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Building a legal framework for a soil carbon bank in Slovakia: Policy assessment and recommendations within the EU legal and policy context***

Summary

Soil is Europe's largest terrestrial carbon reservoir, essential for climate neutrality, biodiversity, and food security. Yet, it remains the only major natural resource in the European Union without a binding legal framework. The EU Soil Strategy for 2030 and related Green Deal policies offer a vision for reversing soil degradation and boosting carbon sequestration, but legal and policy gaps persist at both EU and national levels. This article assesses the EU's evolving framework, including the proposed Soil Health Law and the Carbon Removal Certification Framework. It also evaluates Slovakia's national response, focusing on the 2025 amendment to the Agricultural Land Act and the failed proposal for a Climate Soil Fund. Despite these efforts, Slovakia lacks clear legal mandates, financial incentives, and coordinated policies to fully support soil-based

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climate action. The main contribution of this article lies in identifying how the absence of an integrated legal and financial framework in Slovakia undermines the practical implementation of soil carbon sequestration measures. The greatest challenge highlighted is the political and institutional inertia that prevents Slovakia from translating EU soil policy ambitions into enforceable national legislation and operational support for land managers.

The article recommends adopting a comprehensive Soil Protection Act, establishing financial incentives for carbon farming, improving soil monitoring, and strengthening policy integration across sectors. These steps are vital for unlocking soil's climate potential and aligning Slovakia with EU climate and biodiversity targets.

Keywords: Soil protection, carbon sequestration, EU Soil Strategy for 2030, carbon farming, climate neutrality, carbon banking

1. Introduction

1.1. Addressing the gaps

Soil is increasingly recognised as one of the most strategic natural resources in addressing the climate and biodiversity crises. As the largest terrestrial carbon reservoir in the European Union, storing an estimated 75 billion tonnes of carbon,[1] soil plays a critical role in supporting ecosystem services, food production, water retention, and climate mitigation. However, soil remains the only major natural resource in the EU without a comprehensive binding legal framework for its protection.[2] In response to this governance gap, the European Green Deal and its Soil Strategy for 2030 have identified healthy soils as a prerequisite for achieving climate neutrality, food security, and biodiversity restoration by mid-century. From a legal perspective, soil protection falls under the European Union's shared competence in the field of environment, as defined in Article 4(2)(e) of the Treaty on the Functioning of the European Union. This means that both the EU and its Member States may legislate, but Member States may only exercise their competence to the extent that the EU has not adopted binding legal acts. The legal nature of soil has also evolved, from being traditionally viewed as a productive resource or commodity to being increasingly recognised as an environmental asset whose degradation affects biodiversity, climate, and public health.[3]

[1] P. Panagos, *A 1 billion euro mission: A Soil Deal for Europe*, "European Journal of Soil Science" January–February 2024, vol. 75, no. 1, p. 2, https://doi.org/10.1111/ejss.13466.

[2] European Commission, *Soil Strategy for 2030 – Reaping the benefits of healthy soils for people, food, nature and climate* (Communication) COM/2021/699 final, p. 4 (hereinafter: *Soil Strategy for 2030*).

[3] I. Heuser, *Soil Governance in current European Union Law and in the European Green Deal*, "Soil Security" 2022, vol. 6, 100053, https://doi.org/10.1016/j.soisec.2022.100053.

At the same time, recent legal analyses highlight that soil quality is not only an environmental challenge, but also a public health and food security issue, requiring cross-sectoral legal and policy responses.[4] The development of carbon farming certification schemes and soil carbon banks is seen as a promising market-based approach to mobilise private investment in soil restoration. However, the proposed EU Carbon Removal Certification Framework has been criticised for failing to adequately distinguish between temporary and permanent carbon storage, raising concerns about the environmental integrity of voluntary carbon markets.

While these developments set a promising agenda at the European level, Slovakia's national response remains fragmented and underdeveloped. Although the forestry sector has made measurable progress in long-term carbon retention through sustainable forest management and afforestation schemes, similar strategic focus is lacking in agricultural landscapes. Slovakia's National Energy and Climate Plan (NECP) shows limited recognition of soil-based carbon sequestration, and the failure to adopt a Climate Soil Fund illustrates persistent institutional and political barriers.

This article aims to critically assess the EU and Slovak legal and policy frameworks on soil protection and carbon sequestration. It identifies implementation gaps and proposes recommendations for improving governance, financial incentives, and cross-sectoral integration to strengthen soil-based climate action in Slovakia.

1.2. Key terms and concepts

As this article discusses the legal and policy framework for enhancing soil-based carbon sequestration in the EU and Slovakia, it is useful to briefly clarify the main terms that appear throughout the text.

Carbon farming represents a land management model in which landowners adopt practices that remove carbon from the atmosphere and store it in soil or biomass. These practices, for example agroforestry, cover cropping, and reduced tillage, are rewarded as part of a climate mitigation strategy. In EU documents, carbon farming is described as a green business model designed to incentivise farmers for delivering measurable carbon removals.[5]

Soil carbon bank is a proposed mechanism through which verified carbon stored in soil can be registered, monitored, and potentially rewarded. Though

[4] L. Palšová, Z. Bohátová, J. Lazíková, *Quality Soil as a Pathway to Healthy Food in the EU – Project Information*, "EU Agrarian Law" 2021, vol. X, no. 2, p. 28.

[5] European Commission, *Sustainable Carbon Cycles* (Communication) COM/2021/800 final, p. 4.

not yet operational in Slovakia, this concept is gaining traction in EU climate discussions, especially concerning upcoming certification schemes.[6]

Soil health refers to the condition of soil in terms of its biological activity, chemical balance, and physical structure. According to the EU Soil Strategy for 2030, healthy soils are those that maintain their ability to deliver ecosystem services such as food production, climate regulation, and biodiversity support.[7]

1.3. Approach and methodology

This article adopts a normative and analytical approach to assessing the legal and policy framework for soil protection and carbon sequestration in Slovakia, with reference to relevant developments at the EU level. The analysis is structured around three core dimensions: (1) the strategic objectives and instruments developed by the European Union; (2) the legal and institutional framework in Slovakia; and (3) the gaps, challenges, and proposals for reform.

