 2022).

This deliverable provides and discusses insights on the available information regarding the costs of ECMs. It aims to create a catalogue of the estimated local cost for different erosion control measures across the study areas. The information is expected to guide investment decisions to promote erosion control measures at farm level.

The ECMs analysed are based on those identified in previous work as effective in mitigating the off-site impacts of soil erosion by disrupting water and flow paths in agricultural landscapes.

In the first part of this report, we present the methodology used in the study together with a discussion of its limitations. The analysis of the results, both by types of measures and by countries, is covered in the second part. The report concludes with a discussion that contrast the data obtained from this survey with those stemmed from other sources and presents the conclusion drawn.

2 Methodology and data source

Due to the complexity of assessing the cost of ECMs based on market prices for the different countries involved in SCALE, the specific costs for ECMs have been estimated using the agri-environmental payments that farmers receive for adopting different ECMs through the Common Agricultural Policy (CAP) as a proxy.

CAP Strategic Plans support a wide range of interventions addressing the specific needs of EU countries and their territories. They encourage the transition towards a smart, sustainable, competitive, resilient, and diversified agricultural sector, while ensuring long-term food security. As identified in the SCALE deliverable WP1-D2, beyond the GAECs (which are mandatory), some ECMs are subsidized through eco-schemes, and other ECMs are subsidized by other means. The amount of these compensations is included in each of the National CAP Strategic Plans.

2.1 Data collection

Data were gathered through an inventory of the CAP measures conducted by the SCALE partners. They were asked to provide the information contained in the CAP Strategic Plan regarding:



- Measure: Identify the ECMs that are going to be subsidized according to the CAP Strategic Plan and list them.
- On-site/Off-site measure: Classify the ECM as an “on-site measure” or an “off-site measure”.
- Disconnection measure: Categorize (yes/no) the ECM as a measure to avoid hydrological connectivity.
- Territorial scope: Indicate if the ECM is subsidized in all the national territory, or in some specific regions.
- Source of funding: Indicate (yes/no) if the ECM is funded through eco-schemes.
- Land use: Specify for which type of land use the ECM is subsidized.
- Requirements: Show the general requirements, including the existence of flexibilities, that should be met to access the subsidy.
- Crops: Specify if the ECM is subsidized in a specific crop (e.g. vineyard, potato) or crop type (e.g. woody crops, cereals), or not.
- Subsidy: Estimation of the “planned unit amount” of subsidy for the application of a specific ECM.
- Subsidy range: Minimum and a maximum amount that a farmer can receive with the application of a measure, considering the different situations that can occur.

2.2 Categorization of erosion control measures

ECMs are often named in very similar ways, and conversely, the same name can encompass different measures in practice. Thus, clustering the sustainable land management (SLM) and erosion control measures into categories is necessary for analyzing their efficacy and cost efficiency.

Wen et al. (2023), in a global review of the application of soil erosion control techniques, grouped them in three subgroups: engineering, cropping and biological techniques. Rosa-Schleich et al. (2019) identified the following so-called diversification farming systems: cover crops and green manure, diversified crop rotation, reduced tillage, intercropping, agroforestry, structural elements and the combined practices: conservation agriculture, mixed crops-livestock and organic agriculture. (Tepes et al., 2021), analyzing the costs and benefits of the soil protection and sustainable land management practices in Europe, used a system based on WOCAT classification that grouped into five clusters: soil management, vegetation management, infrastructure, water management and systems.

Following this last approach with slight modifications, we have classified the erosion control measures into the following groups (Table 1).



Table 1. Erosion control measures subsidized by CAP Strategic Plans.

Soil management
Cover crops
Catch crops
Cover crops
Mulch
Alternative plant protection for horticulture crops
Inert crops
Mulch-no till
Vegetation cover during winter
Soil organic
Promoting circular economy
Soil organic carbon in arable land
Soil surface roughness
Micro-dams between ridges
Tillage management
No till strip till
No tillage
Reduced tillage (incl strip-till and direct sowing) with soil cover (sufficient crop residues)
Vegetation management
Crop rotation, crop diversification
Annual environmental crops
Annual protein crops
Crop rotation
Crop rotation with legumes
Cultivation of biodiversity plants
Eco crops
Grassland for green fertilization
Soil improvement by restoration plants
Perennial crops
Perennial protein crops
Buffering
<hr/>
Buffering
Buffering measures
Buffer riparian zones
Buffer strips
Grass buffer strips
Hedges and hedgerows
Vegetated waterways
Structural
Walls
Water management
Sediment retention ponds/wetlands
Wetland management
Wetland restoration and sedimentation ponds
Terracing
Terrace
Land use changes
<hr/>
Land use
Agroforestry
Maintenance of agroforestry
Land use changes
Forestation
Temporary to permanent grassland
Permanent grassland
Conservation ecologically managed grassland
Conservation of perennial grassland



2.3 Opportunities and limitations of this approach

The data collected from the different countries involved in the SCALE Project are the subsidies offered to the farmers for the implementation of ECMs through the CAP. These subsidies are not always estimated based on real cost of implementing the actions but are often provided at a flat rate. Real cost calculations should include one-off direct costs for establishing the measures but also account for the yield losses and the opportunity costs resulting from devoting land to uses other than main crop; the maintenance costs spread over the validity period, and occasionally, the transaction costs that fall on land managers.

Thus, subsidies can be considered a proxy for the real local cost and it will give us a picture of the CAP's financial support for the implementation of ECM across Europe. However, the data collected were not sufficient to conduct a quantitative analysis but to reflect a description of the range of costs.

3 Results

As indicated in the section of methods we assume that subsidies paid by the CAP to the adoption of ECMs are a reliable proxy of the local costs for implementing them. Thus, in this section we use the terms cost and subsidies interchangeably.

The data and information regarding ECMs subsidized by CAP Strategic Plan collected by the SCALE partners are shown in the Supplementary Material. For the following analysis we only use the data from those countries where a focus groups discussion with stakeholders of pilot catchments were held. Measures that are subsidized only for quite specific locations (e.g. islands) are not considered in the analysis.

3.1 Local costs by type of erosion control measures

Figure 1 shows the values of the subsidies paid by national CAP Strategic Plans for erosion control measures categorized under different groups. The agronomic measures (comprising soil management and vegetation management practices) are the most numerous, with 31 and 11 measures falling under these respective categories. These measures are also less costly, with average cost of 176 €/ha and 342 €/ha, respectively. Eleven of the subsidized measures are categorized as buffering measures with an average cost of 632.5 €/ha. The eight measures related to land use transformation and the management of land uses other than arable land have an average cost of 521 €/ha. Measures dealing with water management show a great disparity in costs, ranging from low-cost measures such as terracing (56.1 €/ha) to high-cost measures to restore and manage wetlands and build sediment retention ponds in Finland (500 €/ha) and Denmark (11000 €/ha).



