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Getting to the roots of sustainable land management

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CONTENTS

The CAP, soil and sustainable land management

For more than 50 years, the Common Agricultural Policy (CAP) has influenced land management in Europe. Throughout most of those years, the policy was solely focused on the objectives of increasing agricultural productivity and market stability and ensuring the availability of supplies and reasonable prices for consumers, often to the detriment of Europe's environment and natural resources.

In response successive CAP reforms have sought to integrate environmental and climate considerations into the policy since the late 1980s and early 1990s. The integration of environmental instruments and measures into the CAP has significantly altered how these objectives are expected to be fulfilled by the agriculture and forestry sectors, at least on paper.

However, in practice, efforts to mainstream environmental and more recently climate considerations into the CAP have delivered mixed results and have not been sufficient to address the scale of the sustainability challenges these sectors face.[1] The CAP reform Post-2020[2] is the latest attempt by policymakers to put environmental and climate action at the heart of the policy.

CAP support can potentially create powerful incentives and disincentives that affect land management decisions. As a result, it can play an influential role in how farmers and land managers respond to key environmental and climate challenges.

This briefing paper seeks to inform EU, national and regional policymakers about how the latest CAP reform could deliver much-needed improvements in environmental and climate action.

It starts with a short introduction to the Commission's proposals for the next CAP Post-2020. This is followed by an overview of the policy instruments most relevant to support more sustainable land management, with a specific focus on soil health (see Box 1).

The briefing then explores some of the opportunities the reform could offer to improve policy performance in reaching EU environmental and climate objectives and the UN Sustainable Development Goals (SDGs), as well as the possible risks the proposals present as they currently stand.

The briefing draws on reports that have been produced by the Institute for European Environmental Policy - IEEP - since the Commission's proposals were published in June 2018.[3] The proposals are now under review by the European Parliament and Council who are required to ratify them before any new policy can be enacted in EU law[4].

Box 1: The importance of soil for sustainable land management

Healthy soils are at the root of sustainability as they provide a wide range of functions critical for agricultural and forestry systems, such as carbon sequestration, regulating water and nutrient cycles, maintaining biodiversity, and providing food, biomass and other raw materials. Across the EU, soils continue to be exposed to a number of threats, including erosion, compaction, contamination, and the loss of soil organic matter and soil biodiversity.

For example, about 12.5% of EU arable land is affected by moderate to severe water erosion (equating to 138 200 km²). A recent study by the European Commission's Joint Research Centre (JRC) estimates that losses in crop productivity related to water erosion alone cost the EU agricultural sector around 1.25 billion euro annually[5]. Furthermore, the latest assessment from the European Environmental Agency (EEA) expects that the soil functions will continue to deteriorate if sufficient policy measures are not taken[6].

Moreover, the agriculture sector contributes about 10% of direct Greenhouse Gas Emissions (GHG) emissions in the EU. GHG emissions from agriculture are now still below the level they were in 1990, after falling until 2005. However, reductions then slowed, and since 2012 emissions from the sector in the EU have started to rise again. Alongside other strategies, sequestering carbon into agricultural soils has the potential to reduce GHG while improving soil quality[7].

The management of our soils is therefore critical for delivering long-term economic, environmental and social benefits including enhancing the contribution of the agriculture and forestry sectors to climate action. In the absence of EU policies dedicated to protecting Europe's soils, the CAP is the key tool in rural areas for supporting more sustainable management and the provision of soil's many ecosystem services[8].

Increasing the environmental and climate ambition of the CAP post-2020

Efforts to increase the environmental and climate ambition of the CAP are a key feature of the post-2020 and reflect the growing evidence that sustainable land management is fundamental to fight climate change and preserve biodiversity both of which are critical to food and biomass production and the socio-economic fabric of our rural areas.[9]

Under a 'new delivery model,' all CAP interventions would be set out in a CAP Strategic Plan (CSP) drawn up by the Member States based on a needs assessment and programming targets. The overall aim is to support a more performance-based policy aligned to common EU specific objectives (see Figure 1).

Figure 1: The nine objectives proposed for the CAP 2021-27
Source: European Commission, 2018

Overall the new performance-based approach redefines the responsibilities between the EU and Member States in the design and implementation of the CAP, shifting from compliance with detailed EU rules towards common strategic planning. Each Member State's CSP would be approved by the European Commission and progress in meeting programming targets monitored on an annual basis.

