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A Renewed EU Soil Strategy for Climate-Smart Agriculture



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1. *Introduction*

Against the social changes impacting on today's knowledge-informed agricultural practices, soil governance is gaining momentum to support interactions between farmers and the land that promote soil health management while monitoring and facing the negative effects of agricultural land use¹.

In 2006, the European Union's (EU) Soil Thematic Strategy defined soil as «the top layer of the earth's crust, formed by mineral particles, organic matter, water, air, and living organisms»². It constitutes a living body in constant flux that is capable of ensuring key environmental, social, and economic functions³. They span from the protection of biodiversity and the atmosphere to the storage of water, to the preservation of the landscape and cultural heritage⁴.

Agriculture depends exclusively on soil⁵, which can fulfil most of its services⁶ if its moisture regime and aeration are not disrupted, plants have room

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¹ M. VIDAR, *Soil and agriculture governance and food security*, in *Soil Security*, 6, 2022, p. 100027.

² Commission of the European Communities, *Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - Thematic Strategy for Soil Protection*, COM(2006) 231 final, Brussels, p. 2.

³ U.N. NIELSEN-D.H. WALL-J. SIX, *Soil biodiversity and the environment*, in *Annu. Rev. Environ. Resour.*, 40, 2015, p. 63.

⁴ W.E.H. BLUM, *Functions of soil for society and the environment*, in *Rev. Environ. Sci. Biotechnol.*, 4, 2005, p. 75.

⁵ See S. SMITH-C.M. GALLAHER, *Soil and agriculture*, in D.M. KAPLAN (ed), *Encyclopedia of food and agricultural ethics*, Dordrecht, 2019, https://doi.org/10.1007/978-94-024-1179-9_539.

⁶ Scholarship distinguishes five agricultural soil functions: biomass production; water purification; carbon sequestration; biodiversity habitat; and recycling of nutrients and agro-

for their roots, nutrients and soil biota are in balance, and pollution levels are within tolerable limits for plants and soil organisms⁷. Simultaneously, soil use patterns (e.g., mechanical tillage, productive uses, or agronomic practices) and changes in soil utilization (e.g., conversion of pastures or wooded areas to arable land) can affect the ability of agricultural soils to absorb and store carbon⁸.

These aspects explain why soil-based functions are at the crossroads of the global challenges posed by climate change⁹, environmental degradation¹⁰, food security¹¹, and biodiversity loss¹². Soil is constantly threatened by hazards such as erosion, progressive loss of organic matter, compaction, salinization and sealing, landslides, and contamination¹³. Over the years, intensive farming practices, monoculture, and deep ploughing have endangered soil health and quality, causing depletion of nutrients, pollution, alteration of the soil structure, erosion, and decreased biodiversity¹⁴. Parallely, deforestation and the expansion of agricultural land have endangered the ability of forest soils to act as a “carbon sink”¹⁵.

chemicals. See R.P.O. SCHULTE ET AL., *Functional land management: A framework for managing soil-based ecosystem services for the sustainable intensification of agriculture*, in *Environ. Sci. Policy*, 38, 2014, p. 45.

⁷ J.F. PONGE, *The soil as an ecosystem*, in *Biol. Fertil Soils*, 51, 2015, pp. 645-648.

⁸ T.A. ONTL-L.A. SCHULTE, *Soil carbon storage*, in *Nature Education Knowledge*, 3(10), 2012, p. 35.

⁹ H. PÖRTNER ET AL. (eds), *Climate change 2022: Impacts, adaptation, and vulnerability*, Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC, 2022.

¹⁰ P. EKINS-J. GUPTA-P. BOILEAU, *Global environment outlook – GEO-6: Healthy planet, healthy people*, UN Environment, 2019.

¹¹ FAO-IFAD-UNICEF-WFP-WHO, *The state of food security and nutrition in the world 2022. Repurposing food and agricultural policies to make healthy diets more affordable*, FAO/IFAD/UNICEF/ WFP/WHO, 2022.

¹² E.S. BRONDIZIO-J. SETTELE-S. DÍAZ-H.T. NGO (eds), *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, IPBES, 2019.

¹³ See C. GARDI-S. JEFFERY-A. SALTELLI, *An estimate of potential threats levels to soil biodiversity in EU*, in *Glob. Change Biol.*, 19, 2012, doi: 10.1111/gcb.12159; J. STOLTE ET AL. (eds), *Soil threats in Europe: Status, methods, drivers and effects on ecosystem services*, JRC Technical Reports, European Union, 2015; M. TIBBETT-T.D. FRASER-S. DUDDIGAN, *Identifying potential threats to soil biodiversity*, in *Peerj.*, 8, 2020, e9271.

¹⁴ FAO-ITPS-GSBI-SCBD-EC, *State of knowledge of soil biodiversity - Status, challenges and potentialities*, FAO, 2020.

¹⁵ P. BORRELLI, *Soil erosion modelling: A global review and statistical analysis*, in *Sci. Total Environ.*, 780, 2021, p. 146-494.

Against this backdrop, the implementation of policies that focus on the protection of soil has become a slogan of civic campaigns¹⁶ supported by NGOs, research institutes, farmer associations, and environmental groups. They call for specific legislation on soil security that assumes sustainable soil management as a primary commitment¹⁷ and for conservation techniques that provide benefits in terms of energy and water savings¹⁸ and support of soil microorganisms¹⁹.

However, despite the urgency to protect the soil because it is a finite environmental resource²⁰, a comprehensive EU approach remains far from taking its proper normative shape²¹. The policy framework appears strongly fragmented, with the topic at issue featuring a vast array of EU secondary laws (on water, waste, chemicals, industrial pollution prevention, nature protection, pesticides)²² and the agenda of the Common Agricultural Policy (CAP). Arguments against Europe-wide harmonised soil monitoring affirm that duplication of legislation will reduce effectiveness instead of increasing it²³.

¹⁶ In 2015, for instance, the Alliance of European Voluntary Services organizations decided to officially support the campaign People4Soil, a European Citizens' Initiative calling on the European Commission to elaborate legislation regarding soil protection. See <<http://www.alliance-network.eu/former-alliance-campaigns/environmental-sustainability-campaign/people4soil/>> accessed 12 February 2023.

¹⁷ For an outlook about the concept of soil security as a theoretical base to be used for a soil policy framework, see A. MCBRATNEY-D.J. FIELD-A. KOCH, *The dimensions of soil security*, in *Geoderma*, 213, 2014, pp. 203-213; A. KOCH ET AL., *Soil security: solving the global soil crisis*, in *Global Policy*, 4(4), 2013, pp. 434-441.

¹⁸ And, consequently, in terms of economic savings.

¹⁹ Some of these include bacteria, algae, fungi, worms, springtails, and woodlice, etc.

²⁰ As it is not reproducible and regenerable.

²¹ For an analysis on whether and how soil threats are addressed in EU legislative policies, see N. GLÆSNER-K. HELMING-W. DE VRIES, *Do current European policies prevent soil threats and support soil functions?*, in *Sustainability*, 6, 2014, pp. 9538-9563.

²² For an overview on the indirect protection of soil in law, see R.A. KRAEMER ET AL., *EU soil protection policy: Current status and the way forward*, Background Paper to the Dutch Ministry of Housing, Spatial Planning and the Environment (VROM), Ecologic-Institute for International and European Environmental Policy, 2004.

²³ See, for instance, COPA-COGECA, *Reflection paper on the EU Soil Strategy for 2030*, 2022, <<https://copa-cogeca.eu/Publications>> accessed 27 March 2023; INTERNATIONAL ASSOCIATION OF OIL & GAS PRODUCERS, *IOGP input to European Commission call for evidence on "soil health – protecting, sustainably managing and restoring EU soils"*, Position statement, 2022, <<https://iogpeurope.org/wp-content/uploads/2022/04/EU-Soil-Health-Law-response-paper.pdf>> accessed 18 March 2023.

This lack of a general EU approach to the matter is specular to the international panorama²⁴, where legal agreements – the Convention on Biological Diversity²⁵, Kyoto Protocol²⁶, Alpine Convention²⁷, and UN Convention to Combat Desertification²⁸ – address the prevention of phenomena affecting the soil, albeit without referring to human activities that can be dangerous in combination with natural phenomena.

As for soil conservation legislation, two basic patterns are discernible, although they remain blurred with regard to their degree of specificity²⁹. The first consists of displaying a conservation law that applies to all natural resources; the second conveys laws regulating various resource uses as the need arises. These initiatives run together with standards and guidelines on soil conservation that are significant for the development and implementation of national resource policies³⁰.

²⁴ O.C. RUPPEL, *Overview of international soil law*, in *Soil Security*, 6, 2022, p. 100056.

²⁵ United Nations, *Convention on Biological Diversity*, 1992, <<https://www.cbd.int/doc/legal/cbd-en.pdf>> accessed 12 February 2023.

²⁶ United Nations Framework Convention on Climate Change (UNFCCC), *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 1997, <<https://unfccc.int/documents/2409>> accessed 12 February 2023.

²⁷ *Alpine Convention - Framework Convention*, 1991, <https://www.alpconv.org/fileadmin/user_upload/Convention/EN/Framework_Convention_EN.pdf> accessed 12 November 2022.

²⁸ United Nations, *Convention to Combat Desertification*, 1994, <<https://www.unccd.int/convention/overview>> accessed 12 February 2023.

²⁹ FAO, *Legislative principles of soil conservation*, FAO Soils Bulletin 15, 1971, <<https://www.fao.org/3/c3439e/c3439e.pdf>> accessed 12 February 2023.

³⁰ The World Soil Charter, enacted by FAO in 1981 and revised in 2015, lists a set of key principles and general guidelines to chart policy measures and action programmes that guarantee sustainable management of soils against the major threats emerged during the last decades. The Charter points out that «good soil governance requires that actions at all levels – from States, and, to the extent that they are able, other public authorities, international organizations, individuals, groups, and corporations – be informed by the principles of sustainable soil management and contribute to the achievement of a land-degradation neutral world in the context of sustainable development» (FAO, *Revised World Soil Charter*, 2015, <<https://www.fao.org/3/I4965E/i4965e.pdf>> accessed 20 January 2023, p. 5). To this end, a toolkit of Voluntary Guidelines for Sustainable Soil Management provides generally accepted, practically proven, and science-based principles and policy recommendations for a wide range of committed stakeholders. On a parallel track, a protocol to the CBD or the UNCCD, or an international legal instrument on soil protection, is suggested by scholarship as a fruitful step on the international stage for a comprehensive soil governance (I. HEUSER, *Soil governance in current European Union law and in the European Green Deal*, in *Soil Security*, 6, 2022, p. 100053).