Primary sources include binding and non-binding EU documents (such as the EU Soil Strategy for 2030, the Common Agricultural Policy Strategic Plan, and relevant legislative proposals), Slovak national legislation (e.g., Act on the Protection and Use of Agricultural Land), policy strategies, and official government reports. These were complemented by academic literature and expert commentary, including selected contributions from recent Slovak legal scholarship.

The working hypothesis is that, despite recent legislative efforts, Slovakia's current framework remains insufficiently aligned with the EU's ambitions in the area of climate-smart soil governance. In particular, the article argues that without stronger institutional support, financial instruments, and integration of carbon farming principles, Slovakia risks lagging behind in implementing land-based climate solutions.

2. EU legal and policy framework on soil and carbon sequestration

2.1. Preliminary remarks

Soil plays a critical role in achieving the EU's long-term climate and environmental objectives. Despite the vast size of the soil carbon pool, soil degradation

[6] T. Longbottom et al., *What's Soil Got to Do with Climate Change?*, "GSA Today" 2022, vol. 32, no. 5, pp. 4–10, https://doi.org/10.1130/GSATG519A.1.

[7] *Soil Strategy for 2030*, p. 4.

has led to the loss of significant amounts of naturally stored soil carbon. It was concluded that "the carbon sink capacity of the world's agricultural and degraded soil is 50 to 66% of the historic loss of 42 to 78 gigatonnes of carbon."[8] Acknowledging this problem, while also viewing it as an opportunity, the European Union began incorporating soil protection and carbon sequestration into its broader environmental and climate policy framework, most notably through the European Green Deal and associated strategies such as the EU Soil Strategy for 2030, the Biodiversity Strategy for 2030, the Farm to Fork Strategy, and the "Fit for 55" package.

Despite these efforts, soil remains the only major natural resource in the EU without a dedicated, binding legal framework. The ongoing degradation of soil, loss of organic matter, and limited recognition of soil as a climate asset continue to undermine the Union's capacity to achieve its climate neutrality targets by 2050. The European Commission acknowledges this gap and, through the EU Soil Strategy for 2030, has committed to introducing a new legislative proposal, namely, the Soil Health Law, which is aimed at ensuring that all soils in the EU are healthy by 2050.

One of the innovative mechanisms discussed in both EU and national policy debates is the concept of **soil carbon bank**. This instrument is designed to incentivise landowners and land managers for verified increases in soil organic carbon, thereby turning carbon sequestration into an economically viable and environmentally beneficial practice. Such a mechanism has been referenced in the Farm to Fork Strategy, where the establishment of regulatory systems to certify carbon removals, including through soil management, is proposed.

This section of the article presents an organised overview of the EU legal and policy tools pertaining to soil protection and carbon sequestration. It starts by examining the objectives and legal nature of the EU Soil Strategy for 2030. It then looks at how this interlinks with other major policy initiatives across climate, biodiversity, circular economy, and agriculture policies. The last part examines the advantages and drawbacks and future aspirations at the EU level and prepares the ground for the following analysis of the Slovak legal and policy framework.

2.2. The EU Soil Strategy for 2030

Soil is an integrated part of natural capital, but it is also finite and not renewable within the span of multiple human lifetimes and we can state that it is still the most neglected part of natural capital in Europe. Acknowledging this

[8] R. Lal, *Soil Carbon Sequestration Impacts on Global Climate Change and Food Security*, "Science" 2004, vol. 304, p. 1623.

paradox, the European Commission adopted the EU Soil Strategy for 2030 as part of the European Green Deal. This strategic document provides long-term vision and policy direction for reversing soil degradation and achieving healthy soils across the European Union by 2050. The Strategy frames soil not only as a key environmental resource but also as a climate asset with the potential to contribute significantly to climate neutrality through enhanced carbon sequestration. Carbon sequestration can be described as a tool designed to help address climate change challenges (both as a mitigation and adaptation measure) while simultaneously supporting food production for a continuously growing population.[9] In doing so, it highlights the dual role of soil in supporting biodiversity and regulating climate, acknowledging that soil organic carbon is the single largest terrestrial carbon pool.[10]

Among its headline commitments, the Strategy announces the preparation of a Soil Health Law by 2023. This legislative proposal is expected to establish legally binding obligations for Member States to protect and restore soil health, filling a longstanding gap in EU environmental law.[11] The absence of binding soil protection legislation has been previously criticised by both the European Parliament[12] and the European Court of Auditors,[13] who have repeatedly called for stronger legal measures to halt soil degradation. The Strategy also outlines several key objectives, including:

– preventing further soil degradation and restoring degraded soils,
– increasing soil organic carbon levels across agricultural and forested lands,
– enhancing soil monitoring and data collection to support evidence-based policymaking,
– promoting sustainable soil management practices, such as reduced tillage, cover cropping, agroforestry, and organic farming.[14]

Importantly, the Strategy recognises the economic and social dimensions of **soil health**, stating that healthy soils are essential for food security, human health, and rural livelihoods. It also promotes the development of market-based mechanisms, such as **carbon farming** and **soil carbon banking**, to reward

[9] Š. Jakl, *Ochrana půdy z hlediska obsahu organické hmoty*, in: *Půda v právních vztazích: aktuální otázky*, Spisy Právnické fakulty Masarykovy univerzity, řada teoretická, Edice Scientia [online], (eds.) J. Tkáčiková, V. Vomáčka, D. Židek et al., Masarykova univerzita, Brno 2020, p. 236. Available only in the Czech language.

[10] *Soil Strategy for 2030*, p. 1.

[11] Ibidem.