Cost (€/ha) by measures type

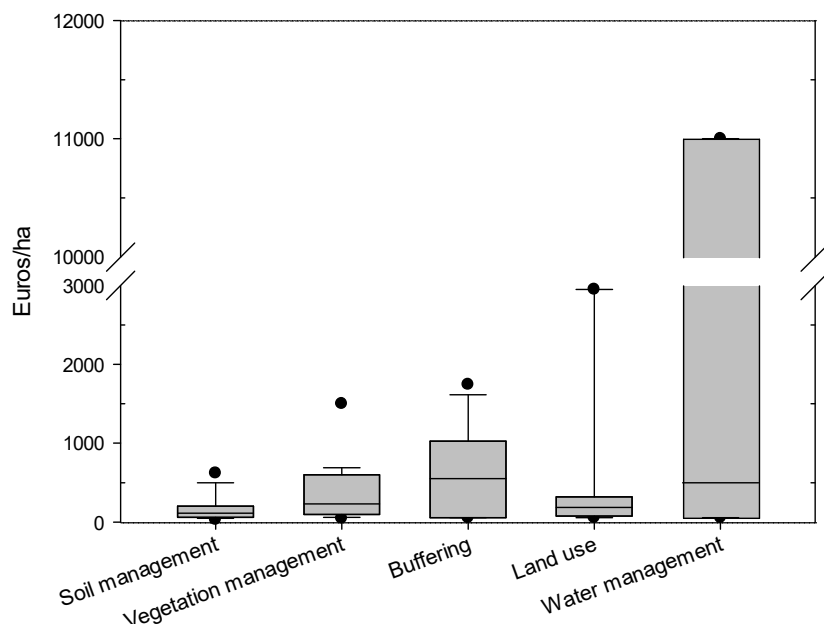


Figure 1. CAP subsidies by groups of erosion control measures.

We gain deeper knowledge about the costs of ECMs by zooming in on the main clusters, in particular those that were identified in the pilot areas as the preferable by stakeholders (see results of the focus groups meeting in the document of SCALE WP5-D3).

As regards soil management practices (Figure 2), planting cover crops have an average cost of 242 €/ha. The differences observed in the range of the local cost for cover crops are linked to physiographic conditions, crop type and farming systems. The highest costs are associated to steeper terrains, more profitable crops (woody crops) and less intensive (organic) farming systems.

Practices oriented toward reducing tillage and covering soil surface with vegetative and inert mulches cost on average 124 €/ha, ranging from 48 to 500 €/ha. Likewise, the cost of cover crops, the varying costs of mulching/tillage depend on topographic characteristics and crop type and profitability. This average value (the median value is 80 €/ha) is highly influenced by the subsidies provided in Finland for mulching practices in perennial horticulture plant that amount up to 500 €/ha.

Cost of soil management practices

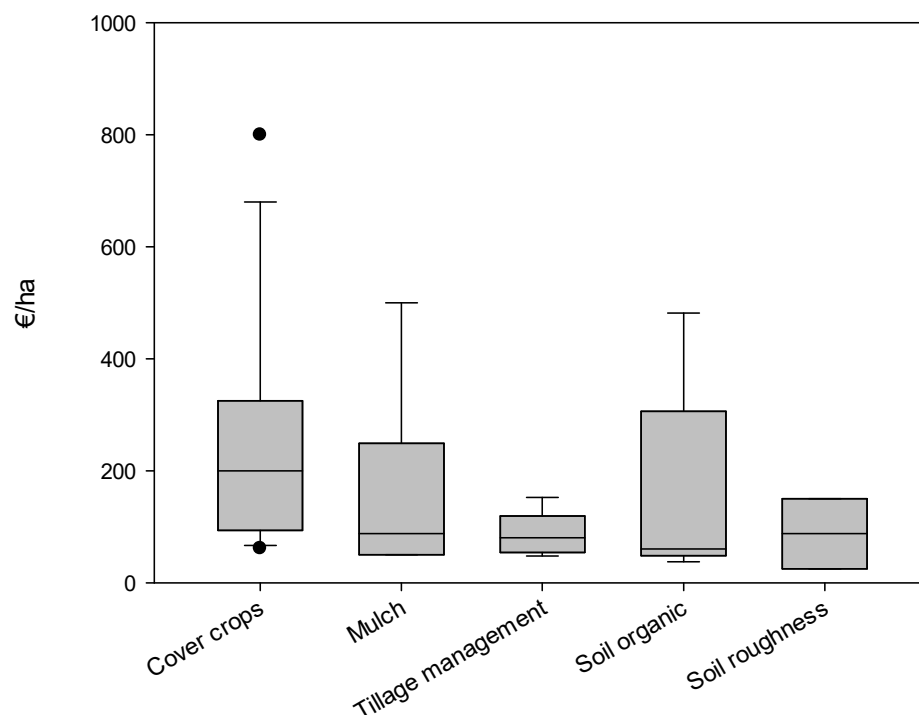


Figure 2. CAP subsidies by soil management practices.

The costs of the practices aimed at increasing soil organic matter through the addition of exogenous organic material vary from 37 to 483 €/ha (with an average cost of 154 €/ha) depending on the type of material used (compost, manure, others). Finally, the measures oriented to increase the soil roughness by building earth micro-dams between crops' inter-lines cost on average 87.5 €/ha showing a great disparity from 25 to 150 €/ha depending of the country applied (Belgium/Flanders and Austria, respectively).

The subsidized vegetation management practices for controlling soil erosion are those that promote crop diversification and rotation with soil-enhancing and eco-smart crops, and those intended to install permanent crops (Table 2). The crop diversification and rotation practices have an average cost of 332 €/ha showing a wide range of values (from 48 to 1550 €/ha with a median value of 114 €/ha) according to the farming systems (dry or irrigated) and requirements (with and without harvesting) or the objectives of soil-enhancing and eco-crops. The implementation of permanent crops has a similar average cost 382 €/ha with less variation (100 to 600 €/ha). Higher costs are associated with the cultivation of non-legumes such as grasses and herbs or to short-rotation forestry, while the lowest ranges refer to the cost of legume permanent crops.

The erosion control measures more oriented to mitigate the off-site impacts and reduce runoff and sediment flow connectivity are those grouped within the buffering cluster. It encompasses buffer and vegetated strips, hedgerows and vegetated waterways. The average cost of the 10 measures subsidized in the analysed countries is 690 €/ha. However, the dispersion of the costs



is high varying according to the considered country from 1745 to 54 €/ha, with a median value of 141 €/ha (Table 2).

Finally, CAP also subsidized some measures concerning land use changes and management to reduce soil erosion (Table 2). Regarding land use changes, the costs of measures are 2950, 325 and 54 €/ha for forestation, the transformation from temporary to permanent pasture and leaving cultivated arable land fallow, respectively. The average cost for the maintenance and adoption of sustainable management of land uses that minimize erosion risk (agroforestry and grassland) is 167 €/ha.

Table 2. Summary of the subsidies for erosion control practices included in CAP Strategic Plans.

	Number of measures	Average (€/ha)	Maximum	Minimum
Buffering				
Buffering measures	10	690.1	1745.0	54.0
Structural (walls)	1	56.1	56.1	56.1
Land use				
Agroforestry	1	270.0	270.0	270.0
Land use changes	2	1637.5	2950.0	325.0
Permanent grassland	4	141.8	300.0	65.0
Set aside	1	54.0	54.0	54.0
Soil management				
Cover crops	13	242.5	800.0	61.1
Mulch/Tillage management	11	124.1	500.0	47.7
Soil organic	5	153.8	482.0	37.0
Soil surface roughness	2	87.5	150.0	25.0
Vegetation management				
Crop rotation, crop diversification	14	332.4	1500.0	47.7
Perennial crops	4	382.5	600.0	100.0
Water management				
Sediment retention ponds/wetlands	2	5750.0	11000.0	500.0
Terracing	1	56.1	56.1	56.1

3.2 Local costs by country

Table 3 summarizes the local cost by countries for each group of erosion control measures. A detailed analysis by countries is described below.