The latest reform foresees a further mainstreaming of environmental and climate concerns across the entire CAP with all interventions aligned to common EU objectives but designed and implemented according to Member States' national and regional needs and priorities set out in their CSPs.

Moreover, Member States would be legally required to:

- take account of the national environmental and climate plans emanating from the certain EU legislation and to demonstrate how the CAP's green architecture will be used to contribute to national targets;
- set out a strategy outlining how the interventions in their CSP will address their specific national/regional needs in the context of fulfilling the CAP specific objectives[10]; and
- demonstrate an increased level of environmental and climate ambition compared to the current CAP (known as the so-called 'no back-sliding' clause).

The CAP's new green architecture

The instruments and measures that Member States can use to support more sustainable land management choices amongst farmers and land managers are known collectively as the CAP's green architecture. Originally comprising voluntary agri-environmental measures supported through a combination of EU and national co-financing, new instruments and measures have been added to the CAP under successive reforms over the last number of decades. Over time, a 'green architecture' of mandatory instruments and voluntary and measures has been created across both pillars of the CAP[11]. The 'green architecture' Post-2020 foresees a reconfiguration of the CAP's current instruments and measures (see Figure 2).

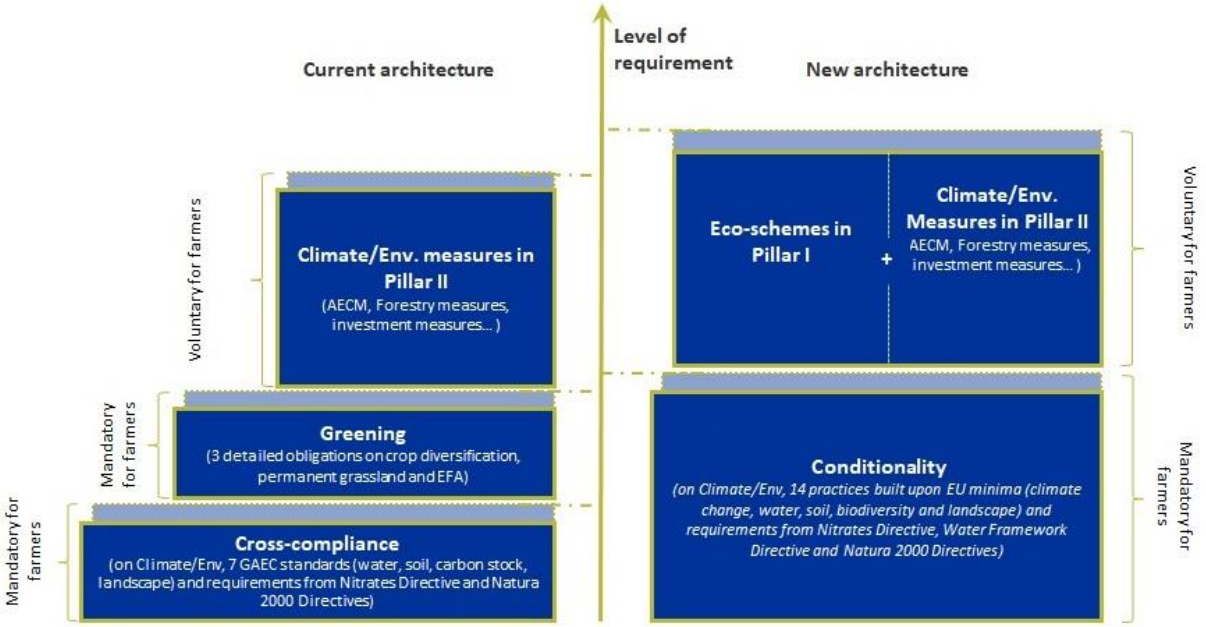

Figure 2: Comparison of the current and proposed new green architecture
Source: European Commission, 2019

A notable feature of the revised 'green architecture' is the introduction of a new agri-environment-climate instrument called the eco-scheme. It aims to incentivise more sustainable farm and land management using direct payments (Pillar 1).

As proposed, the eco-scheme would be open to farmers on a voluntary basis and would be mandatory for Member States to programme. The new instrument would be complemented by existing agri-environment-climate commitments, also available on a voluntary basis for farmers as well as land managers, using the CAP's rural development programmes (Pillar 2). Both the eco-scheme and existing agri-environment-climate commitments under Pillar 2 will be underpinned by conditionality which sets out the basic requirements and standards[12] that CAP beneficiaries must fulfil.