[12] European Parliament, *Resolution of 28 April 2021 on Soil Protection* (Resolution) 2021/2548(RSP) (webpage), https://www.europarl.europa.eu/doceo/document/TA-9-2021-0143_EN.html [accessed 29 April 2025].

[13] European Court of Auditors, *EU efforts for sustainable soil management. Unambitious standards and limited targeting* (Special Report No 19/2023), p. 11 (webpage), https://www.eca.europa.eu/ECAPublications/SR-2023-19/SR-2023-19_EN.pdf [accessed 29 April 2025].

[14] *Soil Strategy for 2030*, pp. 6–22.

landowners for verified improvements in soil health and carbon sequestration.[15] This concept is directly linked to the Farm to Fork Strategy's call to develop a regulatory framework for the certification of carbon removals, including those achieved through soil management.[16] While the EU Soil Strategy for 2030 sets a strong political vision, it remains non-binding until formal legislation is adopted. Until the proposed Soil Health Law enters into force, the Strategy depends on voluntary action by Member States through instruments such as their Common Agricultural Policy (CAP) Strategic Plans 2023–2027.[17]

In summary, the EU Soil Strategy for 2030 represents a paradigm shift in soil governance. By positioning soil as both a biodiversity and climate asset, it prepares the ground for integrating soil health into European environmental and climate law. However, the success of this vision will largely depend on the forthcoming Soil Health Law and on the capacity of Member States to mobilise legal, financial, and technical tools to achieve the Strategy's ambitious objectives.

While the EU Soil Strategy for 2030 provides a central political vision to reverse soil degradation and promote carbon sequestration, it does not stand alone. As L. Leone notes, "soil-based functions are at the crossroads of the global challenges posed by climate change, environmental degradation, food security, and biodiversity loss."[18] These challenges are addressed not only through soil-specific policies, but also through a broader web of interrelated EU strategies targeting climate neutrality, biodiversity restoration, sustainable food systems, and circular economy transitions. The following section therefore examines how these complementary policy frameworks, ranging from climate and biodiversity strategies to agricultural and circular economy policies, collectively support or, in some cases, limit the implementation of the Soil Strategy's ambitions.

2.3. Related EU policies and strategies

2.3.1. Preliminary remarks

In addition to the EU Soil Strategy for 2030, several other strategic policy documents adopted under the European Green Deal provide complementary

[15] *Soil Strategy for 2030*, pp. 2–8.

[16] European Commission, *A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system* (Communication) COM/2020/381 (hereinafter: *Farm to Fork Strategy*).

[17] European Commission, *Summary of CAP Strategic Plans for 2023-2027: joint effort and collective ambition* (Report) COM/2023/707 final, p. 1 (hereinafter: *CAP Strategic Plans Report*).

[18] L. Leone, *A Renewed EU Soil Strategy for Climate-Smart Agriculture*, "Rivista Quadrimestrale di Diritto dell'Ambiente" 2023, no. 2, pp. 75–108.

frameworks for advancing soil protection and carbon sequestration objectives. These policies reflect the EU's integrated approach to environmental sustainability, climate neutrality, food security, and circular economy development.

The policies discussed in this section are chosen, either for their direct or systemic impact on soil functions such as carbon sequestration, biodiversity and sustainable land use, or for their role in managing of pollution. The sequence follows a thematic logic and starting with the overarching European Green Deal, progressing to the "Fit for 55" package as the climate legislative backbone, and continuing through sector-specific strategies (Farm to Fork, Biodiversity, Circular Economy, Forests, and Chemicals). This structure enables a gradual shift from broad climate and sustainability goals to targeted policy instruments that influence soil management practices. This section provides an overview of these key EU-level strategies, setting the stage for a critical assessment of how they collectively support soil-related climate action.

2.3.2. The European Green Deal[19]

The European Green Deal (EGD), adopted in 2019, sets the European Union's overarching strategy to achieve climate neutrality by 2050, transforming the economy while protecting the EU's natural capital, including soil. The EGD represents a systemic shift in EU environmental governance, framing soil not merely as a productive resource but as a multifunctional environmental asset central to climate and biodiversity policies.[20] Despite the fact that soil health is not explicitly named as a standalone priority, the EGD highlights the need for bold and comprehensive policies that maximise benefits for climate, biodiversity, pollution reduction, and sustainable food systems.[21]

Sustainable soil management is acknowledged to be a key element that can help solve major challenges in agriculture, biodiversity and pollution control, as defined by the European Green Deal. It calls for the development of the Farm to Fork Strategy, which includes measures to promote carbon farming and improve nutrient management. It also announces the Zero Pollution Action Plan, which explicitly targets soil pollution prevention and remediation, and the Biodiversity Strategy for 2030, which aims to restore carbon-rich ecosystems such as peatlands and soils. While the EGD sets the political direction, it delegates the development of concrete soil-related instruments, such as the EU

[19] European Commission, *The European Green Deal* (Communication) COM/2019/640 final (hereinafter: *The European Green Deal*).

[20] L. Montanarella, P. Panagos, *The relevance of sustainable soil management within the European Green Deal: A review*, "Land Use Policy" 2021, vol. 100, 104950, https://doi.org/10.1016/j.landusepol.2020.104950b.

[21] *The European Green Deal*, p. 3.

Soil Strategy for 2030 and future carbon farming certification frameworks, to subsequent strategies and legislative proposals. These follow-up initiatives aim to operationalise the EGD's ambition by turning soil into a recognised climate asset through legal and market-based instruments, including the concept of a soil carbon bank. In this way, the European Green Deal provides the foundational political mandate for integrating soil protection and carbon sequestration into the EU's broader climate and environmental policy framework.

2.3.3. The "Fit for 55" package and the LULUCF Regulation

The "Fit for 55" package, adopted in 2021, translates the EGD's climate ambition into binding legislative proposals. Central to this package is the revision of the 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.[22] Member States are required to ensure that land use activities contribute to achieving net greenhouse gas removals of 310 million tonnes of CO_2 equivalent as a sum of the values of the greenhouse gas net emissions and removals,[23] established by this regulation. This target implicitly relies on improving soil carbon stocks, particularly in agricultural and forested landscapes.