Table 3. Subsidies for erosion control measures by country.

	Number of measures	Average*	Maximum	Minimum
Austria	13	272.7 €	800.0 €	50.0 €
Buffering				
Buffering measures	1	550.0 €	550.0 €	550.0 €
Soil management				
Cover crops	9	301.7 €	800.0 €	75.0 €
Mulch/Tillage management	2	65.0 €	80.0 €	50.0 €
Soil surface roughness	1	150.0 €	150.0 €	150.0 €
Belgium/Flanders	28	467.0 €	1745.0 €	25.0 €
Buffering				
Buffering measures	5	1167.0 €	1745.0 €	945.0 €
Land use				
Agroforestry	1	270.0 €	270.0 €	270.0 €
Land use changes	1	325.0 €	325.0 €	325.0 €
Permanent grassland	3	167.3 €	300.0 €	100.0 €
Soil management				
Mulch/Tillage management	1	60.0 €	60.0 €	60.0 €
Soil organic	4	183.0 €	482.0 €	60.0 €
Soil surface roughness	1	25.0 €	25.0 €	25.0 €
Vegetation management				
Crop rotation, crop diversification	8	474.8 €	1500.0 €	60.0 €
Perennial crops	4	382.5 €	600.0 €	100.0 €
Denmark	4	3514.5 €	11000.0 €	54.0 €
Buffering				
Buffering measures	1	54.0 €	54.0 €	54.0 €
Land use				
Land use changes	1	2950.0 €	2950.0 €	2950.0 €
Set aside	1	54.0 €	54.0 €	54.0 €
Water management				
Sediment retention ponds/wetlands	1	11000.0 €	11000.0 €	11000.0 €
Finland	10	216.9 €	500.0 €	37.0 €
Buffering				
Buffering measures	1	350.0 €	350.0 €	350.0 €
Land use				
Permanent grassland	1	65.0 €	65.0 €	65.0 €
Soil management				
Cover crops	1	97.0 €	97.0 €	97.0 €
Mulch/Tillage management	2	275.0 €	500.0 €	50.0 €
Soil organic	1	37.0 €	37.0 €	37.0 €
Vegetation management				
Crop rotation, crop diversification	3	190.0 €	300.0 €	80.0 €
Water management				
Sediment retention ponds/wetlands	1	500.0 €	500.0 €	500.0 €



Spain	16	92.2 €	165.2 €	47.7 €
Buffering				
Buffering measures	2	56.1 €	56.1 €	56.1 €
Structural (walls)	1	56.1 €	56.1 €	56.1 €
Soil management				
Cover crops	3	113.4 €	165.2 €	61.1 €
Mulch/Tillage management	6	104.3 €	165.2 €	47.7 €
Vegetation management				
Crop rotation, crop diversification	3	95.1 €	152.0 €	47.7 €
Water management				
Terracing	1	56.1 €	56.1 €	56.1 €

* In case the subsidies comprise a range of values for a specific crop type, the values in the table represent the average.

3.2.1 Austria

The primary measures subsidized by the CAP in Austria are related to the use of cover crops. Subsidies for these range from 75 to 800 €/ha, with an average of 302 €/ha. The cost of these measures varies depending on the main crops, terrain characteristics, and farming systems. Cover crops in arable lands, subjected to both conventional and organic farming systems, fall within the lower cost range of 75-90 €/ha. Conversely, the highest cost range of 180-800 €/ha is observed in vineyards and vineyard terraces, reflecting the differences in slope terrain. Other subsidized measures in Austria under the CAP include promoting mulching and reduced tillage practices at an average cost of 65 €/ha, increasing soil surface water storage through micro-dams in inter-line furrows (150 €/ha), and constructing vegetated waterways (550 €/ha).

3.2.2 Belgium/Flanders

CAP subsidies in Flanders encompass a broad range of erosion control measures. Subsidies for supplying exogenous organic matter to enhance soil organic carbon content range from 60 to 482 €/ha, with an average of 183 €/ha. Other subsidized soil management practices include adopting reduced tillage (60 €/ha) and building micro-dams in furrow to increase soil roughness and depressional water storage (25 €/ha). Several measures focus on vegetation management, including crop diversification with environmentally, biodiversity, and climate-friendly crops (subsidized within a range of 60 to 1500 €/ha, averaging 475 €/ha) and planting of permanent crops (382 €/ha on average, varying from 100 to 600 €/ha).

Buffer strip establishment is subsidized with an average of 1167 €/ha, though the value varies from 945 to 1745 €/ha depending on functionality and composition. Other measures promote transforming arable lands into permanent grasslands and the sustainable management of existing permanent grasslands, with subsidies ranging from 100 to 300 €/ha according to the grazing system. The transformation from temporary to permanent grassland is funded with 325 €/ha. Regarding land use changes, maintaining agroforestry systems is subsidized with 270 €/ha.



3.2.3 Denmark

In Denmark, CAP subsidies are tied to land use changes. These include set-aside measures, where farmers receive 54 €/ha to maintain arable land in fallow, as well as the transformation of arable land into permanent forest, which is subsidized on average by 2950 €/ha. Additionally, other subsidized CAP measures include the establishment of buffer strips (54 €/ha) and the restoration of wetlands, along with the construction of sediment ponds, which are subsidized with 11000 €/ha.

3.2.4 Finland

The CAP Strategic Plan in Finland encompasses subsidies for a variety of erosion control measures. Improving soil conditions through crop rotation and diversification measures such as green manure fertilization, the establishment of deep-rooted plants, or the cultivation of plants that preserve and increase biodiversity is subsidized on average by 190 €/ha, with a range from 80 to 300 €/ha. Soil management measures subsidized by the CAP aim to protect the soil surface through the implementation of cash crops (97 €/ha), maintaining vegetated or stubble cover during winter (averaging 50 €/ha), or inert material in horticulture crops (300 €/ha). Additionally, the increase of soil organic carbon by applying exogenous organic matter is also subsidized by 37 €/ha. Other measures regarding the establishment and management of buffer and riparian zones are subsidized at 350 €/ha. The management of wetlands (500 €/ha) and permanent grasslands (averaging 65 €/ha) are also considered by the Finnish CAP.

3.2.5 Spain

The value of subsidies in the Spanish CAP Strategic Plan are heavily conditioned by factors such as the farming system (dry-farming or irrigated), climatic conditions (precipitation), and physiographic characteristics (terrain slope). These factors aim to reflect production losses (which are higher in irrigated crops and wetter regions) and the increasing costs (higher in steeper terrain) associated with implementing ECMs.

The measures related to soil management include the establishment and management of cover crops, inert mulches, and the adoption of non-tillage practices. Subsidies for these measures average at 113 €/ha (ranging from 61 to 165 €/ha) and at 104 €/ha (ranging from 48 to 165 €/ha) for mulch and non-tillage practices, respectively.

Another agronomic measure included in the Spanish CAP is crop rotation and diversification, which is subsidized at an average of 95 €/ha (ranging from 48 to 142 €/ha). Additionally, a series of measures such as buffer strips, hedgerows, and stone walls (“bancales”) are intended to reduce water and sediment connectivity, and they are subsidized with an average of 56 €/ha.



4 Discussion

In this section we compare the results obtained from CAP subsidies with those shown in the recent literature and obtained from other sources. All costs have been updated to current (2023) values accounting for the average inflation rate for the Euro-zone.