The suite of instruments and measures that make up the new 'green architecture' and their potential to influence land use and management in a way that could benefit soil protection and sustainable land management more broadly are explored in more detail below.

Conditionality

The baseline component of the green architecture is conditionality. Farmers receiving direct payments under Pillar 1 and 'area and animal-based payments' under Pillar 2 must comply with two types of conditionality across the entire farm holding:

- **Statutory Management Requirements** (SMR), which are derived from other EU legislation and apply to farmers and land managers, whether or not they receive CAP support[13]; and
- standards of **Good Agricultural and Environmental Condition** (GAEC) defined by Member States which beneficiaries must fulfil.

The majority of the GAEC standards can directly or indirectly impact on soil management although many aim to address other environmental and climate objectives (see Table 1).

Table 1: Extract from EU framework on CAP conditionality – soil relevant aspects

Main issue	New GAEC standards		Soil threat addressed
Climate change	**GAEC 1**	Maintenance of permanent grassland as a general safeguard against conversion to preserve carbon stock[14]*	Soil erosion, loss of organic matter/soil carbon, loss of soil biodiversity
	GAEC 2	**Preservation of carbon-rich soils such as peatlands and wetlands *(new)***	Loss of organic matter/soil carbon, loss of soil biodiversity, soil erosion
	GAEC 3	Ban on burning arable stubble to maintain soil organic matter, except for plant health reasons	Loss of soil organic matter/soil carbon
Water	**GAEC 4**	Establishment of buffer strips along water courses[15]	Contamination (diffuse), soil erosion, loss of organic matter, compaction
	GAEC 5	**Use of Farm Sustainability Tool for Nutrients *(new)*[16]**	Contamination (diffuse)
Soil	**GAEC 6**	Tillage management to reduce the risk of soil degradation, including slope consideration in order to ensure minimum land management reflecting site-specific conditions to limit erosion	Soil erosion, loss of soil organic matter/soil carbon, compaction
	GAEC 7	No bare soil in the most sensitive period(s) to protect during winter	Soil erosion, loss of soil organic matter/soil carbon, soil biodiversity
	GAEC 8	**Crop rotation to preserve soil potential *(new)***	Loss of soil organic matter/soil carbon, soil biodiversity, compaction
Biodiversity and Landscapes	**GAEC 9**	Maintenance of non-productive features and area to improve on-farm biodiversity.[17]	Loss of soil organic matter/soil carbon, soil erosion, soil biodiversity, compaction
	GAEC 10	**Ban on converting or ploughing permanent grassland in Natura 2000 sites to protect habitats and species *(new)***	Loss of organic matter/soil carbon, loss of soil biodiversity, soil erosion

Source: Own compilation based on the Commission's Proposals for a new Regulation on CAP Strategic Plans, Annex III; Frelih-Larsen et al. (2016); and expert judgement

*Notes: *GAEC supersedes existing greening obligation.*

Under the Commission's proposals, Member States must define the ten specific GAEC standards taking into account 'the specific characteristics of the areas concerned.'[18] In practice GAEC operate as overarching principles and Member States define the detail of the requirements, what is new is that the GAEC standards need to be reviewed and validated by the Commission as part of the CSP approval process. Conditionality sets the legal floor for the design of both the eco-scheme and the environment-climate commitments.

Eco-schemes and other agri-environment-climate commitments

The eco-scheme and Pillar 2 agri-environment-climate commitments are designed to build on the basic standards and requirements of conditionality to incentivise farmers and land managers to take further action. Both are intended to support the uptake of environmentally and climate-friendly practices and systems. However, the choice of instrument differs in terms of potential target beneficiaries, the contract duration, payment type, and financing (see Table 2).