2.3.4. Farm to Fork Strategy[24]

The Farm to Fork Strategy, introduced in 2020 as part of the European Green Deal, seeks to transform Europe's food system to be fairer, healthier and more environmentally conscious. It is tackling a series of environmental and social challenges, from climate change, biodiversity loss and soil degradation, to pollution and food security. The strategy is comprehensive and addresses the entire food production and consumption path, however, it is also concerned with soil protection and carbon storage as expressed in a number of key measures. For a start, the plan encourages the implementation of agroecological and regenerative agricultural practices, such as agroforestry, organic

[22] European Commission, *"Fit for 55": delivering the EU's 2030 Climate Target on the way to climate neutrality* (Communication) COM/2021/550 final.

[23] Article 4 para. 2 of the 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.

[24] *Farm to Fork Strategy.*

farming and reduced tillage, which help increase soil organic carbon levels and boost soil health.[25]

A central element of the Farm to Fork Strategy is the development of a regulatory framework for the certification of carbon removals, which includes carbon farming as a recognised practice. This certification programme, announced in 2021, aims to deliver legal certainty and market acceptance for land-based carbon removal options, including soil carbon storage. In so doing, it paves the way for the development of financial incentives and market-based tools, like **soil carbon banks**, which compensate farmers and land managers for scientifically proven climate mitigation actions. As well as supporting climate objectives, the strategy also sets challenging targets for reducing the use of chemical pesticides, fertilisers and antibiotics – three of the biggest environmentally harmful impacts in agricultural soil and water. The strategy is designed to advance soil quality and ecosystem services whilst promoting nutrient management, precision agriculture, and sustainable land use practices. Yet the effectiveness of these measures heavily relies on the integration of Farm to Fork objectives into national agricultural policies, notably the Member States' new CAP Strategic Plans for the period 2023–2027. This strategy calls on Member States to align their CAP plans with the European Green Deal, ensuring farm payments provide incentives to farmers to use sustainable practices, including those that enhance soil carbon sequestration.[26]

In essence, the Farm to Fork Strategy regards soil health and carbon sequestration as fundamental pieces of a much larger transition towards sustainable food systems in the EU. By combining agricultural practices with climate, environmental and health objectives, it offers both regulatory guidance and market opportunities to incentivise soil's contribution to the EU's drive to climate neutrality and sustainability. This multidimensional linkage is also enhanced by legal arguments which stress that degradation of soil is not only a concern of the environment, but also a prerequisite for safe food and the protection of public health.[27]

2.3.5. The EU Biodiversity Strategy for 2030[28]

The new EU Biodiversity Strategy for 2030, established in the framework of the European Green Deal, draws an ambitious path for the restoration of Europe's biodiversity and the resilience building of ecosystems, which include soils. Rec-

[25] Ibidem, p. 9.

[26] Ibidem.

[27] L. Palšová, Z. Bohátová, J. Lazíková, *Quality Soil...*, pp. 28–29.

[28] European Commission, *EU Biodiversity Strategy for 2030 Bringing nature back into our lives* (Communication) COM/2020/380 final.

ognising biodiversity loss as one of the main causes of environmental degradation and climate instability, the strategy aims to manage Europe's land and sea areas sustainably and restore them as required.

One of the strategy's headline commitments is to protect at least 30% of the EU's land area and 30% of its sea by 2030, with 10% strictly protected, specifically in areas of high biodiversity and carbon technology, including peatlands, wetlands, grasslands and forest soils.[29]

The recovery of carbon-rich ecosystems, such as degraded land, is explicitly highlighted as a priority action for both biodiversity and climate mitigation. The plan sets out the need for 2021 to see legally binding targets for EU nature restoration, based on a set of principles that place emphasis on restoring damaged ecosystems, enhancing soil quality and raising levels of soil organic carbon. These are aimed at helping to sequester carbon, prevent floods and water pollution, retain soil fertility and support the resilience of ecosystems. Biodiversity Strategy In the area of agriculture, the Biodiversity Strategy contributes to the objectives of the Farm to Fork Strategy through the promotion of agroecological practices, diversified crop systems and organic farming. It also points to the necessity of minimising soil pollution with pesticides and artificial fertilisers, further emphasising the relationship between soil health and biodiversity conservation.[30]

Importantly, the plan positions nature-based solutions, which can become key tools to vanguard climate adaptation and mitigation through soil management practices and increasing biodiversity and carbon storage. These priorities are directly echoed in scientific literature, which recognises the Biodiversity Strategy's emphasis on nature-based solutions for climate mitigation, soil protection, and ecosystem restoration. Scholars have noted that restoring carbon-rich ecosystems such as peatlands and soils is central to achieving both biodiversity and climate goals, and that effective implementation relies on cross-sectoral alignment and national integration.[31] By integrating ecosystem restoration into climate policy, the Biodiversity Strategy underlines the multifunctional role of soils as providers of biodiversity, climate regulation, and ecosystem services. Yet like other EGD strategies, the success of the Biodiversity Strategy is in large measure dependent on national action and cross-sectoral synergy, through the CAP Strategic Plans (and the national biodiversity strategies). Member States are called upon to translate EU-wide objectives into effective national instruments

[29] Ibidem, p. 4.

[30] Ibidem, p. 5.

[31] V. Hermoso, A. S. Morán-Ordóñez, S. Canessa, L. Brotons, *Integrating biodiversity, climate, and water policy: The EU Biodiversity Strategy for 2030*, "Environmental Science & Policy" 2022, vol. 132, pp. 75–83, https://doi.org/10.1016/j.envsci.2022.02.024.

that mainstream soil restoration and protection in national environmental, agricultural and climate policies.[32]

In conclusion, the EU Biodiversity Strategy for 2030 puts in place soil as a key component in the EU nature and climate agenda setting the legal and policy ground to integrate biodiversity conservation with carbon sequestration in agricultural and natural areas.