There is still little evidence of the cost of measures needed to meet the environmental objectives in rural development programmes and agricultural policies. Some studies have been conducted but most of them rely, like ours, on the value of CAP subsidies, while more detailed information is only available for case studies or regional analysis. The most comprehensive study of the cost of measures to preserve and protect soil resources is that conducted by Kuhlman et al. (2010) as part of the Impact Assessment of the European Soil Thematic Strategy. They provide an estimation of the costs of erosion control measures depending of erosion risk of the location (Table 4). Additionally, Hart et al. (2011) give a more detailed information on the cost of erosion control measures based on a case study of the Murcia Region in SE of Spain. It is estimated that addressing soil erosion and organic matter decline require an annual cost of, on average, 489 €/ha plus a one-off cost of 340 €/ha. Through a systematic literature review of cost and benefits of soil protection and sustainable management practices in some European countries, Tepes et al. (2021) estimated a mean average cost of 106 €/ha/year with high variability in the costs ranging from 0 to 7765 €/ha.

Table 4. Cost of erosion control measures (Kuhlman et al., 2010).

Type of Measure	Measure	Cost (€/ha) ¹	Range	Observations
Soil management	Contour tillage	19		
	Stubble mulch	77		
	Inert mulch	174		
	Green manure	56		
	Addition exogenous organic matter	562		
Buffering	Buffer strips	157	23-277	Depending on slope
	Hedgerows	415		
Land use changes	Fallow	42		
	Non-cultivated fringes	19		
	Forestation	4671		
Water management	Terracing	3042	2377-3706	

¹ Original costs for 2011 have been updated to 2023.

Table 5 shows a summary of the erosion control measures as reported in the revised bibliography (the full dataset can be found in the Annex). Because of highly skewed values, the comparison with the value of CAP subsidies obtained through the SCALE survey has been based on median values (Figure 3).



Table 5. Overview of costs for erosion control measures from selected references.

	Number of practices	Average	Maximum	Minimum
Buffering	6	231	415	80
Buffering	6	231	415	80
Cover crops	9	156	396	83
Cover crops	9	156	396	83
Land use change	5	1078	4671	19
Land use change	5	1078	4671	19
Mulch/tillage	23	352	2341	19
Mulch	5	89	174	64
Mulch/tillage	4	283	409	157
Tillage	14	466	2341	19
Soil organic matter	4	382	616	56
Soil organic matter	4	382	616	56
Water management	2	2315	3042	1588
Water management	2	2315	3042	1588
Overall	49	458	4671	19

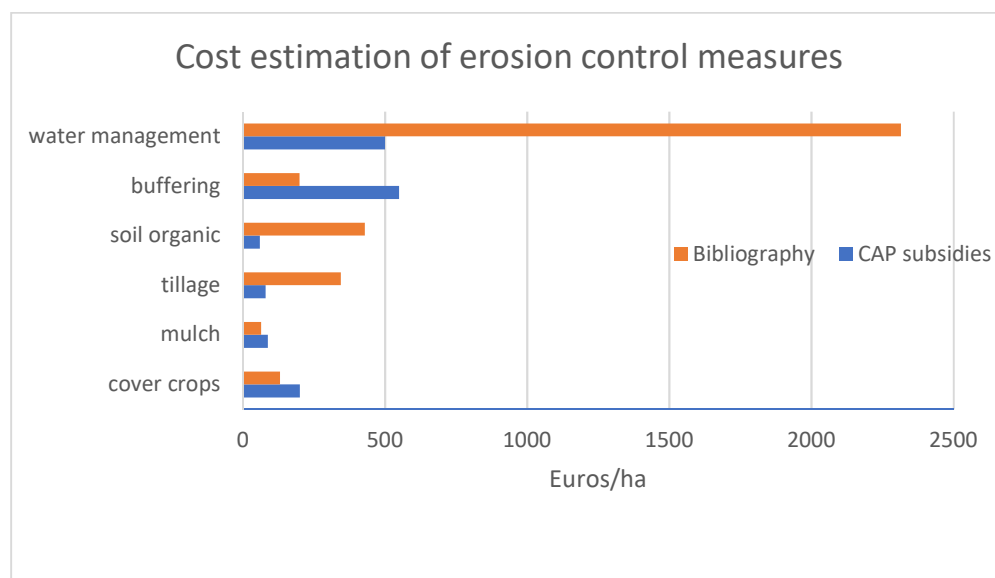


Figure 3. Comparative analysis of the cost of erosion control measures (median values).

Overall, CAP subsidies generally show lower costs for tillage, soil organic, and water management practices compared to the bibliography. Conversely, cover crops, mulch, and buffering are more expensive in CAP subsidies compared to the bibliography.

These results contrast with some conclusions in studies conducted in Southern Europe on the efficiency of erosion control measures. De Leijster et al. (2020), analysing the profitability of almond crops in Mediterranean semiarid areas of Spain, pointed out that the CAP greening



payments should be 5-7% higher than current payments. The opportunity costs of implementing conservation agriculture with erosion control measures could be compensated with 20% price premium combined with an additional 70% of CAP greening payments. Also, Martin-Gorriz et al. (2020) showed that almond crops are not profitable in semiarid areas without being subsidized by CAP. These authors highlighted the reduction in farms profitability associated to yield losses when adopting no-tillage practices in a severely water-limited environment, which can raise costs up to 1862 €/ha. Schütte et al. (2020) studied the profitability of erosion control measures with cover crops in vineyards in two regions in Spain and Austria. They conclude that the cost of adopting cover crops in vineyards outweighs the private benefits, so only when on-site and off-site costs are accounted for, nature-based solutions are cost-effective.

To determine the value of subsidies to be paid for farmers to implement ECMs, the benefits derived from enhancing the provision of ecosystem services need to be valued. Galati et al. (2015) analysed the incentives for adopting agri-environmental measures (AEM) in degraded and eroded vineyards in Sicily (Italy). The adoption of cover crops implies a loss of income of 315 €/ha. On the other hand, the ecosystems service benefits, measured as the difference in the replacement costs due to reduced soil erosion, amount to 1085 €/ha. They concluded that the minimum incentives to be paid to farmers should compensate the loss of income, while the maximum should reflect the benefit of ecosystems services generated.

The valuation of ecosystems services provided by the adoption of erosion control as societal benefits can exceed the market values of crop yields. Alcon et al. (2020) estimated that the willingness to pay for ecosystems services provided by intercropping diversified management of monocultures croplands (rainfed dry farming and both low-efficient and high-efficient irrigated intercropping systems in irrigated citrus) in Murcia region are higher (940;1148;1362 €/ha/year, respectively) than revenues in the market, especially for almond dry farming (500 €/ha/year, annual gross margin).

Adopting conservation and erosion control practices does not only rely on economic aspects but also on a combination of factors, including the farmers' perceptions. Cerdà et al. (2022) showed how citrus-orange farmers in Valencia (Spain) consider the use of interlining catch crops as a dirty, careless practice whose implantation should be subsidized by 131,17 €/ha not only to compensate for additional costs but also the "bad reputation" among farm-mates.

The main conclusion of these studies is that even though CAP subsidies can cover direct costs of implementing erosion control measures they are not enough to incentivize farmers to adopt these practices. It also highlights the need for more detailed information on cost for specific farming situations (including potential yield losses), since they can vary widely within countries and cropping systems depending on features like, farming size, topographic conditions or remoteness.