Yet, these soft and hard rules have not succeeded in ensuring adequate protection for soil functions³¹, despite numerous scientific studies³² and institutional reports³³ outlining the prominent role played by soil fertility in agriculture³⁴ and the need to promote soil management for a more resilient agri-food system³⁵.

In 2018, the EU Court of Auditors suggested enhancing the existing legal framework through guidance to Member States on practical aspects of preserving soil³⁶, in light of the UN's Sustainable Development Goal (SDG) 15, which includes a target of restoring degraded land and soil³⁷. One year later, the International Panel of Experts on Sustainable Food Systems (IPES-Food) advocated the adoption of an EU Soil Framework Directive to reconcile sustainable land development with healthy soils and integrate new soil management requirements into CAP conditionalities³⁸. This request arose from

³¹ *Ibidem*.

³² See P.C. BAVEYE-J. BAVEYE-J. GOWDY, *Soil "ecosystem" services and natural capital: Critical appraisal of research on uncertain ground*, in *Front. Environ. Sci.*, 4(41), 2016, doi: 10.3389/fenvs.2016.00041; J. LEHMANN ET AL., *The concept and future prospects of soil health*, in *Nat. Rev. Earth. Environ.*, 1, 2020, pp. 544-553; A. ORGIAZZI ET AL., *A knowledge-based approach to estimating the magnitude and spatial patterns of potential threats to soil biodiversity*, in *Sci. Total Environ.*, 2016, p. 545; C. WAGG ET AL., *Soil biodiversity and soil community composition determine ecosystem multifunctionality*, in *P. Natl. Acad. Sci. USA*, 111, 2014, pp. 5266-5270; M. WIESMIEIER ET AL., *Soil organic carbon storage as a key function of soils - A review of drivers and indicators at various scales*, in *Geoderma*, 333, 2019, pp. 149-162.

³³ See EUROPEAN COMMISSION, *Caring for soil is caring for life: ensure 75% of soils are healthy by 2030 for food, people, nature and climate: Report of the Mission Board for soil health and food*, Directorate General for Research and Innovation, European Union, 2020; FAO-UNEP, *Global assessment of soil pollution*, FAO/UNEP, 2021; A. JONES ET AL., *The state of soil in Europe*, A contribution of the JRC to the European Environment Agency's Environment State and Outlook Report – SOER 2010, European Union, 2012; L. MONTANARELLA-R. SCHOLES-A. BRAINICH (eds), *The IPBES assessment report on land degradation and restoration*, Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, IPBES, 2018.

³⁴ See FAO, *Soils for nutrition: State of the art*, FAO, 2022; W.L. SILVER-T. PEREZ-A. MAYER-A.R. JONES, *The role of soil in the contribution of food and feed*, in *Phil. Trans. R. Soc. B*, 376, 20200181, 2021, <https://doi.org/10.1098/rstb.2020.0181>.

³⁵ A. BUCKWELL-E. NADEU-A. WILLIAMS, *Sustainable agricultural soil management: What's stopping it? How can it be enabled?*, RISE Foundation, 2022.

³⁶ EUROPEAN COURT OF AUDITORS, *Combating desertification in the EU: A growing threat in need of more action*, Special Report No 33, Luxembourg, 2018, paras. 43-45 and 76.

³⁷ UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP), *GOAL 15: Life on land*, 2015, <<https://www.unep.org/explore-topics/sustainable-development-goals/why-do-sustainable-development-goals-matter/goal-15>> accessed 15 February 2023.

³⁸ O. DE SCHUTTER, *Towards a common food policy for the European Union – The policy reform and realignment that is required to build sustainable food systems in Europe*, IPES-FOOD panel,

the urgency of reconnecting land development with soil management, as healthy soil is contingent on sustainable land use.

The Soil Strategy for 2030³⁹ represents an attempt to address these issues. It aims to reform the legal pathway for soil protection by combining voluntary and legislative action to grant soil the same level of protection as water, marine environment, and air. With global warming and soil deterioration requiring a strengthened systemic approach to the matter, the EU Strategy is expected to address a variety of soil-related environmental objectives, from the mitigation of climate change to the preservation of biodiversity, to the provision of food and water.

This contribution provides an outline of these recent developments with reference to the agricultural field and offers a prospect for the impact of more recent initiatives, pending the legislative procedure for a holistic EU Soil Law. The final purpose is to discuss the perspective of agricultural soil that surrounds the future EU Directive on Soil Monitoring and Resilience. The remainder of this paper is organised as follows.

Section 2 begins with the EU provisions addressing the state of agricultural soil to contextualise the 2002 Strategy on Soil Protection and discusses the Commission's 2006 Proposal for a Soil Framework Directive. The analysis sets the stage for an in-depth examination of the policy that Europe has implemented against soil degradation and in support of agricultural soil health. From this perspective, one core question arises: will more sustainable use and proper preservation of the multifunctionality of soil be properly addressed and fostered, as expected by the EU Green Deal agenda⁴⁰?

To unravel this dilemma, Section 3 explores the Commission's legislative proposal on carbon farming, which is meant as a practice that can improve soil health in agricultural lands. The analysis will help explore whether and how this piece of legislation may reinforce Europe's efforts to deal with climate-related impacts on agricultural soil. Taking stock of this panorama

2019, <https://ipes-food.org/_img/upload/files/CFP_FullReport.pdf> accessed 15 February 2023, p. 43.

³⁹ EUROPEAN COMMISSION, *Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - EU Soil Strategy for 2030. Reaping the benefits of healthy soils for people, food, nature and climate*, COM/2021/699 final, Brussels.

⁴⁰ EUROPEAN ENVIRONMENTAL AGENCY (EEA), *The European environment — State and outlook 2020. Knowledge for transition to a sustainable Europe*, European Union, 2019, p. 131.

legally *in fieri*, the article sheds some light on how CAP 2023-2027 might contribute to achieving the desired goals in matters of agricultural soil (Section 4). Some clues to the EU legal picture are presented (Section 5). The final considerations conclude the analysis (Section 6).

2. Which strategy for soil protection in EU agriculture?

At the regulatory level, the soil consumption problem reflects two main perspectives that correlate to soil exploitation and its ability to fulfil productive and conservative purposes simultaneously⁴¹. The first aim is environmental protection and land management, thus fitting into the urbanization process that regulates the relationship between urban and rural areas⁴². The second aim is to safeguard rural areas, promote local development, and protect the natural vocation of agricultural land within the framework of food security⁴³.

However, when it comes to the protection of soil in EU agriculture, the extensive body of legislation makes little explicit reference to this issue. Within the primary source of EU law, the only mention of soil is in Article 38 TFEU. This merely specifies that the soil products constitute agricultural products. Indirect references to soil conservation include broader protection of the environment and the principle of sustainable development⁴⁴. They are referred to in the preamble to the Charter and Article 37, the preamble to the TEU and its Article 2, Article 191 TFEU, and the legitimacy parameter *ex* Article 6 TFUE.

As for EU secondary legislation, mentions of agricultural soil are small islands in an archipelago of hard rules pertaining to EU environmental policy (which falls under the shared competence between the Union and Member

⁴¹ N. LUCIFERO, *Il "contenimento del consumo del suolo agricolo": un problema di qualificazione e regolamentazione giuridica*, in *Dir. agroalim.*, 1, 2017, pp. 27-57.

⁴² W. GASPARRI, *Urban sprawl and sustainable development in the agricultural destination of soils*, in *Diritto pubblico*, 26(2), 2022, pp. 421-466.

⁴³ On this matter, see S. MASINI, *Sulla qualità (alimentare) come regola conformativa della destinazione d'uso del suolo*, in *Aestimum*, 59, 2011, pp. 105-122; L. RUSSO, *Il consumo di suolo agricolo all'attenzione del legislatore*, in *Aestimum*, 63, 2013, pp. 163-174; G. STRAMBI, *Limiting agricultural land consumption to guarantee food security and sustainable development*, in *EU Agrarian Law*, 1, 2012, pp. 3-10.

⁴⁴ M. BORRACCETTI, *L'Unione europea e la protezione del suolo: realtà o work (not) in progress?*, in L. COSTATO-P. BORGHI-L. RUSSO-S. MANSERVISI (eds), *Dalla riforma del 2003 alla PAC dopo Lisbona. I riflessi sul diritto agrario, alimentare e ambientale, Atti del Convegno di Ferrara 6-7 maggio 2011*, Napoli, 2011, p. 221.

States)⁴⁵. They span from Directive 2004/35/CE on environmental liability⁴⁶ to Regulation (EU) 2019/1009 on fertilising products⁴⁷, Directive 2010/75/EU on industrial emission⁴⁸, and Sewage Sludge Directive 86/278 on environmental protection⁴⁹.

Soil protection is also mentioned in Directive 91/676/EEC, which concerns the protection of waters against pollution caused by nitrates from

⁴⁵ See Article 4(2) TFEU.

⁴⁶ Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage [2002] OJ L 143/56. It sets out a common framework for ensuring the remedying of environmental damage. It aims at removing, controlling, or containing the relevant contaminants «so that the contaminated land [...] no longer poses any significant risk of adversely affecting human health» (Annex I, para. 2, Dir 2004/35). Risk-assessment procedures are devoted to assessing the presence of such risks, by taking into account the characteristic and function of the soil. Hence, remedial activities to protect soil end up depending on the possible threats to another fundamental value, which is human health (K.H. FEHR-B. FRIEDRICH-S. SCHEIL, *Liability directive - A useful tool for nature protection?*, in *JEEPL*, 2, 2007, p. 19).

⁴⁷ Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003 [2019] OJ L 170/1. Here, a bland protection of soil can be inferred by Annex I, which sets the limit values for contaminants in both organic and inorganic soil improvers. Soil improver is defined as «an EU fertilising product the function of which is to maintain, improve or protect the physical or chemical properties, the structure or the biological activity of the soil to which it is added» (Annex I, Part II, Reg 2019/1009).

⁴⁸ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) [2010] OJ L 334/17. It requires intensive livestock farms (exceeding well-defined sizes) to prevent emissions of pollutants to air, water and land, avoid waste production and dispose of waste in a safe way, and return disused industrial sites to a satisfactory state.

⁴⁹ Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture [1986] OJ L 181/6. It represents probably the legislative act most focused on soil protection. Indeed, while not providing a definition of soil, the act's preamble emphasizes the scope «to regulate the use of sewage sludge in agriculture in such a way as to prevent harmful effects on soil» (this Recital is taken up in Article 1), whilst «establishing certain initial Community measures in connection with soil protection». A set of conditions is prescribed for sludge usage to monitor the quality of soil and ensure greater protection for it. Yet, the Directive still permits – as the European Economic and Social Committee outlined – high concentrations of heavy metals and other pollutants in sewage sludge that can be spread on farmland (*Opinion of the Economic and Social Committee on “The revision of Council Directive 86/278/EEC on the use of sewage sludge in agriculture”* [2001] OJ C 14/141). A revised legal framework has thus been requested to limit the introduction of dangerous substances into the soil, and to clarify liability and damages issues (see *Opinion of the European Economic and Social Committee on the Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC*, COM(2006) 232 final — 2006/0086 COD [2007] OJ C 168/29, para. 4.1.3).

agricultural sources⁵⁰, and in Regulation on organic farming⁵¹, which depicts organics as a «sustainable management system» that is based on adaptation to diverse local soil and climate conditions, and on nourishing the plants primarily through the soil ecosystem⁵².