2.3.6. The Circular Economy Action Plan[33]

The Circular Economy Action Plan (CEAP), adopted in March 2020, is a cornerstone of the sustainability and resource-efficiency agenda of the European Green Deal. Though the CEAP is primarily targeted at waste reduction and material-closure in industrial and consumption systems, its indirect impacts related to soil health and carbon storage are heavy.[34] The CEAP aims at the sustainable management of bio-based resources, such as biomass, compost and other organic waste, that are also crucial materials for the improvement of soil fertility and soil organic carbon content. Through the promotion of circular bioeconomy systems, the CEAP also seeks to support the development of circular bioeconomy models, valorising organic waste streams (food waste, green waste) into soil amendments, compost and bio-based products, which can help to restore soil health.

Furthermore, the CEAP emphasises the importance of sustainable agriculture and forestry with regard to local nutrient and carbon cycles. It appeals for greater sustainability and circularity in nutrient management, including recovery and re-use of nutrients from organic waste to fight soil deterioration due to over-fertilisation. The CEAP does not mention carbon farming or soil carbon markets explicitly it provides a supportive policy context for the development of soil-related circular value chains. The use of composted bio-waste or the promotion of products that are good for soil health also fit in well with larger climate and environmental goals, such as carbon sequestration.[35]

The CEAP also aligns very well with the objectives of the Farm to Fork Strategy, in favour of sustainable food production and consumption, including the reduction of food waste throughout the supply chain. In addition to relieving the environmental stresses, the reduction of food waste also aids in more effective

[32] Ibidem, p. 6.

[33] European Commission, *A new Circular Economy Action Plan. For a cleaner and more competitive Europe* (Communication) COM/2020/98 final, pp. 9–10.

[34] See J. Vodička, *Advancing Circular Economy: Czech perspective*, "Journal of Agricultural and Environmental Law" 2024, vol. 36, no. 19, pp. 224–248, https://doi.org/10.21029/JAEL.2024.36.255.

[35] Ibidem, p. 16.

land and soil management. Overall, although the Circular Economy Action Plan is not intended to concentrate on soil governance, it indirectly addresses soil health and carbon sequestration through the promotion of circular bioeconomy practices, nutrient recycling and valorisation of organic waste that contribute to all aspects of sustainable land management and climate mitigation.

2.3.7. The EU Forest Strategy for 2030[36]

The EU Forest Strategy for 2030, which was adopted in the European Green Deal framework, will contribute to maximising the contribution of forests and the forest-based sector to the three key EU targets, namely: to reach **climate neutrality**, protect **biodiversity and its resources**, and **support rural development**. Recognising that forest ecosystems play key roles for carbon sequestration, soil protection and water regulation, the strategy identifies sustainable forest management as an essential tool for the EU's environmental and climate policies. An important aim of the strategy is to enhance the quality and quantity of forest carbon sinks, including forest-soil carbon. Forest soils are one of the largest carbon pools in Europe on a long-term scale, and sustainable forest management practices (e.g., agroforestry, mixed-suppress plantations and natural regeneration) are key measures to sustain and even increase carbon stocks in forest soils.[37]

This strategy, *inter alia*, emphasises the importance and need to rehabilitate degraded forest soils, increase soil fertility, and build resilience within forest ecosystems to the impacts of climate change, including drought, pest outbreaks, and wildfire. It specifically advocates nature-based solutions to restore forest health through practices that conserve soil and with it soil structure, organic matter and nutrient cycling. In addition, the strategy supports the incorporation of agroforestry systems within agricultural landscapes, acknowledging their twofold contribution to biodiversity and climate mitigation by sequestering carbon within soils.

Agroforestry not only enhances carbon storage in both biomass and soils, but also promotes soil structure, water retention and ecosystem resistance. It also connects forest management with rural development and the bioeconomy, promoting the use of sustainably sourced biomass and protecting soil health and biodiversity. It does caution that there should not be over-extraction of forest resources and an overall need for carbon harvesting and storage to be balanced with ecosystem restoration and conservation goals.[38]

[36] European Commission, *New EU Forest Strategy for 2030* (Communication) COM/2021/572 final.

[37] Ibidem, p. 15.

[38] Ibidem, p. 18.

In summary, the EU Forest Strategy for 2030 reinforces the role of forest soils as critical carbon sinks and ecosystem service providers, promoting integrated management approaches that enhance soil health, carbon sequestration, and climate resilience across Europe's forested landscapes.

2.3.8. The Chemicals Strategy for Sustainability[39]

The Chemicals Strategy for Sustainability, adopted in 2020 as part of the European Green Deal's Zero Pollution ambition, aims to achieve a goal "to protect better human health and the environment as part of an ambitious approach to tackle pollution from all sources and move towards a toxic-free environment."[40] Despite the fact that it is primarily focused on air, water and consumer product safety, the plan also takes on soil pollution, calling for an essential reckoning with a pervasive concern of environmental and human health. The strategy focuses on limiting toxic substances such as pesticides and fertilisers that damage soil, as well as the impacts of industry emissions and waste, all of which pollute soil, as well as biodiversity and the ability of the environment to function, including carbon sequestration.

Contaminated soils lose their capacity to function as carbon sinks and their role in mitigating climate change is limited. To address these risks, the Chemicals Strategy for Sustainability proposes:

– stronger legal restrictions on harmful substances, including persistent, bioaccumulative, and toxic chemicals;
– improved soil monitoring and risk assessment frameworks;
– enhanced enforcement of existing EU legislation on soil pollution prevention and remediation.[41]

The strategy also includes safer and sustainable chemical alternatives that could lessen the chemical pressure on soils to support sustainable agricultural systems, such as organic farming and integrated pest management. While this approach does not directly address the sequestration of carbon in soils, without which the continued function of soils and our capacity to restore their health are necessary conditions for the storage of carbon in soils over time. Prevention and remediation of soil contamination reinforces soil's potential and ability to contribute to climate and biodiversity objectives.[42]

In summary, the Chemicals Strategy for Sustainability provides an important regulatory and policy framework for tackling soil pollution, safeguarding

[39] European Commission, *Chemicals Strategy for Sustainability Towards a Toxic-Free Environment* (Communication) COM/2020/667 final.