Table 2: Comparison of programming requirements for eco-schemes and other agri-environmental-climate requirements

Main issue	Instrument	
	Eco-scheme: Schemes for the climate and the environment -- (Art. 28)	**AECM: Environment, climate and other management commitments - (Art. 65)**
Intervention logic	Support the uptake of environmentally and climate-friendly practices and systems based on meeting one or more of the relevant CAP specific objectives	
Beneficiaries (including eligibility criteria	Farmers fulfilling the genuine farmer, eligible hectares criteria defined by the Member States, other selection criteria could also be defined by the Member States	Farmers and land managers achieving the objectives of the scheme or operation, other selection criteria could be defined by the Member States
Contract duration	Annual or multiannual	Multiannual up 5 to 7 years or more
Payment type & calculation	Annual per hectare payment. Full or partial compensation for cost incurred/income foregone (including opportunity costs), or fixed top-up payment to the basic income support (based on Member States' justification)	Multi-annual per hectare payment, once flat-rate or as a one-off payment per unit. Full or partial compensation for cost incurred/income foregone (including opportunity costs)
Funding	EAGF (100% EU financed)	EAFRD (EU and nationally co-financed)

Source: Own complication based on the Commission's Proposals for a new Regulation on CAP Strategic Plans

Both the eco-scheme and Pillar 2 agri-environment-climate commitments would apply a high degree of subsidiarity, allowing Member States to choose and tailor them specifically to address national and regional soil threats and other land management needs. In addition, other rural development interventions can be used to complement the implementation of the CAP agri-environment-climate instruments for example investments in soil-friendly equipment; and 'soft' measures including advice, training, information and innovation[19].

Maximising opportunities for environmental and climate action and mitigating risks

The Commission's proposal for the CAP Post-2020 presents new opportunities for Member States to target and tailor CAP interventions to their specific needs and priorities in a more integrated way whilst remaining in line with the policy's specific objectives.

Strategic planning should give Member States the space to step back and to rethink the way they use CAP support to address environmental and climate issues alongside socio-economic issues facing the agricultural and forestry sectors. For instance, given the multi-functional role of soil management and the important contribution of soil-based ecosystems such an integrated approach should offer significant opportunities for complementary actions across the entire green architecture.

However, greater subsidiarity also presents a number of risks that could impede the CAP from increasing its environmental and climate ambition and reaching its full potential. Some of these opportunities and risks are explored below.

Ensuring an ambitious approach to common strategic planning

The shift towards common strategic planning across the entire CAP is essential to ensure that the policy choices made by Member States are fit for purpose. Key opportunities include:

✓ **Developing a coherent strategy:** Programming Pillar 1 and 2 interventions together under one an overarching CSP should help Member States to design and implement their interventions in a more effective and efficient way. Requiring Member States to explain how the different elements of the green architecture will work together to contribute to national targets, emanating from certain EU environmental and climate legislation, should also facilitate better integration of environment and climate priorities into CAP implementation choices;

✓ **Ensuring greater transparency:** The new common strategic planning approach potentially gives environmental authorities (at national level) and the Commission (at EU level) greater oversight over the strategic direction of the full suite of CAP interventions and measures, and how they will contribute to Member States' needs and priorities, targets and the CAP specific objectives respectively. The 'no back-sliding' clause sends a clear signal of the need for Member States to step up their efforts to address the key environmental and climate issues facing the agriculture and forestry sectors. Annual reviews between the Commission and Member States should also ensure that progress is being made on reaching the programming targets set out in the CSPs.

Nevertheless, legal ambiguity could undermine and impede a real shift to a more performance-based CAP. In particular:

x **A broad-brush approach**: the 'specific' environmental and climate objectives are not sufficiently detailed nor are they explicitly linked to EU environmental and climate targets or aligned to the SDGs to require a proactive or quantified contribution. There is also no clear procedure for how Member States would turn the CAP environmental and climate objectives into more targeted operational objectives adapted to their needs, circumstances and priorities. Therefore, the unspecific nature of the policy's objectives increases the risk that Member States will not engage in strategic planning and

instead set vague national objectives and targets which in turn could lead to the design of poorly focused interventions; and

X **Failing to be ambitious:** To ensure increased environmental/climate ambition is achieved, clear procedures are needed to determine if a Member State's CSP is capable of delivering the desired impact. The inclusion of a 'no back-sliding' clause and requiring that national targets set out in EU environmental and climate legislation are taken into account are a step in the right direction. However, unlike for climate, biodiversity and water there is no legal framework for soil beyond the principles set out EU's Soil Thematic Strategy or where other EU environmental legislation may have an indirect impact on soil management, e.g. the Water Framework Directive or Sustainable Pesticide Use Directive. As the procedures of the 'no back-sliding clause' are not sufficiently defined, clear criteria will need to be put in place so that the Commission can make a sound judgement as to whether Member States are increasing their ambition compared to the current period. Detailed data on each intervention is also necessary to fully understand why the choice was taken and to support the monitoring of the implementation including the expected impacts of the respective intervention.