Although the list of legislation may continue, for instance in the field of chemical policy⁵³, two main considerations can be made. First, several threats to the soil may come directly from agricultural practices, which can pose demanding challenges to soil protection, pollution, water contamination, and

⁵⁰ Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources [1991] OJ L 375/1. To tackle water pollution, the rules prescribe the adoption, at national level, of specific measures relating, inter alia, to limitation of the land application of fertilizers, consistent with good agricultural practice, and considering the characteristics of the vulnerable zone concerned (in particular soil conditions, soil type, and slope) (See Annex III, Dir 91/676). It is, therefore, an indirect form of soil protection that has a peculiar preventive value. One of its two objectives aspires in fact to prevent – as Article 1 states – pollution caused or induced by nitrates from agricultural sources.

⁵¹ Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007 [2007] OJ L 150/1. For a deep overview of the main facets of the legal framework put forward by this legislation, see L. LEONE, *Organic Regulation – A legal and policy journey between Europe and the United States*, Tricase (LE), 2019, who elucidates how the normative representation that Europe has built on organic farming is the result of value choices (both scientific and political), which have been affected by the public debate emerged within the institutional context of reference.

⁵² See Art 5 and Recitals 39 and 30, Reg 2018/848. Against this backdrop, not only is the long-term fertility of soil listed in the objectives of the Regulation, but also the sustainment and responsible use of the soil are included in the general principles underpinning the discipline (see Arts 4 and 5, Reg 2018/848). As regards agricultural activities and aquaculture, at their core are the maintenance and enhancement of soil life and natural soil fertility, soil stability, soil water retention and soil biodiversity, together with the prevention of soil erosion and of loss of soil organic matter (Art 6, Reg 2018/848). To this end, preventive measures are requested at every stage of production, preparation and distribution, where appropriate, to ensure the preservation of biodiversity and soil quality (Recital 24, Reg 2018/848). This brief outlook reflects how organic farming is flourishing as an agronomic practice having soil-protecting and enhancing effects, while sustaining eco-functions in soils for the benefit of agricultural land (IFOAM EU GROUP, *The EU Soil Directive – Building the foundations for a quagmire or healthy humus?*, Position paper, 2009, <https://www.organicseurope.bio/content/uploads/2020/06/ifoameu_policy_soil_position_201109.pdf?dd> accessed 03 February 2023, p. 9).

⁵³ See, for instance, Regulation (EC) No 1107/2009 concerning the placing of plant protection products on the market (OJ L 309/1) and Regulation (EU) No 528/2012 on the use of biocidal products (OJ L 167/1), which set requirements for applicants for a new PPP or a new biocidal product to carry out a risk assessment where soil issues are specifically addressed. On this issue, I.L. HEUSER, *Milestones of soil protection in EU environmental law*, in *JEEPL*, 3, 2006, p. 190.

waste products⁵⁴. Second, potential threats to agricultural soil are only addressed by sectorial rules concerning circumscribed situations, despite the broad range of Community instruments that influence soil protection.

Agricultural soil is approached from a productive perspective, which demands that «the preservation of its quality is essential to agricultural production and represents a means through which further fundamental values – human health, environmental protection, consumer rights, food safety – are safeguarded»⁵⁵.

In recent years, the lack of thorough and preventive action for soil protection has prompted a decisive step at the EU policy level. The EU Commission's interest in harmonising soil protection issues has been guided by two main drivers. One is the increasing attention paid to biodiversity by nature conservation legislation. The other concerns the influence exerted by soil protection legislation in force in EU Member States on the internal market⁵⁶.

On this basis, and in the face of legal gaps and overlaps related to soil threats and functions⁵⁷, a Communication was released in 2002⁵⁸ as part of the Sixth Community Environment Action Programme⁵⁹ (EAP) on nature and biodiversity. This document concerns the fields of water and air pollution, initiatives directed at mining waste, and territorial dimensions related to land-use planning⁶⁰. In 2006, instead, a legislative proposal based on Article 175(1)

⁵⁴ On the utilisation of organic substance from organic waste to the soil, in order to tackle the problem of desertification, see F. DE LEONARDIS, *The ecosystem services provided by soil and the importance of its protection: The essential role of organic waste*, in *Riv. quadr. dir. amb.*, n. 1/2022, p. 415 et seq.

⁵⁵ F. VARVELLO-S. MONTALDO, *Agricultural use of land as a global public good*, in *federalism.it*, 3(1), 2013, p. 22.

⁵⁶ G. VAN CALSTER, *Will the EC get a finger in each pie? EC law and policy developments in soil protection and brownfields redevelopment*, in *Journal of Environmental Law*, 16(1), 2004, p. 13.

⁵⁷ N. GLÆSNER-K. HELMING-W. DE VRIES, *Do current European policies prevent soil threats and support soil functions?*, in *Sustainability*, 6, 2014, pp. 9538-9563.

⁵⁸ Commission of the European Communities, *Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - Towards a thematic strategy for soil protection*, COM(2002) 179 final, Brussels.

⁵⁹ Decision No 1600/2002/EC of the European Parliament and of the Council of 22 July 2002 laying down the Sixth Community Environment Action Programme [2002] OJ L 242/1.

⁶⁰ For a detailed examination, see C. OLAZÁBAL, *Overview of the development of EU soil policy: Towards an EU thematic strategy for soil protection*, in *JEEPL*, 3, 2006, pp. 184-189. For information about the background of the Strategy, see Department for Environment, Food and Rural Affairs (DEFRA), *Consultation on the proposed EU soil framework directive and initial regulatory impact assessment*, 2007.

of the EC Treaty established common EU-wide principles and objectives to address the different facets of soil degradation⁶¹. The provisions approached soil sealing to ensure a more rational use of land, together with the identification of areas at risk of erosion, organic matter decline, salinisation, compaction, and landslides. National programs of measures were supposed to guarantee a fair playing field and tackle all the threats to which soils are confronted in each national territory. Data collection on the status of soil added to this framework for a harmonised picture within the EU territory.

Some features of the proposal concerning the agricultural field must be highlighted in our analysis. First, the rationale of the proposal's flexible legal background was to adopt a multi-stakeholder approach that avoids soil contamination and preserves soil functions⁶² while introducing measures to improve knowledge, exchange of information, and best practices⁶³.

Second, for the first time, the Commission connected soil protection with human health, climate change, biodiversity, and food safety⁶⁴. In so doing, it recognised the scale of the problem inherent in soil management and its implications with respect to the EU legislation on agriculture. Third, the principles of proportionality and precaution were evoked by the Commission to guarantee the prevention of soil degradation, and the protection of soil as «a natural resource of common interest»⁶⁵.

Although the proposal was supported by the EU Parliament⁶⁶, several countries opposed its approval⁶⁷. They questioned the value that the act could add to the Union Law in force⁶⁸. Additional reasons relied on political

⁶¹ European Commission, *Proposal for a Directive of the European Parliament and of the Council establishing a framework for the protection of soil*, COM/2006/232 final, on which see *Commission staff working document - Impact Assessment of the Thematic Strategy on Soil Protection*, SEC(2006)620.

⁶² See Recitals 31 and 20, and Arts 1(1) and 9, COM/2006/232.

⁶³ See Recital 30 and Arts 15 and 17, COM/2006/232.

⁶⁴ Recital 2, COM/2006/232.

⁶⁵ See Recitals 10 and 12, and Art 4, COM/2006/232.

⁶⁶ Position of the European Parliament adopted at first reading on 14 November 2007 with a view to the adoption of Directive 2008/.../EC of the European Parliament and of the Council establishing a framework for the protection of soil (EP-PE_TC1-COD(2006)0086).

⁶⁷ Germany, France, The Netherlands, the United Kingdom and Austria.

⁶⁸ Council of the European Union, *Progress report*, 6124/1/10 REV 1, <<http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%207100%202010%20INIT>> accessed 25 February 2023.

considerations⁶⁹, expected costs, and administrative burdens⁷⁰. Codification of soil became a topic of “transboundary relevance” pertaining to Member States’ sovereignty⁷¹, raising concerns about its conformity with the subsidiarity principle⁷². On the one hand, the perspective that a Union intervention is more effective than individual national actions was debated within the Council, with some Member States calling on national primary responsibilities for soil management. On the other, this line of reasoning was dismissed as «not logical» by the Commission⁷³. It highlighted the interaction of soil with other natural resources (i.e., the function of soil as a carbon sink⁷⁴) and, hence, the relevance of soil protection for several community policies, such as the climate change policy⁷⁵.

In May 2014, the Commission’s proposal was withdrawn⁷⁶ because of the national governments’ opposing attitudes, which would not change despite several attempts to reopen the discussion⁷⁷. Different arguments have supported this criticism. While the soil quality goals set forth in it were neither appropriately defined, nor time bound, the room for manoeuvre recognised to

⁶⁹ M. PETERSEN, *European soil protection law after the setback of December 2007 – Existing law and outlook*, in *European Energy and Environmental Law review*, 2008, p. 149.

⁷⁰ Council of the European Union, *Environment*, Press release, 16183/07, <http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/envir/97858.pdf> accessed 25 February 2023.

⁷¹ L. MONTANARELLA-P. PANAGOS, *Soil security for the European Union*, in *Soil Security*, 4, 2021, p. 100009. Nevertheless, scholarly work outlined how in the five countries that blocked the Directive, laws on soil-dependent degradation and contamination are often more restrictive than the proposed EU regulation (P. STANKOVICS-G. TÓTH-Z. TÓTH, *Identifying gaps between the legislative tools of soil protection in the EU Member States for a common European soil protection legislation*, in *Sustainability*, 10, 2018, p. 2886).

⁷² See Protocol (No 2) on the Application of the Principle of Subsidiarity and Proportionality, Annex to the TFEU, Art 5: «Subsidiarity allows Member States to make their national choices in certain matters without challenging the legal harmonization in the EU in that field». For an insightful analysis of the criticalities stemming from this principle, see A. ESTELLA, *The EU principle of subsidiarity and its critique*, Oxford University Press, 2002.

⁷³ L. PHILLIPS, *Opposition to EU soil directive “not logical”, Commission says*, in *EUObserver*, 16 March 2010, <<https://euobserver.com/green-economy/29686>> accessed 28 February 2023.