[40] Ibidem, p. 1.

[41] Ibidem, p. 10.

[42] Ibidem, p. 5.

soil health, and supporting the role of soils as carbon sinks within the broader climate and environmental agenda of the European Union.

2.4. Other relevant EU policies supporting soil protection and carbon sequestration

In addition to the core strategies of the European Green Deal, several other EU policy documents positively reinforce soil protection and carbon sequestration. These policies complement the Union's climate and biodiversity ambitions by addressing soil pollution, climate resilience, agricultural funding, research and innovation, and bioeconomy development. Even if not always centred specifically on the soil, they in different ways help to enhance soil health as well as climate functions related to soil.

2.4.1. Zero Pollution Action Plan for Air, Water and Soil[43]

Adopted as part of the European Green Deal's Zero Pollution ambition, this action plan explicitly identifies soil pollution as a priority within environmental and health matters. By promoting cleaner production processes and better waste management, the plan supports the restoration of healthy soils as part of the broader environmental policy framework, while urgently working towards a framework to regularly assess the status of EU soils and take action at all levels to address soil pollution and degradation. The plan contributes to healthy soil restoration by encouraging cleaner production processes and improved waste management, "while urgently working towards a framework to regularly assess the status of EU soils and take action at all levels to address soil pollution and degradation."[44]

2.4.2. EU Strategy on Climate Change Adaptation[45]

This new adaptation strategy of the EU adopted in 2021 emphasises the need to enhance soil resilience to climate change and its related impacts, like drought,

[43] European Commission, *Pathway to a Healthy Planet for All EU Action Plan: "Towards Zero Pollution for Air, Water and Soil"* (Communication) COM/2021/400 final.

[44] Ibidem, p. 8.

[45] European Commission, *Forging a climate-resilient Europe – the new EU Strategy on Adaptation to Climate Change* (Communication) COM/2021/82 final.

flood, land degradation. It highlights nature-based solutions and sustainable land management as important practices to improve the adaptation capacity of natural and agricultural ecosystems. The Commission will also propose nature-based solutions for carbon removals, including accounting and certification in upcoming carbon farming initiatives, thereby linking adaptation goals with the EU's broader climate mitigation strategy.[46]

2.4.3. Common Agricultural Policy for 2023–2027[47]

As the EU's primary financial and regulatory framework for agriculture, the Common Agricultural Policy **(**CAP) plays a fundamental role in influencing land uses and soil management. The CAP Strategic Plans for 2023–2027 require Member States to set environmental and climate targets, including those related to soil protection, carbon sequestration, and sustainable land management. Eco-schemes and agri-environmental measures give farmers an optional way to receive payments for doing soil-friendly activities such as practices for carbon sequestration and storage in soil and in biomass through a mix of conditionality.[48]

2.4.4. EU Soil Mission – A Soil Deal for Europe[49]

The EU Mission "A Soil Deal for Europe" represents a dedicated research and innovation programme aiming to achieve healthy soils by 2030. It prioritises enhanced soil literacy, the design of soil monitoring systems and will showcase best practice in soil management via Living Labs and Lighthouse Projects. "It will contribute to Green Deal targets relating to sustainable farming, climate resilience, biodiversity and zero-pollution."[50]

2.4.5. EU Bioeconomy Strategy[51]

The Bioeconomy Strategy supports the sustainable use of biomass and conversion of biogenic waste into valuable resources in the circular economy. The approach promotes the recycling of nutrients and the creation of soil amendments

[46] Ibidem, p. 12.
[47] *CAP Strategic Plans Report.*
[48] Ibidem, p. 6
[49] European Commission, *On European Missions* (Communication) COM/2021/609 final.
[50] Ibidem, p. 4.
[51] European Commission, *A Sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment* (Communication) COM/2018/673 final.

from bio-based materials to foster soil fertility improvement and carbon sequestration. It also draws attention to the contribution of the bio-based industries sector to offer nature-positive solutions to agriculture and forestry.

Tangible measures to implement the Strategic Deployment Agenda will demonstrate the broad potential of the bioeconomy for rural, coastal and urban communities. Pilot actions will be developed, improving the synergy levels of already existing instruments of the EU in order to give support to local actions and in order to draw attention to the bioeconomy in a more explicit way. Five pilot activities will be developed in phase one. Amongst these, the pilot on **carbon farming** will prompt Member States to set up a fund to purchase carbon credits from farmers and forest owners that carry out specific projects designed to increase carbon sequestration in soil and biomass or reduce emissions from livestock and from the application of fertilisers.[52]

2.4.6. Integrative perspective and link to carbon banking

Taken together, these sectoral strategies constitute a complex and partially overlapping policy framework that influences how soil is managed and protected across the EU. While each instrument operates within its own thematic domain (e.g. agriculture, biodiversity, forestry, climate, pollution control) they collectively contribute to shaping the legal and institutional conditions for soil-related interventions. Importantly, none of these policies directly regulates soil carbon markets or carbon farming. However, several of them, most notably the CAP, the Biodiversity Strategy, and the EU Soil Strategy, provide key legal, financial, and operational entry points for the future development of soil carbon banking schemes. As such, any national or EU-wide system aiming to reward soil-based carbon sequestration must be conceived in harmony with this existing policy architecture and the broader goals of the European Green Deal.

2.5. Identified gaps and ambitions at the EU level

Despite the growing political recognition of soil as a vital environmental and climate asset, the European Union's legal and policy framework for soil protection and carbon sequestration remains fragmented and insufficiently enforced. The EU Soil Strategy for 2030 openly acknowledges this deficiency, noting that soil is the only major natural resource in the EU without comprehensive and binding legal protection.[53] This legal gap undermines the Union's ability to

[52] Ibidem, p. 9.