5 Conclusions

This report underscores the necessity of socio-economic information on sustainable land management and soil protection to inform decisions and policy incentives for erosion control measures (ECMs). The study estimates the local costs of ECMs using agri-environmental payments from the Common Agricultural Policy (CAP) as a proxy, providing insights into subsidies for various ECMs across different countries. The report categorizes ECMs into agronomic, buffering, structural, land use, and water management measures, and discusses their respective costs, revealing significant variability depending on regional factors, farming systems, and specific practices.

The findings indicate that agronomic measures, such as soil and vegetation management, are the most commonly subsidized and generally less costly, while water management measures exhibit the greatest cost disparity. The report also contrasts the CAP subsidies with other studies, finding lower costs for some practices like tillage and soil organic management but higher costs for cover crops and buffering measures. This suggests a need for more accurate, locally based, cost assessments to ensure effective financial support and adoption of ECMs. This cost assessment should include a realistic evaluation of potential yield losses, as well as increasing cost by features often neglected like, for instance, overtime in related farming operations. Overall, the report provides a comprehensive overview of ECM costs, aiding in the promotion and implementation of sustainable land management practices at the farm level.



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Appendix

Annex I: Cost of erosion control measures drawn from selected bibliography

Type	Type_2	Erosion control measure	Cost	Year	Updated cost	Observations	Source
Cover crops	Cover crops	Temporary cover crops.Spain	66	2016	83	Vineyards	Schütte et al. (2020)
Cover crops	Cover crops	Permanent cover crops. Spain	126	2016	158	Vineyards	Schütte et al. (2020)
Cover crops	Cover crops	Temporary cover crops. Austria	122	2016	153	Vineyards	Schütte et al. (2020)
Cover crops	Cover crops	Permanent cover crops. Austria	189	2016	238	Vineyards	Schütte et al. (2020)
Cover crops	Cover crops	Catch crops	131	2020	131	Citrus farming. Subsidy that farmers would accept for implementing cash crops.	Cerda et al. 2022
Soil organic matter	Soil organic matter	Organic farming (but not always together ECMs)	235	2015	296	Almond. CAP's subsidy	Martin-Gorritz et al. 2020
Mulch/tillage	Tillage	Reduced tillage plus green manure	274	2015	345	Estimated as difference in benefits between conventional and erosion control measures	Martin-Gorritz et al. 2020
Mulch/tillage	Tillage	Non-tillage	1862	2015	2341	A sharp decreased in almond yield	Martin-Gorritz et al. 2020
Mulch/tillage	Tillage	Reduced tillage	24	2015	30		Martin-Gorritz et al. 2020
Mulch/tillage	Tillage	Non-tillage	711	2016	894	Opportunity cost in almond farming	De Leijster et al. 2020
Soil organic matter	Soil organic matter	Green manure	490	2016	616	Opportunity cost in almond farming	De Leijster et al. 2020
Cover crops	Cover crops	Cover crops	315	2016	396	Opportunity cost (loss of income) in eroded vineyard	Galati et al., 2015
Mulch/tillage	Mulch/tillage	Transition from conventional to conservation agric	175	2015	220	Transaction costs in small farms in South Italy	Trocloi et al. 2015
Mulch/tillage	Mulch/tillage	Transition from conventional to conservation agric	125	2015	157	Transaction costs in big farms in South Italy	Trocloi et al. 2015
Mulch/tillage	Mulch/tillage	Transition from conventional to conservation agric	325	2015	409	Transaction costs in small farms in South Italy located on high environmatl risk areas	Trocloi et al. 2015
Mulch/tillage	Mulch/tillage	Transition from conventional to conservation agric	275	2015	346	Transaction costs in small farms in South Italy located on high environmental risk areas	Trocloi et al. 2015
Mulch/tillage	Tillage	Contour tillage			19	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Mulch/tillage	Mulch	Stubble mulch			77	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Mulch/tillage	Mulch	Inert mulch			174	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Soil organic matter	Soil organic matter	Green manure			56	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Soil organic matter	Soil organic matter	Addition exogenous organic matter			562	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Buffering	Buffering	Buffer strips			157	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Buffering	Buffering	Hedgerows			415	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Land use change	Land use change	Fallow			42	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Land use change	Land use change	Non-cultivated fringes			19	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Land use change	Land use change	Forestation			4671	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Water management	Water management	Terracing			3042	Case study of implementation of erosion contro measures in Murcia region	Hart et al., 2011
Buffering	Buffering	Eorsion controll measures to reduce muddy flows			80	Case study of implementation of erosion contro measures in Flanders	Boardaman et Vandale (2006)
Mulch/tillage	Tillage	Contour farming			100	CAP's subsidy	Ricci et al., 2020
Mulch/tillage	Tillage	No tillage			322	Cap's subsidy	Ricci et al., 2020
Mulch/tillage	Tillage	Contour farming			717	Production cost slope < 20%	Ricci et al., 2020
Mulch/tillage	Tillage	No tillage			699	Production cost slope < 20%	Ricci et al., 2020
Mulch/tillage	Tillage	No tillage			764	Production cost slope >20%	Ricci et al., 2020
Land use change	Land use change	Conversion of arable land to forest	299	2006	434	Land affected by serious erosion (>10 t/ha/year)	Kulhman et al., 2010
Land use change	Land use change	Conversion of arable land to pasture	155	2006	225	Land affected by serious erosion (>10 t/ha/year)	Kulhman et al., 2010
Water management	Water management	Terracing	1093	2006	1588	Land affected by serious erosion (>10 t/ha/year)	Kulhman et al., 2010
Buffering	Buffering	Buffer strips	230	2006	334	Land affected by serious erosion (>10 t/ha/year)	Kulhman et al., 2010
Mulch/tillage	Mulch	Residue management	44	2006	64	Land affected by serious erosion (>10 t/ha/year)	Kulhman et al., 2010
Mulch/tillage	Tillage	Conservation tillage	59	2006	86	Land affected by serious erosion (>10 t/ha/year)	Kulhman et al., 2010
Cover crops	Cover crops	Cover crops	57	2006	83	Land affected by serious erosion (>10 t/ha/year)	Kulhman et al., 2010
Buffering	Buffering	Buffer strips	125	2006	182	Land affected by moderate to serious erosion (2-10 t/ha/year)	Kulhman et al., 2010
Mulch/tillage	Mulch	Residue management	44	2006	64	Land affected by moderate to serious erosion (2-10 t/ha/year)	Kulhman et al., 2010
Mulch/tillage	Tillage	Conservation tillage	59	2006	86	Land affected by moderate to serious erosion (2-10 t/ha/year)	Kulhman et al., 2010
Cover crops	Cover crops	Cover crops	57	2006	83	Land affected by moderate to serious erosion (2-10 t/ha/year)	Kulhman et al., 2010
Buffering	Buffering	Linear elements	150	2006	218	Land affected by moderate erosion (0,5-2 t/ha/year)	Kulhman et al., 2010
Mulch/tillage	Tillage	Contour ploughing	20	2006	29	Land affected by moderate erosion (0,5-2 t/ha/year)	Kulhman et al., 2010
Mulch/tillage	Mulch	Residue management	44	2006	64	Land affected by moderate erosion (0,5-2 t/ha/year)	Kulhman et al., 2010
Mulch/tillage	Tillage	Conservation tillage	59	2006	86	Land affected by moderate erosion (0,5-2 t/ha/year)	Kulhman et al., 2010
Cover crops	Cover crops	Cover crops	57	2006	83	Land affected by moderate erosion (0,5-2 t/ha/year)	Kulhman et al., 2010