⁷⁴ C. PAPANICOLAOU, *The proposed new soil framework directive*, in *The Land Remediation Yearbook*, 2007, p. 99.

⁷⁵ The terms of this debate are scrutinized by M. PETERSEN, cit., pp. 149-150.

⁷⁶ European Commission, *Withdrawal of obsolete Commission proposals*, 2014/C 153/03, <<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:C:2014:153:FULL>> accessed 28 February 2023.

⁷⁷ For an analysis on the reasons for the withdrawal, see Y. CHEN, *Withdrawal of European soil framework directive: Reasons and recommendations*, in *Journal of Sustainable Development*, 13(1), 2019, doi:10.5539/jsd.v13n1p1.

Member States and the lack of real incentives for changing land use practices hampered a proper action in favour of soil biodiversity⁷⁸. The text was criticized for not demanding that Member States be proactive or ambitious beyond the prevention and restoration of the worst soil damage. It was also condemned to not draw up legally binding commitments and measures to enforce compliance⁷⁹.

In brief, subsidiarity was invoked by Member States as an “epistemological principle” to protect local and national preferences based on the commitment to policy styles⁸⁰. The differentiation conveyed by resorting to different soil protection regimes was justified for the greater leeway it would allow for expressions of uncertainty, political preference, and local values⁸¹.

Yet, choices made under the auspices of this «epistemic subsidiarity»⁸² reveal not only differences in risk perception but also how institutional designs adopted to assess and allocate the risks and costs of technoscience are shaped by political preferences and national sociotechnical imaginaries⁸³. Consequently, various arguments were advanced in favour of the EU Soil Directive. It was

⁷⁸ CEEweb for Biodiversity, *Soil biodiversity research and policy in the EU*, Position paper, CEEweb for Biodiversity, 2021, p. 9.

⁷⁹ IFOAM EU GROUP, *The EU soil directive*, Position paper, 2011, <https://www.organicseurope.bio/content/uploads/2020/06/ifoameu_policy_soil_position_201109.pdf?dd> accessed 01 March 2023, pp. 5-6.

⁸⁰ One example is the reform to the EU's genetically modified organisms (GMOs) regime that was made by Article 26b of Directive 2001/18/EC (OJ L 106/1), as inserted by Directive 2015/412 (OJ L 68/1). It allows Member States to implement restrictions or prohibitions the cultivation of GMOs in their territory (in connection with an authorization procedure harmonized) for reasons that do not relate to issues of health and safety or the environment. This choice of presenting local governance as a solution to overcome the impasse in GMO decision-making has become a matter of debates and discussions. See L. BODIGUEL, *GMO, conventional and organic crops: From coexistence to local governance*, in *Agriculture and Agricultural Science Procedia*, 8, 2016, pp. 263-269. A further example concerns the adoption of emergency authorisations, which several Member States granted for the restricted use of five neonicotinoids (clothianidin, imidacloprid, thiamethoxam, acetamiprid and thiacloprid) – as active substances in plant protection products (PPPs). Although those measures were adopted in accordance with the regulatory procedure referred to in Article 79(3) of Regulation (EC) 1107/2009 (OJ L 309/1), the national choices have been subject to significant tensions between Member States and the Commission. On this matter, see L. LEONE, *Pesticides in Court: Ruling on the use of neonicotinoids in EU Member States*, in *BioLaw Journal*, 4, 2022, p. 340 et seq.

⁸¹ M. GEELHOED, *Divided in diversity: Reforming the EU's GMO regime*, in *Cambridge Yearbook of European Legal Studies*, 18, 2016, pp. 20-44.

⁸² S. JASANOFF, *Transnational risks and multilevel regulation: A cross-comparative perspective*, in *European Journal of Risk Regulation*, 2, 2013, pp. 133-141.

⁸³ *Ibidem*, p. 141.

stressed that the benefits of cross-border protection measures outweigh the costs stemming from soil decontamination and that harmonisation does not lead to additional effort, as subsidiarity requires EU regulations to only intervene where action is needed. It was also pointed out that institutional action contributes to better monitoring and exchange of knowledge about the soil condition⁸⁴.

Two further benefits were linked to a centralized policy action: greater management of soil and the accordance of soil protection obligations of land administrators to increase the stability of the internal market. However, only recently, the recurring mantra that soil is different from field to field, and from country to country, no longer appears suitable to extend EU common law. The persistent *status quo* undermining the normative puzzle has been dismantled to rationalize the variety of fields concerned and support EU cultural heritage and landscapes⁸⁵.

In 2021, the Commission announced a novel Strategy for 2030 to deliver a combination of voluntary and legislative action to tackle soil degradation against a “business as usual” baseline⁸⁶. At the core of this policy, the concept of soil health⁸⁷ is an emerging paradigm for efficiently coping with soil management⁸⁸ and fostering the sustainable use of soil in Member States⁸⁹. The Parliament welcomed it from the perspective of a future legislative act

⁸⁴ N. SAUER, *Soil: Worth standing your ground for. Arguments for the soil framework directive*, EEB, 2011, pp. 12-13.

⁸⁵ Decision 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 “Living well, within the limits of our planet” [2013] OJ L 354/171.

⁸⁶ European Commission, *Call for evidence for an impact assessment*, Ref. Ares(2022)1132884 - 16/02/2022.

⁸⁷ 93.53% of the stakeholders replying to the open public consultation find protecting soil health/quality and restoration at EU level important or very important (EUROPEAN COMMISSION, *Healthy soils – New EU soil strategy*, 2021, <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12634-Healthy-soils-new-EU-soil-strategy/public-consultation_en> accessed 18 March 2023).

⁸⁸ P. PANAGOS ET AL., *Soil priorities in the European Union*, in *Geoderma Regional*, 29, 2022, e00510.

⁸⁹ For background information on the Strategy, see European Commission, *Commission staff working document - Accompanying the document - Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - EU Soil Strategy for 2030. Reaping the benefits of healthy soils for people, food, nature and climate*, SWD(2021) 323 final, Brussels.

addressing all of the main soil threats, including common definitions, clear targets, and a monitoring framework⁹⁰.

It aimed to identify and promote innovative farming practices that can prevent the threat of soil salinisation, reduce the overuse of synthetic fertilisers, and offer incentives for better nitrogen management at the farm level⁹¹. Likewise, it called on Member States «to strengthen the restoration and sustainable use of soil as a tool for climate policy in their national energy and climate plans [...] and to preserve, restore, and enhance carbon sinks»⁹².

This is because carbon pricing and market-based instruments, together with regulatory intervention and targeted support for innovation in low-carbon sustainable technologies, are deemed essential for the alignment between existing policy frameworks and climate objectives⁹³. Innovation in low-carbon agricultural practices is expected to drive the transition towards a more resilient agri-food sector by reducing greenhouse gas (GHG) emissions while responding to growing food demands⁹⁴.

⁹⁰ European Parliament, *Resolution of 28 April 2021 on soil protection* (2021/2548(RSP)), para. 10. This specific demand followed the Committee of the Regions' proposal for a novel EU directive on agricultural soils through which to halt the decrease in their organic matter content, stop erosion, and prioritise soil life in agricultural practices (European Committee of the Regions, *Opinion of 5 February 2021 on agro-ecology*, Rapporteur: Guillaume CROS (FR/Greens), NAT-VII/010, para. 56).

⁹¹ *Ivi*, paras 33 to 35.

⁹² *Ivi*, para 50.

⁹³ A deep overview on this topic is given by Organisation for Economic Cooperation and Development (OECD), *Aligning policies for a low-carbon economy*, Paris, 2015, <https://doi.org/10.1787/9789264233294-en>.

⁹⁴ Indeed, within the framework of the sustainability ambitions outlined in the EU flagship agrifood policy, the Green Deal's targets relate, inter alia, to the 2020 Farm to Fork strategy aiming to make food systems healthy and greener, and the digitalization of the agrifood chain for a climate-smart agriculture. See European Commission, *Communication from the Commission. The European Green Deal*, COM(2019) 640 final, Brussels; European Commission, *A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system*, COM/2020/381 final, Brussels. For an analysis, see JOSSE DE BAERDEMAEKER ET AL., *Artificial intelligence in the agrifood sector. Applications, risks and impacts*, EPRS, European Parliament, 2023; P. LATTANZI, *Il «New Green Deal», la PAC 2021-27 e la sostenibilità nelle produzioni alimentari*, in P. BORGHI-I. CANFORA-A. DI LAURO-L. RUSSO (eds), *Trattato di diritto alimentare italiano e dell'Unione europea*, Milano, pp. 705-712; S. MANSERVISI, *La sostenibilità*, in F. ALBISINNI-L. COSTATO (eds), *Trattato breve di diritto agrario italiano e dell'Unione europea. Agricoltura, pesca, alimentazione e ambiente*, Padova, 2023, pp. 170-179; J. MCFADDEN ET AL., *The digitalisation of agriculture: A literature review and emerging policy issues*, OECD Food, Agriculture and Fisheries Papers, No. 176, Paris, 2022, <https://doi.org/10.1787/285cc27d-en>; SAPEA (Science Advice for Policy by European Academies), *Towards sustainable food consumption: Policy landscape*, Berlin, 2023.

Still, the use of CO₂ as a feedstock faces a range of technical, environmental, and economic challenges that need to be carefully scrutinized from scientific and legal points of view to inform future policy decisions in this field⁹⁵. In the Commission's proposal for a low-carbon transition, the soil theme constitutes the glue linking the problems of climate change (and thus of emissions and absorption of GHG) with the issues of erosion, biodiversity, hydrogeological balance, and organic matter. The next section provides an overview of the regulatory steps that Europe has decided to take. It inquires whether legislative intervention is on the right avenue to face soil threats in agriculture, while boosting climate-smart agricultural practices in EU Member States.

3. Framing soil in climate policy: A matter of carbon removal

Soil can naturally store high amounts of carbon, and its management can be useful in reducing short-term atmospheric CO₂ concentrations, making it a viable option for developing longer-term emission reduction solutions⁹⁶. Application of soil amendments such as compost or biochar, conservation tillage, agroforestry, or whole orchard recycling has been proven to ameliorate soil structure, which promotes long-term soil health and productivity of the land⁹⁷. This role in maintaining agricultural productivity in the face of climate change issue, while mitigating GHG emissions⁹⁸, propelled soil carbon management to gain traction on the EU policy agenda.