[53] *Soil Strategy for 2030.*

coordinate actions across Member States and to ensure consistent enforcement of soil protection measures.

The absence of a legally binding Soil Health Law leaves soil governance dependent on fragmented sectoral policies, such as the CAP, the Water Framework Directive, and the Waste Framework Directive. These instruments, while important, do not offer an integrated approach to managing soil health as a multifunctional resource.[54] The rejection of the 2006 Soil Framework Directive[55] proposal has left soil protection largely to the discretion of national governments, resulting in inconsistent levels of ambition and action across the EU. Although the 2006 proposal did not explicitly mention carbon sequestration or market-based instruments such as soil carbon banking, it laid important groundwork by seeking to establish a coherent monitoring system and obliging Member States to adopt national soil protection programmes. These structural obligations would have created legal preconditions for recognising soil as a carbon sink and for developing soil quality indicators relevant to climate targets. In this sense, the draft Directive anticipated many of the elements that now underpin the legal feasibility of soil carbon certification schemes.[56]

One of the main barriers identified by the European Commission, as regards to soil monitoring, is the existing absence of harmonised monitoring systems and comparable data in the Member States. Europe's soils require reliable data on which to base assessments of the health of Europe's soils, progress towards soil health objectives and successful policy responses. The establishment of the EU Soil Observatory (EUSO) is a step forward, but its success depends on the willingness and capacity of Member States to implement national soil monitoring systems and share data.[57] This monitoring gap has been partially addressed by the recent Proposal for a Soil Monitoring Law,[58] which introduces a harmonised EU-wide methodology to assess soil health and requires Member States to conduct regular monitoring based on common criteria. The proposal also defines what constitutes "healthy" and "unhealthy" soils and introduces a voluntary soil health certification system as a potential incentive for sustainable soil management. However, as it was pointed out, the law stops short of establishing binding obligations for Member States to restore unhealthy soils,

[54] L. Leone, *A Renewed EU Soil*..., p. 78.

[55] Authors' note: The Soil Framework Directive proposal was ultimately withdrawn in 2014 after prolonged resistance from several Member States, including Germany, France, and the United Kingdom. The main objections concerned subsidiarity, administrative burden, and the perceived lack of added value compared to existing national frameworks.

[56] See European Commission, *Proposal for a Directive establishing a framework for the protection of soil* (Proposal) COM(2006) 232 final.

[57] *Soil Strategy for 2030*, p. 12.

[58] European Commission, *Proposal for a Directive of the European Parliament and of the Council on Soil Monitoring and Resilience (Soil Monitoring Law)* (Proposal) COM/2023/416 final, 2023/0232(COD).

leaving the achievement of soil health targets by 2050 non-binding. This legislative weakness has been criticised for creating a situation where monitoring may improve knowledge, but not necessarily lead to action to restore degraded soils.[59]

At the same time, while EU policies such as the Farm to Fork Strategy and the revised LULUCF Regulation promote carbon farming and carbon removal certification, the lack of a fully operational regulatory and financial framework limits their real-world impact. Current carbon farming initiatives remain largely voluntary, fragmented, and poorly regulated, lacking clear rules for certification, monitoring, and verification.[60] Furthermore, the proposed Carbon Removal Certification Framework has been criticised for failing to clearly distinguish between temporary and permanent carbon storage, raising concerns about the environmental integrity and market credibility of soil carbon certificates.[61] It should be noted that, although the CAP provides financial incentives for sustainable soil management, the uneven application of eco-schemes and agri-environmental measures across Member States raises concerns about their long-term effectiveness and consistency.[62]

Policy fragmentation remains a major structural challenge. Soil functions intersect with multiple sectors, *inter alia*, agriculture, climate policy, energy, biodiversity, and pollution control – yet these policies are rarely coordinated in a way that maximises synergies or prevents conflicts. This lack of integration threatens to undermine the EU's overall ambition to achieve climate neutrality and ecosystem resilience by 2050.

Looking ahead, the success of the EU's soil-related ambitions hinges on the adoption of the proposed Soil Health Law. This legislation is expected to establish binding targets for soil health, define assessment criteria and indicators, and require Member States to develop soil monitoring and restoration strategies. It also holds the potential to provide a legal foundation for emerging market mechanisms, such as soil carbon banks and carbon removal certification schemes. However, as past legislative failures have shown, the political feasibility of such a law remains uncertain and will require strong political will and stakeholder engagement at all levels.[63]

To summarise, while the EU has made significant strides in elevating the importance of soil in its environmental and climate policies, critical gaps in legal mandates, monitoring capacity, financial incentives, and policy coherence persist. Closing these gaps will be essential for unlocking the full potential of

[59] Carbon Gap, *EU Soil Monitoring Law* (webpage), https://tracker.carbongap.org/policy/soil-monitoring-law/ [accessed 29 April 2025].

[60] *Farm to Fork Strategy*, p. 11.

[61] Carbon Gap, *EU Soil Monitoring Law…*

[62] *CAP Strategic Plans Report*, p. 3.

[63] L. Leone, *A Renewed EU Soil Strategy...*, p. 79.

soils as a climate solution and ensuring that the EU's soil, biodiversity, and climate goals could be met in practice.

3. The Slovak legal and policy framework on soil protection and carbon sequestration

3.1. Introductory remarks

While the European Union has adopted an increasingly integrated legal and policy framework to promote soil protection and carbon sequestration, the Slovak Republic has yet to fully align its national framework with these evolving EU objectives. Despite the constitutional recognition of soil as a protected natural resource (see section 3.2), Slovakia lacks a comprehensive legal and policy approach that would systematically integrate soil health and carbon sequestration into its climate, agricultural, and biodiversity strategies.