Supplementary material

Subsidies for erosion control measures included in the CAP Strategic Plans

Specific subsidies for erosion control measures in Austria

Measure	On-site Off-site measure	Disconnection measure (Y/N)	Territorial scope	Funded through Eco-schemes (Y/N)	Land use	Requirement	Crops	Subsidy (€/ha)	Subsidy range ¹ (€/ha)
Mulch-till	On-site	No	National	No	Arable land	Minimum 0.1 ha; combination obligation with "Greening of arable land - intercropping" or "Greening of arable land - evergreen system" at the same time.	Broad bean, potato, pumpkin, maize, beet, soybean, sunflower, sorghum	50	-
No-till or strip-till	On-site	No	National	No	Arable land	Minimum 0.1 ha; combination obligation with "Greening of arable land - intercropping" or "Greening of arable land - evergreen system" at the same time.	Broad bean, potato, pumpkin, maize, beet, soybean, sunflower, sorghum	80	-
Cover crops	On-site	No	National	No	Arable land	Minimum 0.1 ha	Broad bean, pumpkin, soybean, sunflower	75	-
				No	Arable land participating in the measure "organic farming"	Minimum 0.1 ha	Broad bean, pumpkin, soybean, sunflower	90	-
				Yes	Vineyards (< 25 % slope)	Minimum 0.5 ha; year-round cover	Wine		180-220
				Yes	Vineyards and vineyard terraces (25 - < 35 % slope)	Minimum 0.5 ha; year-round cover (terraces exempt)	Wine		270-330
				Yes	Vineyards and vineyard terraces (35 - < 50 % slope)	Minimum 0.5 ha; year-round cover (terraces exempt)	Wine		450-550
				Yes	Vineyards and vineyard terraces (> 50 % slope)	Minimum 0.5 ha; year-round cover (terraces exempt)	Wine		720-880
				Yes	Fruit orchards (< 25 % slope)	Minimum 0.5 ha; year-round cover	Fruit		180-220
				Yes	Fruit orchards (> 25 % slope)	Minimum 0.5 ha; year-round cover	Fruit		315-385
				Yes	Hops fields	Minimum 0.5 ha; year-round cover	Hops		180-220
Micro-dams	On-site	Yes	National	No	Arable land	Minimum 0.1 ha; max 2 m between dams	Potato	150	-
Vegetated waterways	On-site	Yes	National	No	Arable land	Minimum 0.1 ha; may not exceed four times the area of the erosion prone area.	Not specified	550	-

¹ Subsidy range depending on the area applied for and available funds, minimum amount is guaranteed.



Estimation of local costs for different mitigation measures based on the CAP Strategic Plan (2023-2027): Belgium, region of Flanders

Measure	On-site Off-site measure	Disconnection measure (Y/N)	Territorial scope	Funded through Eco- schemes (Y/N)	Land use	Requirement	Crops	Subsidy ¹ (€/ha)	Subsidy range (€/ha)
1.5 – Conservation of perennial grassland 1.5.1 Conservation of perennial grassland (10-15y) and (> 15y)	On-site	Y	Regional	Y	grassland	100%	grassland	102.00	92.00- 137.50
1.6 – Ecologically managed grassland 1.6.1 Conservation ecologically managed grassland - action 1 – ecologically managed grassland – planned subsidy per ha	On-site	Y	Regional	Y	grassland	100%	grassland	300.00	270.00- 360.00
1.6 - Ecologically managed grassland 1.6.2 Conservation ecologically managed grassland - with grazing of max. 2 LU/ha – action 2 – supplementary subsidy per ha	On-site	Y	Regional	Y	grassland	100%	grassland	100.00	90.00- 120.00
1.7 – Eco-scheme soil organic carbon in arable land 1.7.1 – Soil organic carbon in arable land – supply of EOC	On-site	N	Regional	Y	arable land	100%	arable land – not specified	115.00	103.50-138.00
1.7 - Eco-scheme soil organic carbon in arable land 1.7.2.1 - Soil organic carbon in arable land - action 2a – use of products with high carbon content, in particular compost	On-site	N	Regional	Y	arable land	100%	arable land – not specified	130.00	117.00-130.00
1.7 - Eco-scheme soil organic carbon in arable land 1.7.2.2 - Soil organic carbon in arable land - action 2b – use of products with high carbon content, in particular farmyard manure	On-site	N	Regional	Y	arable land	100%	arable land – not specified	60.00	54.00-72.00
1.7 - Eco-scheme soil organic carbon in arable land 1.7.2.3 - Soil organic carbon in arable land - action 2c – use of products with high carbon content, in particular wood chips	On-site	N	Regional	Y	arable land	100%	arable land – not specified	482.00	433.80- 482.00
1.7 - Eco-scheme soil organic carbon in arable land 1.7.3 – Eco-scheme soil organic carbon in arable land - action 3 – result oriented	On-site	N	Regional	Y	arable land	100%	arable land – not specified	60.00	54.00- 60.00



1.8 - Cultivation of environment, biodiversity and/or climate friendly crops 1.8.1 – Eco-crops – action 1 – annual protein crops	On-site	N	Regional	Y	arable land	100%	arable land – specified in subject	600.00	540.00-600.00
1.8 - Cultivation of environment, biodiversity and/or climate friendly crops 1.8.2.1 Eco-crops – action 2a – annual environmental crops with harvesting	On-site	N	Regional	Y	arable land	100%	arable land – specified in subject	230.00	207.00-276.00
1.8 - Cultivation of environment, biodiversity and/or climate friendly crops 1.8.2.2 Eco-crops – action 2b – annual environmental crops without harvesting	On-site	N	Regional	Y	arable land	100%	arable land – specified in subject	600.00	540.00-720.00
1.8 - Cultivation of environment, biodiversity and/or climate friendly crops 1.8.3.1 Eco-crops – action 3a – summer cereals	On-site	N	Regional	Y	arable land	100%	arable land – specified in subject	350.00	315.00-420.00
1.8 - Cultivation of environment, biodiversity and/or climate friendly crops 1.8.3.2 - Eco-crops – action 3b – fauna mixture	On-site	N	Regional	Y	arable land	100%	arable land – specified in subject	1500.00	1350.00- 1800.00
1.8 - Cultivation of environment, biodiversity and/or climate friendly crops 1.8.3.3 Eco-crops – action 3c – spring fallow	On-site	N	Regional	Y	arable land	100%	arable land – specified in subject	350.00	315.00- 375.00
1.8 - Cultivation of environment, biodiversity and/or climate friendly crops 1.8.4 Eco-crops – action 4 – fauna friendly cover crops	On-site	N	Regional	Y	arable land	100%	arable land – specified in subject	60.00	54.00 -60.00
1.10 - Buffer strips 1.10.1 Buffer strips - action 1 – erosion	Off-site	Y	Regional	Y	-		-	1025.00	922.50- 1078.00
1.10 - Buffer strips 1.10.2.1 Buffer strips - action 2a – vulnerable landscape element	Off-site	Y	Regional	Y	-		-	1025.00	922.50- 1078.00
1.10 - Buffer strips 1.10.2.2 Buffer strips - action 2b – watercourse	Off-site	Y	Regional	Y	-		-	945.00	850.50- 949.00
1.10 - Buffer strips 1.10.3 Buffer strips - action 3 – grass and herbs	Off-site	Y	Regional	Y	-		-	1095.00	985.50- 1099.00
1.10 - Buffer strips 1.10.4 – Buffer strips - action 4 – mixture of flowers	Off-site	Y	Regional	Y	-		-	1745.00	1570.50- 1751.00
1.12 – Agronomic erosion mitigation measures 1.12.1 – Agronomic erosion mitigation measures - action 1- Micro-dams between ridges	On-site	N	Regional	Y	arable land	100%	arable land – specified in subject	25.00	22.50-25.00