The EU Commission's Farm to Fork Strategy is illustrative in this respect, as it acknowledges the need for farmers to make the best use of nature-based, technological, digital, and space-based solutions to deliver better environmental results and increase climate resilience⁹⁹. In this respect, carbon

⁹⁵ SAM (Scientific Advice Mechanism), *Scoping paper: Novel carbon capture and utilisation technologies: research and climate aspects*, European Commission, <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://research-and-innovation.ec.europa.eu/system/files/2020-02/hlg_sam_scoping_paper_ccu.pdf> accessed 10 October 2023.

⁹⁶ P. SMITH, *Soils and climate change*, in *Current Opinion in Environmental Sustainability*, 4(5), 2012, pp. 539-544.

⁹⁷ J. AERTSENS-L. DE NOCKER-A. GOBIN, *Valuing the carbon sequestration potential for European agriculture*, in *Land Use Policy*, 31, 2013, pp. 584-594.

⁹⁸ See OECD, *Enhancing climate change mitigation through agriculture*, Paris, 2019.

⁹⁹ COM/2020/381 final, cit., p. 5.

farming is understood as an innovative business model that can trigger a climate-neutral EU economy.

The term 'carbon farming' refers to the plurality of agronomic practices, land use changes, and technological solutions that deliver, alternatively or in combination, several outcomes: carbon sequestration and subsequent storage in biomass above/below ground and in agricultural soils, avoidance of future CO₂ and other GHG emissions, and reduction of existing CO₂ and other GHG emissions¹⁰⁰. The term also alludes to a business model that provides incentives (privately or publicly funded) for farmers to adopt the agricultural practices mentioned above. However, scientific uncertainties that surround the promised mitigation outcomes¹⁰¹ and socio-economic benefits to farmers create challenges that are difficult to resolve¹⁰². One is the design of carbon farming incentives¹⁰³. Further examples include the modalities of monitoring, reporting, and verification of the carbon farming mitigation impact, as well as the permanence and additionality of the impact¹⁰⁴.

The 2021 Communication on Sustainable Carbon Cycles sets out short-term actions to upscale carbon farming as a practice, fostering a new industrial value chain for the sustainable capture, recycling, transport, and storage of carbon¹⁰⁵. From this perspective, a regulatory framework is on its way to align farmers' incentives with societal benefits¹⁰⁶. The proposed legislation for carbon removals certification has been welcomed by a large majority (89%) of

¹⁰⁰ H. McDONALD ET AL., *Carbon farming – Making agriculture fit for 2030*, Study for the Committee on Environment, Public Health and Food Safety (ENVI), Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, 2021, p. 11.

¹⁰¹ K. BURKE, *Soil carbon sequestration on farms alone won't absolve our daily emission sins*, in *The Guardian*, 18 December 2021, <<https://www.theguardian.com/australia-news/2021/dec/19/soil-carbon-sequestration-on-farms-alone-wont-absolve-our-daily-emission-sins>> accessed 25 March 2023.

¹⁰² S. ROE ET AL., *Land-based measures to mitigate climate change: Potential and feasibility by country*, in *Global Change Biology*, 27, 2021, pp. 6025-6058.

¹⁰³ See A. SCHEID ET AL., *Carbon farming co-benefits: Approaches to enhance and safeguard biodiversity*, Ecologic Institute/IEEP, 2023.

¹⁰⁴ H. McDONALD ET AL., cit., p. 22 et seq.

¹⁰⁵ European Commission, *Communication from the Commission to the European Parliament and the Council - Sustainable carbon cycles*, COM(2021) 800 final, Brussels, p. 2.

¹⁰⁶ European Commission, *Proposal for a Regulation of the European Parliament and the Council establishing a Union certification framework for carbon removals*, COM(2022) 672 final, Brussels.

the stakeholders who replied to the public consultation¹⁰⁷. A level-playing field within the internal market stands at the core of the regulatory picture with the aim of ensuring long-term carbon storage and environmental sustainability.

This is because of the two main drivers underpinning the assessment and comparison of the quality of carbon removals. The first concerns the methodologies necessary to quantify carbon removals, incentivize the long-term storage of carbon, and encompass broader sustainability impacts. The second pertains to the heterogeneity of carbon removal solutions in terms of maturity, cost-effectiveness, and related monitoring costs.

To address these issues, the proposal is based on Article 192(1) TFEU, which recognises the EU's right to act in pursuit of its environmental policy objectives. As these purposes comprise the preservation, protection, and improvement of the quality of the environment, together with the prudent and rational use of natural resources, the legislative act is rooted in the Circular Economy Action Plan¹⁰⁸ and the existing climate change legislation¹⁰⁹, and in full respect of biodiversity and zero-pollution goals¹¹⁰.

Three main pillars support the voluntary certification framework. The first is defined in Articles 4-8 of the proposal. They set out four quality criteria,

¹⁰⁷ European Commission, *Commission staff working document – Executive summary of the impact assessment report - Accompanying the document – Proposal for a Regulation of the European Parliament and of the Council establishing a Union certification framework for carbon removals*, SWD(2022) 378 final, Brussels. For an analysis of the strengths and weaknesses of the European Commission's impact assessment, see A. RAKŠTELYTĖ, *Certification of carbon removals*, Briefing, EPRS, European Parliament, 2023.

¹⁰⁸ European Commission, *Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions – A new circular economy action plan for a cleaner and more competitive Europe*, COM(2020) 98 final, Brussels.

¹⁰⁹ In particular: Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006 [2009] OJ L 140/114; Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 601/2012 [2018] OJ L 334/1; Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU [2018] OJ L 156/1.

¹¹⁰ European Commission, *Communication to the Commission – Greening the Commission*, C(2022) 2230 final, Brussels.

indicating how to ensure quantification, additionality and baselines, long-term storage, and sustainability. Their cumulative compliance makes carbon removals eligible for certification.

Articles 9 and 10 outline the key elements of the certification process, which consists of two principal steps. The first stage is based on information exchange between an operator (or a group of operators) and a certification body. This information concerns carbon removal activity and its expected compliance with the quality criteria. After carrying out an audit to verify the operator's claims, the certification body shall issue a certification audit report and a certificate, provided that the quality criteria have been met.

The other stage relies on periodic re-certification audits, which verify the correct implementation of carbon removal activity and the generated carbon benefit. If compliance with the quality criteria is ascertained, the certification body issues a re-certification audit report and an updated certificate. Article 10 sets forth the requirements of competence, independence, and transparency for certification bodies to ensure their expertise and impartiality in the certification audits. Supervision of the operation carried out by certification bodies¹¹¹ is in the hands of Member States, which shall inform the certification body and the relevant certification scheme thereof in cases of infringements.

As for the third pillar determined in Chapter 4, requirements concern the governance, transparency, and accountability of the certification schemes used by the operators. Article 13 states that «only a certification scheme recognised by the Commission by means of a decision may be used by operators or group of operators to demonstrate compliance with this Regulation». Certification schemes shall operate according to transparency rules pertaining to internal management and monitoring, handling of complaints and appeals, stakeholder consultation, appointment and training of certification bodies, and development and management of registries¹¹².

The establishment of interoperable public registries that use automated systems for evidence of carbon removal activities and carbon removal units is imposed by Article 12. Annual reports on the operations of certification schemes shall be submitted to the Commission and made publicly available in

¹¹¹ They are appointed by certification schemes and accredited by a national accreditation authority.

¹¹² Art 11(1), COM(2022) 672 final.

full, except for commercially sensitive information¹¹³. Importantly, the proposed Regulation shall be kept under review not only in light of Union legislation's developments and technological innovation, but also with regard to international law¹¹⁴ and market developments in the field of carbon removal.

All in all, the legal framework so conceived tries to answer the Parliament's call for a well-defined set of rules establishing, on the one hand, certification for nature-based and technological carbon removal solutions and, on the other, «a robust and transparent carbon accounting system that acts as a catalyst for investment in circular economy products and processes»¹¹⁵. The legal text is in line with the Council's Conclusions on the necessity to ensure economic value for practices that increase carbon removal and storage, based on scientifically proven measurement requirements¹¹⁶. However, the proposal suffers from some limitations that will certainly be at the centre of intense debates during the future stages of the co-decision process.

One concern is regarding definitions. This regulation addresses distinct types of carbon removal activities, namely geological storage, carbon farming, and carbon storage products. A high degree of confusion concerning the features of these activities has been lamented¹¹⁷, with a lack of distinction between removal and reduction as proposed by the Intergovernmental Panel on Climate Change (IPCC)¹¹⁸. Further aspects are not properly defined: the definition of high-quality removals, the characteristics of the additionality

¹¹³ Art 14(1) and (2), COM(2022) 672 final.

¹¹⁴ Such as the United Nations Framework Convention on Climate Change and the Paris Agreement.

¹¹⁵ European Parliament, *Resolution of 10 February 2021 on the new circular economy action plan (2020/2077(INI))*, paras 18 and 46.

¹¹⁶ Council of the EU, *Council Conclusions on the Commission communication on sustainable carbon cycles in the agricultural and forestry sectors*, No. Cion doc.: 15045/21, Brussels, 2022, paras 10 and 11.

¹¹⁷ Indeed, the three typologies of carbon removals identified by the proposal contain different methods that vary significantly in their traits, namely on their permanence and risk of reversal, on their side effects and their accounting accuracy. For an overview of the landscape of carbon dioxide removal in the context of existing voluntary carbon markets, see M.P. ARAGONÈS -A. ŠERDONER-S.E. TANZER, *Drum: Why governments need to regulate carbon removal and voluntary markets guidance document for policy makers*, in *Bellona Europa*, 31 August 2022, <<https://bellona.org/publication/the-carbon-credits-conundrum-why-governments-need-to-regulate-voluntary-markets>> accessed 17 March 2023.

¹¹⁸ P.R. SHUKLA ET AL. (eds), *Climate change 2022 – Mitigation of climate change – Summary for Policymakers*, Working Group III Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC, 2022, p. 40.

testing, and the modalities through which permanence is tackled across carbon removal activities of a very different nature¹¹⁹.

An intricate question concerns how the environmental integrity of the system will be ensured, given the lack of clarity on how diverse types of certificates will be used and the indication of tools ensuring that harmful practices are excluded¹²⁰. Other elements missing in the legal text pertain to specific carbon removal targets. In addition to the overall EU-level objective of 310 Mt CO₂ equivalent of net removals in the LULUCF (land use, land-use change, and forestry) sector in 2030¹²¹, the proposal does not include any other targets specifically for removals, nor does it address the high risks of reversal. Besides, by not explicitly excluding the trading of removal certificates under the Emission Trading System (ETS) or the Effort Sharing Regulation (ESR), the draft regulation risks to be a mere “greenwashing exercise,” paving the way for uncertain carbon offsets to delay climate action.