Robust environmental and climate standards

Under **conditionality** basic standards provide the starting point for addressing a number of soil threats across the majority of the EU farmed landscape including:

✓ **Improvements in basic environmental and climate standards:** Standards ensure that all farms in receipt of area or animal-based payments are required to meet basic conditions related to soil and environmental and climate action more broadly. Of the three standards directly targeted at soil management (GAEC 6, 7, 8), the replacement of crop diversification (under the current greening requirements) with a new crop rotation (GAEC 8) has huge potential to improve action on soil fertility, soil structure, soil biodiversity and nutrient management.

✓ **An increase in basic environmental and climate action:** The new GAEC should help increase awareness of the need for action on soil health and carbon management. For instance, the inclusion of a standard to preserve carbon-rich soils on peatlands and wetlands (GAEC 2) should have a significant impact on soil carbon stocks, while introduction of a new Farm Sustainability Tool for Nutrients (GAEC 5) should help to support farmers' understanding of nutrient balances and assist management decisions relevant to their farming enterprise.

Although the Commission would be given new powers to review and validate the GAEC proposed by Member States, there are not sufficient safeguards in place for the Commission to ensure that basic standards are fit for purpose. These include ensuring:

X **Robust environmental and climate standards:** Minimum requirements are not only necessary to build awareness of basic environmental and climate action across the entire farmed landscape, but also to ensure an ambitious baseline for land management commitments. In the case of soil management, a number of the GAEC standards should be further specified while maintaining sufficient flexibility for Member States to tailor the standards. For instance, the 'sensitive periods' where there should be no bare soil (GAEC 7), criteria for voluntary crop rotation that promotes specific soil enhancing crops (GAEC 8), and peatland and wetland areas that must be protected as a minimum (GAEC 2) should be clearly defined to ensure a more robust EU level baseline; and

X **Integrated approach to basic environmental and climate action:** While GAEC are designed to address specific issues, an integrated approach to ensure standards deliver co-benefits is needed. For instance, farm-level nutrient management planning can be a key tool for supporting short-term productivity, environmental impact and long-term sustainability. However, for nutrient management to be effective, soil management strategies must be at the heart of the tool. Clarity is also needed on how anonymised farm data from these tools will be aggregated in a fair, secure and transparent way to support more effective farmer decision-making and policy monitoring and evaluation.

Mainstreaming more sustainable land management using incentives

Both the **eco-schemes and other agri-environment-climate commitments** present two possible pathways for Member States to facilitate the uptake of more sustainable land management. In particular:

✓ **A stronger toolbox:** the design of the eco-schemes and other Pillar 2 agri-environment-climate commitments as part of an overall framework could provide Member States with better means to address soil management and other land management issues in a more holistic and modular way. For, instance both interventions could work synergistically to build on the basic standards for soil under conditionality by supporting a combination of entry-level and/or more demanding and focussed commitments; and

✓ **A new way to target direct payments:** Unlike the current greening, the eco-scheme gives Member States greater flexibility to programme schemes and operations according to their needs and circumstances. As direct payments cover the majority of the EU's utilised agricultural area (UAA), the new eco-scheme the new instrument can support a shift towards more sustainable land management on a significant proportion of the UAA.

Based on full territorial coverage such an approach could promote a widespread shift towards more sustainable farming systems across the farmed countryside of the EU. It would also allow spending for agri-environment-climate commitments under Pillar 2 to be freed up for more advanced schemes and commitments directed at specific environmental hotspots; and

Despite the introduction of a new agri-environment-climate instrument, there is a risk that interventions could end-up working in silos and not adequately address long-term environmental and climate issues in a complementary way. This includes:

X **A greater emphasis on addressing the scale of the challenge:** While Pillar 2 agri-environment-climate commitments have had a long and rich history of design and implementation over the last number of decades, it is important to remember that despite their contribution, they have not been sufficient to address the scale of the environmental and climate challenges facing the agriculture and forestry sectors. Yet beyond the legal requirement for the two interventions to work coherently, there is no requirement for these instruments to be used collectively to address key environmental and climate challenges; and

X **Ensuring sustained investment**: While a minimum spending of 30% of the EAFRD is foreseen for agri-environment-climate commitments, as currently proposed the lack of ring-fenced CAP funding allocated to the eco-scheme is a major limiting factor. It fails to send a clear signal of the political imperative for the next CAP to increase its ambition for addressing both EU and environmental and climate issues.