1.12 - Agronomic erosion mitigation measures 1.12.2 - Agronomic erosion mitigation measures - action 2 : Reduced tillage (incl strip-till and direct sowing) with soil cover (sufficient crop residues)	On-site	N	Regional	Y	arable land	100%	arable land –not specified	60.00	54.00- 72.00
1.12 - Agronomic erosion mitigation measures 1.12.3 - Agronomic erosion mitigation measures - action 3- Widespread sowing of corn	On-site	N	Regional	Y	arable land	100%	arable land – specified in subject	25.00	22.50-25.00
1.13 - Eco-scheme Crop rotation with legumes	On-site	N	Regional	Y	arable land	100%	arable land	108.00	97.20-108.00
3.1 Temporary grassland to permanent grassland	On-site	Y	Regional	N	arable land	100%	grassland	325.00	325.00
3.2 Cultivation of environment, biodiversity and/or climate friendly crops									
3.2.1 Eco-crops – Action 1 perennial protein crops									
3.2.1.1 - Eco-crops - action 1a – perennial protein crops - legumes	On-site	N	Regional	N	arable land	100%	arable land – specified in subject	230.00	230.00
3.2.1.2 - Eco-crops - action 1b – perennial protein crops – grass and herbs	On-site	N	Regional	N	arable land	100%	arable land – specified in subject	600.00	600.00
3.2.1.3 - Eco-crops - action 1c – perennial protein crops – deferred alfalfa	On-site	N	Regional	N	arable land	100%	arable land – specified in subject	100.00	100.00
3.2.2 Eco-crops – Action 2 perennial crops with positive impact on environment, climate and/or biodiversity that are no legumes, e.g. short rotation forestry and miscanthus	On-site	N	Regional	N	arable land	100%	arable land – specified in subject	600.00	600.00
3.7 Maintenance of agroforestry	On-site	N	Regional	N	arable land	100%	arable land – specified in subject	270.00	270.00



Specific subsidies for erosion control measures in Denmark

Measure	On-site Off-site measure	Disconnection measure (Y/N)	Territorial scope	Funded through Eco-schemes (Y/N)	Land use	Requirement	Crops	Subsidy (€/ha)	Subsidy range ¹ (€/ha)
Fallow	On-site	No	National	(yes)		Funded by eco-scheme	Establishment of non-productive elements on 4-7% of the arable land (beyond conditionality requirement)	54	
Buffer strips	On-site	Yes	National	Yes/no		Funded in eco-schemes and statutory requirement	Fallow	54	
Wetland restoration and sedimentation dams	Off-site	Yes	National			Funded by cap pillar 2			11000
Forestation	On-site	No	National			Funded by cap pillar 2, at least 2 ha and the area will be permanently converted to "forest"	Trees (different subsidy depending on species)		2150-3750

Specific subsidies for erosion control measures in Finland

Measure	On-site Off-site measure	Disconnection measure (Y/N)	Territorial scope	Funded through Eco-schemes (Y/N)	Land use	Requirement	Crops	Subsidy ¹ (€/ha)	Subsidy range (€/ha)
ECO-Scheme 01 Vegetation cover during winter Talviaikainen kasvipeite, (erosion väh.)	On-site	No	National	Yes	Arable land + permanent horticultural crops	Vegetated or stubble-covered, no tillage October 31-April 15, permanent ley October 31- June 16 The minimum size of an eligible parcel is 0.05 ha	Long list of plants (excluding sugarbeet and potatoes)	50	40-60
ECO_Scheme 02 Nature management grasslands, Luonnonhoitopelto, (erosion vähentäminen)	On-site	No	National	Yes	Arable land	** Vegetation must be maintained until August 15. Mowing at least every two years.	Perennial grassland (max 20% nitrogen-fixing plants in the seed mixture of the plants). The old perennial multi-species stand with wild grasses,	65	50-80



						<p>Fertilization is prohibited, chemical plant protection permitted only for the purpose of terminating vegetation.</p> <p>Chemical plant protection prohibited in the year preceding the measure.</p> <p>Tillage is prohibited, except for the establishment and termination of vegetation.</p>	<p>herbaceous plants and perennial grasses is acceptable.</p>		
<p>Eco Scheme 03 Grassland for green fertilization</p> <p>Viherrannoitusnurmi (eroosion väh.)</p>	On-site	No	National	Yes	Arable land	<p>**</p> <p>Growing a mixture of grass and nitrogen fixing plants for green manure.</p> <p>Vegetation must be maintained until August 15</p> <p>Maximum 3 consecutive years on the same parcel.</p> <p>Fertilization is prohibited, chemical plant protection only allowed to terminate the vegetation.</p> <p>Chemical plant protection prohibited in the year preceding the measure.</p>	<p>Mixture of grass and nitrogen fixing plants. At least 20% of the weight of the seed mixture must be nitrogen-fixing plants. A minimum of 4 plant species required.</p>	80	65-95



						Tillage is prohibited, except for the establishment and termination of the crop.			
Eco-scheme 04: Biodiversity plants Monimuotoisuuskasvit (orgaanisen aineksen lisääminen)	On-site	No	National	Yes	Arable land	** Cultivation of biodiverse plants in four categories/uses: 1) wild pollinators and landscape 2) game,3) farmland birds and 4) meadow. Chemical plant protection prohibited. Fertilization is allowed only to establish vegetation. Tillage is prohibited, except for the establishment and termination of vegetation. Grazing is prohibited, vegetation must be maintained until September 30, except for game plants until August 1.	Long list of plants accepted in each category. Seed mixture must include 2 plant species from the list. Each plant category has its own list.	300	270-330
Env 02 – Soil improvement and restoration plants Maanparannus- ja saneerauskasvit (orgaanisen aineksen lisääminen)	On-site	No	Regional (Mainland Finland)	No* AECC	Arable land	The measure will be paid for a maximum of 20% of the eligible area. The annual plant must have grown in the year preceding the measure.	Deep rooted soil improvers and soil restoration plants in pure stands or mixtures.	190	



						Growing time at least 2 months required.			
AX MILJ 02 – Cultivation of soil-enhancing plants and remediation plants Odling av markförbättrande växter och saneringsväxter (organisen ainekseen lisääminen)	On-site	No	Regional (Åland islands)	No* AECC	Arable land	The annual plant must have grown in the year preceding the measure. >0.5 ha 2 kk:n kasvuaika?	Deep rooted soil improvers and soil restoration plants in pure stands or mixtures.	223	
Env 03 – Catch crops Kerääjäkasvi (erosion torjunta)	On-site	No	Regional (Mainland Finland)	No* AECC	Arable land	The maximum amount paid under the measure is 30% of the eligible area. Catch crops are sown with the main crop (not ley) or after main crop, sowing at the latest August 15, growing time at least 6 weeks	Italian ryegrass or other grass, clover or other herbaceous legume, a mixture of plants in which no more than 10% of flowering annual plants are allowed. May not contain only nitrogen-fixing plants. After annual horticultural crops and early potatoes, Phacelia, fodder radish/oil radish or tillage radish may be used as an intercrop. Cereals are also accepted after early potatoes and vegetables.	97	
AX MILJ 03 – Catch crop	On-site	No	Regional (Åland islands)	No* AECC	Arable land	Maximum area of the measure 1 ha	Not specified in the CAP plan.	109	