With all these vague details or those to be filled in through delegated acts or implementing regulations, the Commission’s act has been echoed by diverging criticisms¹²². Associations like FoodDrinkEurope and the European Landowners’ Organisation welcomed it as a «great opportunity to further decarbonise the food sector», while achieving the Green Deal’s climate targets¹²³. The IFOAM Organics Europe and COPA-COGECA cast some doubts on the criterion of «additionality», which is prescribed for all carbon removal certificates. Implementing that criterion – they claimed – could pose

¹¹⁹ E. TAMME, *EU enters the race for carbon removal certification*, 2022, <<https://evetamme.com/2022/11/30/eu-enters-the-race-for-carbon-removal-certification/>> accessed 10 March 2023.

¹²⁰ Climate Action Network Europe, *The Commission’s proposal to create a certification framework for carbon removals risks creating big loopholes in EU climate action*, Press release, 30 November 2022, <<https://caneurope.org/the-commissions-proposal-to-create-a-certification-framework-for-carbon-removals-risks-creating-big-loopholes-in-eu-climate-action/>> accessed 10 March 2023.

¹²¹ Council of the EU, *“Fit for 55”: Provisional agreement sets ambitious carbon removal targets in the land use, land use change and forestry sector*, 2022, <<https://www.consilium.europa.eu/en/press/press-releases/2022/11/11/fit-for-55-provisional-agreement-sets-ambitious-carbon-removal-targets-in-the-land-use-land-use-change-and-forestry-sector/>> accessed 10 March 2023.

¹²² For a general perspective on stakeholder view, see L. JENSEN, *A Union certification framework for carbon removals*, Briefing, EPRS, European Parliament, 2023.

¹²³ J. DAHM, *EU Commission wants farmers, landowners to lead carbon removal push*, in *Euractiv*, 30 November 2022, <<https://www.euractiv.com/section/agriculture-food/news/eu-commission-wants-farmers-landowners-to-lead-carbon-removal-push/>> accessed 10 March 2023.

challenges to farmers that already operate under a certified sustainability scheme like the EU organic label¹²⁴.

Critical voices also came from some environmental NGOs, which warned of carbon removal schemes as a potential form of greenwashing that primarily favours carbon markets, instead of pointing to deep and drastic emission cuts. An additional shortcoming concerns the management of the EU-stamped carbon removal certificates. According to the climate association Carbon Market Watch, the absence of details on the role of removals in EU climate action, together with the permanence of storage and liability for reversals, and the risk of creating loopholes may undermine EU climate goals¹²⁵. Further concerns highlighted the peril of leaving to delegated acts to define important issues, such as the establishment of certification methodologies for different carbon removal activities¹²⁶.

In sum, hundreds of organizations acknowledged how nature-based solutions and future technologies of carbon dioxide removal «pose huge risks for land speculation and land-grabbing from small-scale farmers and peasants, threatening food sovereignty in the EU and around the world»¹²⁷. They suggested that carbon farming should be promoted to propel the transition towards a multi-dimensional approach that considers nature restoration, climate adaptation, nutrition security, and rural livelihoods¹²⁸.

Such an approach should focus on how novel and existing public funds, such as the CAP, can be used to incentivise management practices that support soil health and biodiversity¹²⁹. This consideration brings interesting questions to the forefront: How is carbon farming integrated into the CAP 2023-2027? To

¹²⁴ *Ibidem*.

¹²⁵ S. FRANK, *The UN-backed “Carbon Removal Pioneers” stoke the development dreams of African countries but crash against the reality of climate science*, in *Carbon Market Watch*, 09 December 2022, <<https://carbonmarketwatch.org/2022/12/09/carbon-removals-are-no-magic-climate-or-development-bullet/>> accessed 10 March 2023.

¹²⁶ See Art 8, COM(2022) 672 final.

¹²⁷ Real Zero Europe, Statement, 29 November 2022, <https://docs.google.com/document/d/e/2PACX-1vT5vUTPCF-sDaJ3lfo90u1USK2fbTNX3iNajoskCPBfUjqd3L_W5ntv8pVYRZFTYA/pub?urp=gmail_link> accessed 12 March 2023.

¹²⁸ C. NYSENS, *Carbon farming for climate, nature, and farmers report*, EEB, 2021.

¹²⁹ IFOAM Organics Europe, *Position paper on carbon farming and the revision of the LULUCF Regulation. Finding synergies between climate action and biodiversity protection*, 2022, <https://www.organicseurope.bio/content/uploads/2022/04/IFOAMEU_advocacy_climate-change_position-paper_042022.pdf?dd> accessed 13 March 2023, p. 5.

what extent is CAP suitable for supporting agronomic practices that foster protection and restoration measures for soils in agriculture? Which are the drawbacks of the reformed “green architecture” when dealing with the health and management of agricultural soil?

4. *Soil and carbon farming in the CAP 2023-2027*

Given the close link between climate and agricultural policy¹³⁰, CAP is expected to fuel more sustainable soil management practices¹³¹. In 2020, the Commission included carbon farming in its Recommendations to Member States' CAP strategic plans by stressing how knowledge-intensive farming can actively contribute to preventing soil erosion and depletion¹³².

However, a report from the EU Court of Auditors found that although over a quarter of all 2014-2020 of EU agricultural spending was earmarked for climate change, there has been no improvement in GHG emissions from agriculture since 2010¹³³. CAP measures did not lead to an overall increase in carbon content stored in soils and plants, nor did emissions from fertiliser and manure on soils decrease¹³⁴. Accordingly, the Court recommended that the

¹³⁰ For insightful comments on this matter, see A. JANNARELLI, *Agricoltura sostenibile e nuova Pac: problemi e prospettive*, in *Riv. dir. agr.*, 1, 2020, pp. 23-42; S. MASINI-V. RUBINO (eds), *La sostenibilità in agricoltura e la riforma della Pac*, Bari, 2021; G. STRAMBI, *Condizionalità e greening nella Pac: è abbastanza per il clima?*, in *Agricoltura-Istituzioni-Mercati*, 2, 2016, pp. 64-88.

¹³¹ For an outlook on the effectiveness, efficiency, relevance and coherence of the CAP instruments and measures addressing sustainable soil management and soil quality in the period 2024-2020, see European Commission, *Evaluation support study on the impact of the CAP on sustainable management of the soil*, Final report, Directorate-General for Agriculture and Rural Development, Direction C – Strategy, Simplification and Policy Analysis, European Union, 2021.

¹³² European Commission, *Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions – Recommendations to the Member States as regards their strategic plan for the Common Agricultural Policy*, COM/2020/846 final, Brussels.

¹³³ European Court of Auditors, *Common Agricultural Policy and climate. Half of EU climate spending but farm emissions are not decreasing*, Special report No. 16, Luxembourg, 2021, p. 17. For some reflections, see M. ALABRESE-E. CRISTIANI, *Clima e impegni internazionali nell'attuazione della Pac*, in *Riv. dir. agr.*, 2, 2022, p. 238 et seq.

¹³⁴ European Court of Auditors (n 133), p. 52 et seq.

Commission acts through the CAP to reduce emissions from agriculture and cultivated drained organic soils¹³⁵.

On December 2, 2021, the agreement on CAP reform was formally adopted for a fairer, greener, and more performance-based CAP¹³⁶. The novel regime, which generally applies from January 1, 2023, covers three Regulations establishing rules on the financing, management, and monitoring of the CAP¹³⁷, on support for national CAP strategic plans¹³⁸, and on the common organisation of the agricultural markets¹³⁹.

The so-called «delivery model» focuses on the performance and results achieved by Member States with respect to the objectives and targets set forth¹⁴⁰, as well as on the intention to rebalance responsibilities between the EU

¹³⁵ European Court of Auditors (n 133), p. 91 et seq.

¹³⁶ For a general perspective and insightful comments on the CAP 2023-2027, see L. COSTATO-L. RUSSO-L. PETRELLI, *La politica agricola comune*, in F. ALBISINNI-L. COSTATO (eds), *Trattato breve di diritto agrario italiano e dell'Unione europea. Agricoltura, pesca, alimentazione e ambiente*, Padova, 2023, pp. 77-110; L. COSTATO-L. RUSSO, *Corso di diritto agrario italiano e dell'Unione europea*, Milano, 2023, pp. 121-169; A. LANGLAIS, *The new Common Agricultural Policy: Reflecting an agro-ecological transition. The legal perspective*, in *Review of Agricultural, Food and Environmental Studies*, 104(1), 2023, <https://doi.org/10.1007/s41130-022-00183-1>; M.R. PUPO D'ANDREA, *Le novità della Pac 2023-2027*, in *Agriregionieuropa*, Numero Speciale – Agricalabriaeuropa, 1, 2021, p. 157 et seq. See also the Special Issues of the *Rivista di diritto agrario*, No. 1/2020 and 2/2022.

¹³⁷ Regulation (EU) 2021/2116 of the European Parliament and of the Council of 2 December 2021 on the financing, management and monitoring of the common agricultural policy and repealing Regulation (EU) No 1306/2013 [2021] OJ L 435/187.

¹³⁸ Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013 [2021] OJ L 435/1.

¹³⁹ Regulation (EU) 2021/2117 of the European Parliament and of the Council of 2 December 2021 amending Regulations (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products, (EU) No 1151/2012 on quality schemes for agricultural products and foodstuffs, (EU) No 251/2014 on the definition, description, presentation, labelling and the protection of geographical indications of aromatised wine products and (EU) No 228/2013 laying down specific measures for agriculture in the outermost regions of the Union [2021] OJ L 435/262.

¹⁴⁰ According to Recital 3 of Reg 2021/2115: «The CAP should be based on delivery of performance («the delivery model»). Therefore, the Union should set the basic policy parameters, such as the objectives of the CAP and its basic requirements, while Member States should bear greater responsibility as to how they meet those objectives and achieve targets». On this aspect, see R. CAGLIERO-N. D'ALICANDRO-B. CAMAIONI, *Il New delivery model e la lettura della*

and national governments through enhanced subsidiarity¹⁴¹. Crucial elements are the CAP strategic plans to be developed by each Member State¹⁴² and the national systems of administration, coordination, and control to be established together with a reformed system of reporting by Member States to the Commission¹⁴³.

It is a more result-oriented CAP, which retains the two Pillars and agricultural funds¹⁴⁴ supporting national programs to achieve three general objectives¹⁴⁵ and nine specific objectives that are based on cross-compliance and greening measures from the 2014-2022 CAP¹⁴⁶.

Soil protection is covered by the fifth CAP objective, which intends to «foster sustainable development and efficient management of natural resources such as water, soil, and air, including by reducing chemical dependency». However, the two impact indicators linked to this goal only cover soil carbon

performance nella Pac 2023-27, tra opportunità, criticità e incertezze, in *Agriregionieuropa*, Numero speciale - Agricalabrieuropa, 4, 2021.