Longer-term contracts may also provide greater certainty for farmers and land managers in terms of the payments they will receive over a clearly defined number of years for meeting commitments. As a result, there should also be greater legal provision taking account of the fact that commitments addressing soil and wider land management may take multiple years to achieve the desired result.

Concluding remarks

The Commission's proposals for the post-2020 present new opportunities to put environmental and climate action at the heart of the next CAP. As the policy has the potential to create powerful incentives and disincentives that affect land management decisions, it can, therefore, play an influential role in how farmers and land managers respond to key environmental and climate challenges including soil health.

This briefing paper provides a short introduction to the proposals and an overview of the policy instruments most relevant to support more sustainable land management. It shows that Post-2020 reform could deliver much-needed climate and environmental improvement.

However, to reach its full potential the Commission's proposals needs to be further enhanced by the European Parliament and Council during the co-decision process. This includes ensuring:

- An ambitious approach to common strategic planning is taken where CAP interventions are designed to make an active contribution to EU environmental and climate objectives based on Member States needs and priorities. This should include the involvement of relevant environmental stakeholders in addition to input from environmental authorities as well as strong oversight on the part of the Commission and the EU Institutions more broadly to support the CAP evolution towards a more genuinely performance-based policy;

- the suite of instruments designed to tackle key environmental and climate issues are capable of addressing the challenges facing the agriculture and forestry sectors. This includes a more clearly defined baseline of environmental standards complemented by an eco-scheme and Pillar 2 agri-environmental commitments that give farmers that right incentives to make an active contribution to the Member States' environmental and climate needs based on the principle of continuous development; and

- there is a sufficient budget ring-fenced for environmental and climate across both pillars of the CAP to ensure that policy is better equipped to address the scale of the environmental and climate challenges. At a minimum Member States should maintain their levels of expenditure under both pillars which is targeted at these issues with the aim of increasing expenditure progressively over the lifetime of the policy.

Finally, healthy soils and sustainable land management can only be achieved by ensuring the right level of ambition and policy coherence. This requires full alignment of the CAP with the SDGs, including an increase in expenditure on sustainable development priorities and at the same time the phasing out of spending that is not in line with these priorities.

However, to achieve these transformative changes, a common direction of travel for the agriculture and forestry sectors at EU level that can guide the development of the CSPs is vital. Indeed, the new Commission's forthcoming Green Deal, strategies for sustainable food, biodiversity protection, and a "zero-pollution" commitment can provide this direction, but only if the EU has clearly defined 2030 targets as to where these sectors must make an active and measurable contribution.

References

[1] See Buckwell A. et al. 2017. CAP: Thinking Out of the Box Further modernisation of the CAP – why, what and how. Brussels: RISE Foundation. Available at: http://www.risefoundation.eu/images/files/2017/2017_RISE_CAP_Full_Report.pdf; Pe'er, G. et al. 2017. Is the CAP Fit for purpose? An evidence-based fitness-check assessment. Leipzig: BirdLife, European Environmental Bureau, NABU, iDiv, UFZ, University of Göttingen. Available at: https://www.ufz.de/export/data/2/148460_Peer%20et%20al%20CAP%20Fitness%20Check_PreliminaryResults_ExecutiveSummary%209.7.2017.pdf.

[2] Communication A Modern Budget for a Union that Protects, Empowers and Defends The Multiannual Financial Framework for 2021-2027, Brussels, COM(2018)321 final. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52018DC0321&from=EN

[3] Hart, K., and Bas-Defossez, F. (2018) CAP 2021-27: Proposals for increasing its environmental and climate ambition, report for NABU by IEEP. Available at: https://ieep.eu/publications/cap-2021-27-proposals-for-increasing-its-environmental-and-climate-ambition; Meredith, S., and Hart, K. 2019. CAP 2021-27: Using the eco-scheme to maximise environmental and climate benefits, report for IFOAM EU by IEEP. Available at: https://ieep.eu/publications/cap-2021-27-using-the-eco-scheme-to-maximise-environmental-and-climate-benefits; and Bas-Defossez, F and Meredith (2019) CAP 2021-27: Comparative analysis of environmental performance of COMENVI and COMAGRI reports, report for NABU by IEEP. Available at: https://ieep.eu/publications/cap-2021-27-comparative-analysis-of-environmental-performance-of-comenvi-and-comagri-reports