(Odling av fånggröda, erosion torjunta)						The maximum amount paid under the measure is 30% of the eligible area. Catch crops are sown with the main crop (not ley) or after main crop.			
Env 04 – Promoting circular economy Kiertotalouden edistäminen (orgaaninen aines) AX MILJ 05 – Promoting the circular economy (Främjande av cirkulär ekonomi, orgaanisen aineksen lisääminen)	On-site	No	Regional, mainland Finland, Åland islands	No* AECC	Arable land	The measure is paid on up to 80% of the eligible area of a farm in mainland Finland. Application of slurry, urine, liquid part of slurry after separation or liquid organic fertiliser on a parcel of arable land using placement or mulching equipment (> 15 m³/ha) or application of organic matter from outside the farm (dry matter content > 20 %, minimum 10 m ³ /ha). At least 5 m ³ /ha of specified material with high nutrient content is applied.	Not specified	37 Mainland Finland 75 Åland islands	
Env 05 – Env 05 – Protection zones: Establishment and management of the buffer zones/riparian zones	Off-site	Yes	Regional (Mainland Finland)	No* AECC	Arable land	The buffer zone must be maintained throughout the commitment period. Erosion-prone arable land along watercourses, groundwater and Natura 2000 sites, and	Perennial ley vegetation	350	



Suojavyöhykeet (eroosion torjunta)						edges of wetlands managed under environmental commitment. Along watercourses, 30-50 m wide buffer zone, distance of arable land from watercourses < 10 m. Vegetation to be harvested and removed annually by 31 August. Fertilisation, chemical plant protection and soil cultivation prohibited. Fertilisation is allowed at the time of establishment to ensure a good start to the crop. Herbicides may be used to control wild oats (<i>Avena fatua</i>) and other difficult weeds.			
AX MILJ 06 – Establishment of grass-covered protection zones Anläggning av gräsbevuxna skyddszoner (eroosion torjunta)	Off-site	Yes	Regional (Åland islands)	No* AECC	Arable land	In areas identified by the provincial government in the Buffer Zone Master Plan. Vegetation must be harvested and removed annually. No fertilisation or chemical plant protection.	Perennial ley vegetation	353	
Env 08 – Alternative plant protection for horticultural plants	On-site	No	Regional mainland Finland	NO* AECC	Arable land and permanent crops	Chemical control of weeds is prohibited	Not specified	500	



<p>Puutarhakasvien vaihtoehtoinen kasvinsuojelu (eroosion torjunta)</p> <p>AX MILJ 04 - Alternativa växtskyddsmetoder i trädgårdsodling</p>			Åland islands			<p>The soil surface of rows of annual horticultural plants should be covered with straw, wood chips or grass clippings, biodegradable film, paper cover or other organic material that is not harmful to the soil.</p> <p>The soil surface of rows of perennial horticultural plants shall be covered with straw, wood chips, grass clippings, biodegradable film, paper cover, cut grass or other organic material. The row spacing shall be covered with either cut grass or other organic cover that is not harmful to the soil. The cut grass cover in the row spacing may also be a flower strip. The whole parcel (row + row spacing) or only the row or row spacing may be covered. The cover must be sufficient throughout the growing season.</p> <p>The area covered may vary from year to year.</p>			
ENV 11- Wetland management	Off-site	Yes	Regional (Mainland Finland)	NO*	Non-agricultural land	>0.3 ha	Not specified	500	



<p>Kosteikkojen hoito (ravinnehuuhtoumien ehkäiseminen)</p>				<p>AECC</p>	<ul style="list-style-type: none"> - wetlands eligible for compensation - peatland parcel converted into wetland - area which is a floodplain, a natural two-stage channel and a natural channel - managed area surrounding the wetland 	<p>Management includes wetland management measures that maintain and enhance the functionality of the wetland, such as sediment removal, dam maintenance and water level regulation, monitoring the need for measures such as keeping the floodplain open, enhanced invasive species removal or grazing of wetland edges or mowing or harvesting and removal of vegetation.</p>			
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*) Agro-environment-climate commitments (AECCs)

**) Eco Scheme 02, 03, 04 maximum payment for the sum of area under measures is 25% of the area eligible for subsidises.



Specific subsidies for erosion control measures in Spain

Measure	On-site Off-site measure	Disconnection measure (Y/N)	Territorial scope	Funded through Eco-schemes (Y/N)	Land use	Requirement	Crops	Subsidy ¹ (€/ha)	Subsidy range (€/ha)
Crop rotation	On-site	No	National	Yes	Non-irrigated arable land (Annual rainfall < 650mm)	≥ 50% requested area	Not specified	47.67	24.63 – 105.56
					Non-irrigated humid arable land (Annual rainfall ≥ 650mm)	≥ 50% requested area	Not specified	85.72	46.02 – 114.07
					Irrigated arable land	≥ 50% requested area	Not specified	151.99	85.72 – 222.00
No tillage	On-site	No	National	Yes	Non-irrigated arable land (Annual rainfall < 650mm)	≥ 40% requested area	Not specified	47.67	24.63 – 220.00 ²
					Non-irrigated humid arable land (Annual rainfall ≥ 650mm)	≥ 40% requested area	Not specified	85.72	46.02 – 252.00 ²
					Irrigated arable land	≥ 40% requested area	Not specified	151.99	85.72 – 293.00 ²
Cover crops	On-site	No	National	Yes	Woody crops (< 5 % slope)	≥ 40% requested area	Woody crops	61.07	35.57 – 239.77 ²
					Woody crops (5 – 10 % slope)	≥ 40% requested area	Woody crops	113.95	69.59 – 263.54 ²
					Woody crops (> 10 % slope)	≥ 40% requested area	Woody crops	165.17	102.56 – 297.53 ²
Inert cover/mulch	On-site	No	National	Yes	Woody crops (< 5 % slope)	≥ 40% requested area	Woody crops	61.07	35.57 – 129.39
					Woody crops (5 – 10 % slope)	≥ 40% requested area	Woody crops	113.95	69.59 – 168.21
					Woody crops (> 10 % slope)	≥ 40% requested area	Woody crops	165.17	102.56 – 223.72
Terrace	Off-site	Yes	National	Yes	Arable land or permanent crops	> 200 m wall/ha	Not specified	56.05	8.51 – 250.00
Grass buffer strips	Off-site	Yes	National	Yes	Arable land or permanent crops	> 44 m border/ha	Not specified	56.05	8.51 – 250.00
Hedges and hedgerows	Off-site	Yes	National	Yes	Arable land or permanent crops	> 40 m hedge/ha	Not specified	56.05	8.51 – 250.00
Walls	Off-site	Yes	National	Yes	Arable land or permanent crops	> 200 m wall/ha	Not specified	56.05	8.51 – 250.00
Maintenance of traditional walls	Off-site	Yes	Regional (Canary Islands)	No	Not specified		Not specified	51.20	
Maintenance of traditional hedges	Off-site	Yes	Regional (Canary Islands)	No	Not specified		Not specified	242.80	

¹ Planned unit amount.

² Multi-year supplement included