¹⁴¹ «Enhanced subsidiarity makes it possible to better take into account local conditions and needs and the particular nature of agricultural activity, which results from the social structure of agriculture and from structural and natural disparities between the various agricultural regions, tailoring the support to maximise the contribution to the achievement of Union objectives» (Recital 3, Reg 2021/2115). On this matter, see F. ALBISINNI, *La nuova Pac e le competenze degli Stati membri tra riforme annunciate e scelte praticate*, in *Riv. dir. agr.*, 1, 2020, pp. 43-67.

¹⁴² See D. GADBIN, *Quel cadre juridique pour les plans stratégiques relevant de la Pac? L'exemple français*, in *Riv. dir. agr.*, 2, 2022, pp. 166-179; S. MASINI, *I piani strategici in Italia: il ruolo del Mipaaf e delle Regioni*, in *Riv. dir. agr.*, 2, 2022, pp. 257-273; J. MCELDOWNEY-R. ROSSI, *CAP strategic plans. Issues and expectations for agriculture*, EPRS, European Parliament, 2021. For an overview of the CAP Strategic Plans for each EU country that have been formally approved by the EU Commission, as well as the Decisions finalising the approval procedure, see European Commission, *Documents relating to the approval of the CAP Strategic Plans*, <https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans/approved-csp-0_en> accessed 15 March 2023.

¹⁴³ See B. FÄHRMANN-R. GRAJEWSKI, *Will the future CAP lead to less implementation costs and higher impacts of rural development programmes?*, European Association of Agricultural Economists, 2018.

¹⁴⁴ They are the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD), whose rules are laid down in Title IV of Reg 2021/2115. While the EAGF finance types of intervention in the form of direct payments and types of intervention in certain sectors, the EAFRD addresses types of intervention for rural development.

¹⁴⁵ They aim to: (a) foster a smart, competitive, resilient and diversified agricultural sector ensuring long-term food security; (b) support and strengthen environmental protection, including biodiversity, and climate action and to contribute to achieving the environmental and climate-related objectives of the Union, including its commitments under the Paris Agreement; (c) strengthen the socio-economic fabric of rural areas» (Art 5, Reg 2021/2115).

¹⁴⁶ See Art 6, Reg 2021/2115.

and soil erosion¹⁴⁷. This implies that several soil threats, such as compaction and salinisation, have not been addressed by the novel agenda.

The CAP's «environmental and climate architecture»¹⁴⁸ rests on a renewed model of «enhanced conditionality»¹⁴⁹, on so-called eco-schemes that are mandatory for Member States¹⁵⁰, and on specific economic support for environmental and climate commitments and other management commitments, as defined under Pillar II¹⁵¹.

With regard to conditionality¹⁵², CAP payments are conditional upon a set of statutory management requirements (SMRs) and good agricultural and environmental conditions (GAECs)¹⁵³, which are established in CAP strategic plans, as listed in Annex III of Reg. 2021/2115. GAECs that are relevant to soil protection and quality comprise include: tillage management, reducing the risk of soil degradation and erosion, considering the slope gradient (GAEC 5), minimum soil cover to avoid bare soil in periods that are most sensitive (GAEC 6), and crop rotation in arable land, except for crops growing under water (GAEC 7).

An analysis carried out by the European Environmental Bureau (EEB) showed that conditionality requirements have been weakly implemented by

¹⁴⁷ They are: I.11 Enhancing carbon sequestration: Soil organic carbon in agricultural land and I.13 Reducing soil erosion: Percentage of agricultural land in moderate and severe soil erosion. See European Commission, *CAP specific objectives - Brief No 5: Efficient soil management*, <https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/cap-specific-objectives-brief-5-soil_en.pdf> accessed 16 March 2023.

¹⁴⁸ See Art 109(2), Reg 2021/2115. For some reflections, see H. GUYOMARD ET AL., *How the green architecture of the 2023–2027 Common Agricultural Policy could have been greener*, in *Ambio*, 52(8), 2023, pp. 1327-1338; D. MARANDOLA-F. VANNI, *Le sfide della nuova architettura verde della Pac post 2020*, in *Agriregionieuropa*, 15(59), 2019, p. 25 et seq.

¹⁴⁹ See E. DE MEO-R. ROMA-A. DE BONI, *Il nuovo sistema dei pagamenti diretti nella riforma della Pac 2023-27*, in *Riv. dir. agr.*, 2, 2022, pp. 274-288; S. MASINI, *Greening e adempimento degli obblighi di condizionalità ambientale da parte delle imprese*, in *Riv. dir. agr.*, 1, 2020, pp. 140-166.

¹⁵⁰ See N. LUCIFERO, *I regimi ecologici volontari e la loro attuazione a livello nazionale*, in *Riv. dir. agr.*, 2, 2022, pp. 289-320; T. RUNGE ET AL., *Implementation of eco-schemes in fifteen European Union Member States*, in *EuroChoices*, 21(2), 2022, pp. 19-27.

¹⁵¹ See P. LATTANZI, *Accesso alle misure di sviluppo rurale e contratti agroambientali*, in *Riv. dir. agr.*, 1, 2020, pp. 68-101; G. MIRIBUNG, *Lo sviluppo rurale nell'ambito della nuova Politica Agricola Comune (PAC): una prima analisi*, in I GEORGOFILI, *Atti della Accademia dei Georgofili*, Anno 2019 – Serie VIII – Vol. 1, Firenze, 2020, pp. 242-260; L. RUSSO, *Le “nuove” misure agroambientali della Pac 2023-27: quali novità?*, in *Riv. dir. agr.*, 2, 2022, pp. 142-165.

¹⁵² Art 12, Reg 2021/2115.

¹⁵³ Art 13, Reg 2021/2115.

Member States; consequently, more ambitious baseline requirements are needed to prevent further soil deterioration¹⁵⁴.

Eco-schemes constitute the new element provided under Pillar I¹⁵⁵. They incentivize voluntary farming practices that are beneficial to the climate, environment, and animal welfare in exchange for basic income support for sustainability (BISS) or complementary redistributive income support for sustainability (CRISS). Among the areas of action covered by the eco-schemes, Article 31 of Reg. 2021/2115 mentions the «prevention of soil degradation, soil restoration, improvement of soil fertility, nutrient management, and soil biota». In a 2021 list of agricultural practices that can be supported by eco-schemes, the Commission included carbon farming and other practices beneficial for soil, from erosion, prevention strips, and wind breaks, to the establishment or maintenance of terraces and strip cropping¹⁵⁶.

Yet, some problematic aspects affect the result indicators, providing information on the ambitions of Member States with reference to improving soil carbon storage and soil protection through voluntary commitments. Indicators R.14 (Carbon storage in soils and biomass¹⁵⁷) and R.19 (Improving and protecting soils¹⁵⁸) include values between 0% and 85%, with the majority of Member States choosing target values below 50%¹⁵⁹.

Therefore, incentives through eco-schemes should be increased to safeguard and maintain healthy soils in the long term¹⁶⁰. The same conclusion can be drawn as regards the agri-environment-climate measures funded under Pillar II. They consist of grant payments provided by Member States to farmers

¹⁵⁴ EEB-BirdLife International, *Soil and carbon farming in the new CAP: Alarming lack of action and ambition*, BirdLife Europe/EEB, 2022, pp. 5-6.

¹⁵⁵ Art 31, Reg 2021/2115.

¹⁵⁶ European Commission, *List of potential agricultural practices that eco-schemes could support*, 2021, <https://agriculture.ec.europa.eu/system/files/2021-01/factsheet-agri-practices-under-ecoscheme_en_0.pdf> accessed 16 March 2023.

¹⁵⁷ R.14 represents the share of utilised agricultural area (UAA) under supported commitments to reduce emissions or to maintain or enhance carbon storage (including permanent grassland, permanent crops with permanent green cover, agricultural land in wetland and peatland).

¹⁵⁸ R.19 represents the share of utilised agricultural area (UAA) under supported commitments beneficial for soil management to improve soil quality and biota (such as reducing tillage, soil cover with crops, crop rotation included with leguminous crops).

¹⁵⁹ EEB-BirdLife International, cit., p. 7.

¹⁶⁰ T. NEMCOVÁ ET AL., *New CAP unpacked and unfit*, BirdLife Europe/EEB, 2022, <https://eeb.org/wp-content/uploads/2022/12/New_CAP_Unpacked-6.pdf> accessed 26 March 2023, p. 44.

or other beneficiaries «who undertake, on a voluntary basis, management commitments which are considered to be beneficial to achieving one or more of the specific objectives set out in Article 6(1) and (2) of Reg. 2021/2115»¹⁶¹. To December 2022, it results that voluntary measures adopted for the protection and maintenance of healthy soils are few and not sufficiently focused on soil health. Moreover, some of them offer limited added value for soil carbon sequestration¹⁶².

What considerations can be drawn from this outlook? Undoubtedly, the legal framework designed for CAP 2023-2027 reveals a greater environmental ambition. It is strongly oriented toward multifunctional EU agriculture, which produces positive externalities for the community, even with respect to soil health management¹⁶³. For some scholars, though, the reorganization of governance under the principle of subsidiarity remains problematic. The transfer of power makes it difficult to justify it on the grounds of substantive simplification of the CAP¹⁶⁴. The idea of equating the delegation of powers to simplification is de facto not credible. The danger lies in a potential drift by national policies toward specific national interests rather than the pursuit of social objectives, thereby shattering the idea of a common policy¹⁶⁵.

Thus, more ambitious climate-resilient agronomic practices in line with agroecological principles are suggested as pivotal methods to reconcile sustainable land development with healthy soils¹⁶⁶. This urgency requires Member States to rapidly improve their soil monitoring and set clear targets to halt soil degradation and restore soils.

This perspective aligns with an integrated model of agriculture that consolidates novel environmental, societal, and ethical sensibilities, while respecting individual national production vocations. For instance, the knowledge exchange and farm advisory services envisaged by the CAP *post-*

¹⁶¹ Art 70(2), Reg 2021/2115.

¹⁶² *Ivi*, p. 54.

¹⁶³ On this matter, see EUROPEAN COMMISSION, *Commission staff working document – Analysis of links between CAP reform and Green Deal*, SWD(2020) 93 final, Brussels.

¹⁶⁴ J. MCELLOWNEY-P. KELLY, *CAP strategic planning – Operational perspectives*, EPRS, European Parliament, 2019.

¹⁶⁵ M. GOLDONI, *Introduzione al convegno*, in *Riv. dir. agr.*, 1, 2020, p. 14.

¹⁶⁶ For a broad overview, see SWD(2021) 323 final, cit., p. 55 et seq.

2020 can help raise awareness of the benefits stemming from both sustainable soil management and the territorial development of rural economies¹⁶⁷.