[4] The co-decision or ordinary legislative procedure of the European Union is the legal process in which the majority of the Community's decisions are made. It is based on the principle of parity which means that neither EU co-legislators (European Parliament or Council) may adopt legislation without the other's assent. The legislative process with legislative proposals from the Commission and consists of up to three readings, with the possibility for the co-legislators to agree on a joint text.

[5] See Eurostat (2018) Agri-environmental indicator - soil erosion based on 2012 data. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Agri-environmental_indicator_-_soil_erosion&oldid=254669

[6] European Environment Agency (EEA). 2015. SOER 2015 — The European environment — state and outlook 2015 Available at: https://www.eea.europa.eu/soer

[7] Lóránt, A., and Allen, B. (2019) Net-zero agriculture in 2050: how to get there? Report by the Institute for European Environmental Policy. Available at: https://ieep.eu/publications/net-zero-agriculture-in-2050-how-to-get-there

[8] Frelih-Larsen, A. et al. (2016). 'Updated Inventory and Assessment of Soil Protection Policy Instruments in EU Member States.' Final Report to DG Environment. Berlin: Ecologic Institute. Available at: https://ec.europa.eu/environment/soil/pdf/Soil_inventory_report.pdf

[9] IPBES. 2019. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Available at:http://pbes.net/system/tdf/inline/files/ipbes_global_assessment_report_summary_for_policymakers.pdf?file=1&type=node&id=36213; IPCC,. (2019). Climate Change and Land: IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. Summary for policymakers. IPCC, Intergovernmental Panel on Climate Change. Available at: https://www.ipcc.ch/site/assets/uploads/2019/08/Edited-SPM_Approved_Microsite_FINAL.pdf

[10] Currently this is only a legal requirement for measures implemented under the rural development programmes with Pillar 1 implementation choices notified to the Commission in order to ensure compliance with EU rules.

[11] The CAP has two funds financing Pillar 1 –the European Agricultural Guarantee Fund (EAGF) 100% financed by the EU budget and Pillar 2 -the European Agricultural Fund for Rural Development (EAFRD) –co-financed by the EU and Member States

[12] Formerly known as 'cross compliance' these requirements and standards relate to environment and climate action set under EU law and policies as well as other issues concerning human, animal and plant health etc.

[13] None of the SMRs relate directly to soils, although how they are designed and implemented may indirect effects for soil quality e.g. the Water Framework Directive

[14] The European Commission would be empowered to define the ratio of permanent grassland, the year of reference and the rate of conversion through an accompanying delegated act

[15] Although the primary purpose of GAEC 4 is to protection against pollution, buffer strips also help to alleviate soil erosion

[16] The FST should include information on soil sampling and relevant management practices and nutrient budgeting at farm level based on based on the CAP's Integrated Administration and Control System (IACS). The tool should allow for two-way communication between farmers and Member State PA/MA and have modularity to allow for new sustainability objectives (e.g. emissions and water management). The European Commission would be empowered to define the format and additional minimum elements and functionalities of the FST.

[17] This includes a minimum share of agricultural area devoted to non-productive features or areas, the retention of landscape features, a ban on cutting hedges and trees during the bird breeding and rearing season and optional measures for avoiding invasive plant species

[18] Including soil and climactic conditions, existing farming systems, land use, crop rotation, farming practices and farm structures.

[19] These interventions are currently supported under the EU rural development programmes (RDPs). Further information of the RDP measures most relevant to supporting soil protection in agriculture see Bowyer, C., and Keenleyside, C., 2017. Joining the Dots — Soil health, Agriculture and Climate: A Briefing on agricultural policy in the EU, its role in soil protection - linking soil to land use related climate goals. Interactive Soil Quality assessment in Europe and China for Agricultural productivity and Environmental Resilience (iSQAPER) project. Available at: https://ieep.eu/publications/isqaper-joining-the-dots-soil-health-agriculture-and-climate

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