5. *The way forward*

This contribution shows how a wide range of initiatives and legal tools have been designed to create and boost a common vision for sustainable land and soil use in Europe. The overall mission seeks to maintain 75% of EU soils in a healthy condition by 2030¹⁶⁸ through the adoption of innovation-driven agronomic approaches that protect natural resources, preserve soil health, encourage farm renewal, and build territorial cohesion. To this end, carbon farming and the proposal establishing a Union certification framework for carbon removal are leading the use of soil as a tool for climate policy. On the one hand, carbon farming is understood as a climate mitigation strategy that, by relying on a new green business model that rewards farmers to remove CO₂ from the atmosphere, contributes to the sustainability of the EU food supply chain¹⁶⁹. On the other hand, soil carbon removal schemes are fostered for the benefits they may bring to ecosystems and biodiversity, and for resilience and profitability they may give to farmers.

Although this perspective appears commendable at first sight, several issues remain unclear. As this analysis elucidated, the dichotomy of GHG emission reduction versus carbon sequestration lingers behind the proposed legislative framework, entailing a lack of clarity in legal definitions and specific goals. Moreover, voluntary carbon markets raise a spectrum of concerns that are difficult to solve. First, high uncertainty in soil carbon models and measurements correlates with a trade-off between accuracy and cost in estimating soil carbon sequestration¹⁷⁰. Second, the absence of details on issues relating to the permanence of storage and liability for reversal risks to create

¹⁶⁷ See Art 15, Reg 2021/2115.

¹⁶⁸ A. VOGLHUBER-SLAVINSKY ET AL., *Mission area - Soil health and food - Foresight on demand brief in support of the Horizon Europe mission board*, European Commission, Directorate-General for Research and Innovation, European Union, 2021.

¹⁶⁹ COM/2020/381 final, cit., p. 5.

¹⁷⁰ R. BELLAMY-S. OSAKA, *Unnatural climate solutions?*, in *Nat. Clim. Chang.*, 10, 2020, pp. 98-99; L. WALLER ET AL., *Contested framings of greenhouse gas removal and its feasibility*, in *WIREs Climate Change*, 11, 2020, doi: 10.1002/wcc.649.

legal gaps that can undermine, instead of achieving, long-term EU climate goals.

Third, weak transparency and oversight may lead to double claiming credits or double monetisation of sequestration efforts¹⁷¹. Fourth, the vagueness inherent in the Commission's legislation impedes the clarification of how it fits into EU policies dealing with nature-based removals and farming, such as the LULUCF Regulation¹⁷² and the CAP.

Regarding the CAP rules, two caveats warrant attention. Although they are also supported by their potential role in financing carbon farming and soil protection measures, they appear ineffective in addressing soil issues¹⁷³. As CAP architecture depends on national implementation choices, the absence of a level playing field among Member States negatively affects soil protection measures¹⁷⁴. In addition, no specific minimum amount (ringfencing) is requested for Member States towards climate or carbon farming schemes, given that ringfencing for eco-schemes in the EAGF and environmental payments in the EAFRD cover both environmental and climate spending.

¹⁷¹ SILVESTRUM CLIMATE ASSOCIATES-DUENE-GREIFSWALD MIRE CENTRE, *Future of the voluntary carbon markets in the light of the Paris Agreement - Perspectives for soil carbon projects*, German Emissions Trading Authority, 2018.

¹⁷² Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU [2018] OJ L 156/1. This Regulation aims at promoting nature-based solutions to mitigating GHG emissions and reducing the impact of land management and forestry practices on climate change. Under the related rules, Member States must account for their GHG emissions and removals attributed to natural and managed land. Recital 12 thereof correlates the LULUCF sector to the agricultural field, as it states that: «The LULUCF sector, including agricultural land, has a direct and significant impact on biodiversity and ecosystems services. For this reason, an important objective of policies affecting this sector is to ensure that there is coherence with the Union's biodiversity strategy objectives. Actions should be taken to implement and support activities in this sector relating to both mitigation and adaptation. Coherence between the Common Agricultural Policy and this Regulation should also be ensured. All sectors need to deliver their fair share as regards the reduction of greenhouse gas emissions». In 2023, Regulation (EU) 2023/839 (OJ L 107/1) amended the LULUCF Regulation as regards the scope, by simplifying the reporting and compliance rules and setting out the targets of the Member States for 2030. See J. LINSELOTTE, *Revision of the LULUCF Regulation: Strengthening the role of the land use, land-use change and forestry sector in climate action*, EPRS, European Parliament, 2023.

¹⁷³ M. WILLARD, *Can the CAP and carbon farming coexist?*, ARC2020 – CAP Strategic Plans, 2023, <<https://www.arc2020.eu/can-the-cap-and-carbon-farming-coexist/>> accessed 09 October 2023.

¹⁷⁴ J. AUGIER ET AL., *Evaluation study on the impact of the CAP on the sustainable management of soil*, Alliance Environment, 2021.

With this scenario in mind, the intricateness inherent in soil governance requires more decisive interventions to coherently address soil loss and degradation and to protect soil from climate change. However, as legislation relates to the ways in which knowledge, risk, and uncertainty are used and distributed, addressing the soil issue in terms of the market and, hence, reframing it as (also) an opportunity for business, constitutes a “technological fix” that is likely to remain ineffective as long as its explanation resides on a mere science-based and innovation-driven frame¹⁷⁵.

In this vein, the EEB suggested some key recommendations to maximise the benefits of action on soil matter¹⁷⁶. They involve the establishment of mandatory objectives on soil conservation and improvement of the ecological status of cultivated soil¹⁷⁷, ambitious and cross-cutting legally binding targets to improve the health of agricultural soils, common definitions for soil health and other soil-related issues, and mandatory monitoring systems to be implemented by the EU and national agencies.

Such a pathway, which should be based on the precautionary, pollution prevention at source, and do no harm principles, should be entrenched with public funding and private non-market-based financing for the mainstreaming of environment-specific soil management practices in farming. Still, it remains to be seen whether such a perspective can exert some influence on the priorities and goals of the EU policy agenda.

6. *Final thoughts*

In the EU Parliament’s 2023 Resolution on sustainable carbon cycles, interventions on carbon farming schemes and CAP strategic plans are called on to the Commission to strengthen the restoration of soil and deliver the required

¹⁷⁵ K. ROMMETVEIT-S. FUNTOWICZ-R. STRAND, *Knowledge, democracy and action in response to climate change*, in R. BHASKAR ET AL. (eds), *Interdisciplinarity and climate change. Transforming knowledge and practice for our global future*, London and New York, 2010, p. 160.

¹⁷⁶ C. NYSSSENS, *Carbon farming for climate, nature, and farmers. Policy recommendations*, EEB, 2021.

¹⁷⁷ *Halting and reversing soil degradation in Europe – A priority for the European Green Deal*, Consultation on Soil Thematic Strategy, Civil Society position paper, 2021, <https://mcusercontent.com/d128a627b717db2380ccf7e90/files/bed006bc-2d8d-407e-a07b-fe47ad148fb2/Soil_position_paper_21_04_21.pdf> accessed 18 March 2023.

holistic change¹⁷⁸. It is essential, though, that this shift is supported by harmonised and clear rules that cope with knowledge gaps and the side-effects of carbon removals. A well-defined legal framework shared by the Member States would allow the low-carbon transition to be seen not only as a commercial opportunity but also as a climate-related tool for more resilient EU agriculture¹⁷⁹. Furthermore, the prevention of erosion, improvement of soil structure, and reduction of the EU global footprint of soils should be pursued within a context in which soil science integrates more efficiently with agriculture, food security, global warming, and biodiversity. Binding targets should be established for Member States, so that coherence between the CAP and other policies translates into implementation and results¹⁸⁰. As the German Environment Agency succinctly argued, «the need to maintain and ensure soil ecosystem services throughout Europe is the strongest argument for soil protection rules at the EU level»¹⁸¹.

¹⁷⁸ European Parliament, *European Parliament resolution of 18 April 2023 on sustainable carbon cycles (2022/2053(INI))*, para. 21.

¹⁷⁹ European Economic and Social Committee, *Restoring sustainable carbon cycles*, Opinion, Rapporteur: A. Puech D'Alissac, NAT/846-EESC-2021, 2022, para. 1.6.

¹⁸⁰ T. STAINFORTH-C. BOWYER, *Climate and soil policy brief: Better integrating soil into EU climate policy*, IEEP/iSQAPER, 2020, p. 7.

¹⁸¹ H. GINZKY, *The need for soil protection legislation at EU level*, Position paper, German Environment Agency, 2018, p. 7.

ABSTRACT

Luca Leone – *A Renewed EU Soil Strategy for Climate-Smart Agriculture*

Against the social changes impacting on today's knowledge-informed agricultural practices, soil governance is gaining traction at the European (EU) level to tackle the negative effects of agricultural land use. Over the years, though, the fragmentary policy framework has failed to ensure an adequate level of protection for the soil functions. The EU Soil Strategy for 2030 represents the most recent attempt to reform and reinforce the legal pathway for soil health restoration. In this developing scenario, carbon farming and the CAP 2023-2027 are deemed key tools for a framework that combines voluntary and legislative action to guarantee more sustainable soil management practices. This contribution provides an overview of these normative developments and offers an outlook of their potential influence on EU agriculture, pending the legislative procedure for a comprehensive EU Soil Law.

KEYWORDS: *Soil law; Soil management practice; Common Agricultural Policy; Carbon farming; Carbon removal certification; climate-smart agriculture.*

Luca Leone – *Una rinnovata Strategia europea sul suolo per un'agricoltura "climaticamente" intelligente*

A fronte dei cambiamenti che interessano le odierne pratiche agricole basate sulla conoscenza, una strategia di governance del suolo è andata maturando nello scacchiere europeo (UE) come risposta ai problemi derivanti dallo sfruttamento dei terreni agricoli. Nel corso degli anni, tuttavia, il quadro di policy frammentario in materia non ha garantito un livello adeguato di protezione del suolo. La Strategia dell'UE per il suolo per il 2030 rappresenta il tentativo più recente di riformare e rafforzare il percorso giuridico per il ripristino della salute del suolo. In questo scenario in evoluzione, il carbon farming e la PAC 2023-2027 emergono come strumenti chiave per un quadro che combina misure facoltative e giuridicamente vincolanti volte a garantire pratiche di gestione del suolo più sostenibili. Il presente contributo delinea i

contorni di questi sviluppi normativi e si interroga sui potenziali benefici che si prospettano per l'agricoltura dell'UE, in attesa dell'adozione della direttiva europea sul monitoraggio del suolo.

PAROLE-CHIAVE: *Legge sul suolo; Pratiche di gestione dei suoli; Politica Agricola Comune; Carbon Farming; Certificazione per gli assorbimenti di carbonio; Agricoltura intelligente per il clima.*