Notably, the storage of carbon in agricultural soils is not explicitly identified as a priority in Slovakia's Strategic Plan for the Common Agricultural Policy for 2023–2027. While the plan acknowledges broader environmental and climate goals, it fails to introduce specific measures targeting soil-based carbon sequestration. This omission is particularly striking in light of the European Commission's recommendations, which called on Slovakia to intensify its environmental and climate efforts to contribute to the EU's Green Deal objectives, including through enhanced carbon retention in forests and expanded afforestation programmes.[64]

In this context, Slovakia's forestry sector emerges as a relatively stronger contributor to carbon sequestration efforts. Current data indicate that the annual wood harvest remains below the natural increment, ensuring a net positive carbon balance in Slovak forests. In addition, state-owned enterprise Lesy SR[65] has implemented an ambitious afforestation programme, aiming to plant up to 11.5 million seedlings in 2025 alone.[66] Looking ahead, national projections

[64] European Commission, *Commission recommendations for Slovakia's CAP strategic plan* (Staff Working Document) SWD/2020/392 final, pp. 4–5.

[65] State enterprise Lesy Slovenskej republiky (Forests of the Slovak Republic) was established by a decision of the Ministry of Agriculture through the merger of state forest enterprises in Slovakia as well as by the founding charter issued by the Ministry of Agriculture of the Slovak Republic.

[66] Lesy SR: *11,5 milióna stromov v roku 2025 - tradičná starostlivosť o slovenské lesy pokračuje.* Press release, 27 March 2025 (webpage), https://www.lesy.sk/lesy/media/aktuality/aktuality-tlacove-spravy-novinky/tlacove-spravy/lesy-sr-115-miliona-stromov-roku-2025-tradic-

suggest that timber harvesting is expected to decrease by approximately 11% by 2050,[67] further reinforcing the carbon storage capacity of Slovak forests.

We can conclude that these very developments are what lead the Slovak Republic to a promising longer-term trajectory in the forestry sector as close-to-nature forest management gets implemented sectoral. But soil carbon sequestration in agricultural landscapes has yet to receive the same level of strategic attention and institutional backing. The following section presents an in-depth review of Slovakia's current statutory, policy, and institutional arrangements for soil protection and carbon sequestration, with a focus on existing tools and shortcomings to be addressed.

3.2. Constitutional and legislative provisions

In the Slovak Republic, soil is recognised as a natural resource of national importance, protected by the Constitution of the Slovak Republic, which provides that "the state shall ensure the protection and rational use of natural resources, ecological balance, and environmental care."[68] Despite this constitutional recognition, Slovakia lacks a comprehensive and dedicated Soil Protection Act, leaving soil governance fragmented across several sectoral laws and policies.

The Act on the Protection and Use of Agricultural Land[69] represents the most important legal instrument specifically addressing soil in Slovakia. This act regulates soil protection primarily in terms of agricultural productivity, focusing on the prevention of soil sealing, erosion, and degradation. It also establishes administrative procedures for the withdrawal of agricultural land from the agricultural land fund, setting conditions for compensatory measures. However, the act does not explicitly address soil as a carbon sink or integrate climate mitigation objectives into soil management.

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na-starostlivost-slovenske-lesy-pokracuje.html [accessed 29 April 2025]. Available only in the Slovak language.

[67] Ministry of Agriculture and Rural Development of the Slovak Republic, *Analýza udržateľnosti podnikateľských subjektov v primárnom spracovaní listnatej a ihličnatej drevnej hmoty v súvislosti s potenciálom zásob dreva po novej zonácii národných parkov SR s výhľadom do roku 2050* (webpage), https://www.mpsr.sk/download.php?fID=25470 [accessed 29 April 2025]. Available only in the Slovak language.

[68] Article 44, para. 5 of the Act no. 460/1992 Coll. Constitution of the Slovak Republic, as amended.

[69] Act no. 220/2004 Coll. on the Protection and Use of Agricultural Land and on the Amendment of Act No. 245/2003 Coll. on Integrated Pollution Prevention and Control and on Amendments and Supplements to Certain Acts, as amended (hereinafter: Act on the Protection and Use of Agricultural Land).

Other sectoral laws also indirectly relate to soil protection. The Nature and Landscape Protection Act[70] protects specific habitats and ecosystems, including soil-related functions in protected areas, while the Act on Forests[71] governs forest soil management. However, none of these laws provides a systematic legal framework for the protection, monitoring, and restoration of soil health. As noted by Máčaj, land consolidation and landscape design, when aligned with ecological objectives, can enhance water retention, biodiversity, and carbon sequestration – underscoring the importance of integrating **soil health** into land-use law.[72]

This gap is particularly relevant given the high proportion of Slovak land, nearly 9%, that remains in the ownership of unidentified or unregistered owners, managed temporarily by the Slovak Land Fund. As discussed in the authors' previous work,[73] this situation limits the state's ability to actively use these lands for environmental or climate objectives, including carbon sequestration, due to the narrow legal mandate of the Land Fund under Act No. 180/1995 Coll.

This fragmented legislative situation stands in contrast to the strengthened constitutional basis for land and soil protection, which was amended in 2017 to classify agricultural and forest land as non-renewable natural resources subject to special state protection. This constitutional change, which the authors have previously analysed in detail,[74] provides a legally binding basis for the development of new laws and policies focused on soil health, even though it requires further legislative implementation to become fully effective in practice.

3.3. Recent legislative initiatives

An escalating urgency of the climate change problem and ever more ambitious climate policy of the European Union have also triggered at least some legislative responses at the national level in Slovakia. In the past years, Slovakia has introduced only a few measures to mainstream climate and environmental

[70] Act no. 543/2002 Coll. on the Nature and Landscape protection, as amended.

[71] Act no. 24/2006 Coll. on Forests, as amended.

[72] Ľ. Máčaj, *Právna regulácia krajinotvorby na Slovensku ako prostriedok ochrany klímy*, "Acta Universitatis Carolinae Iuridica" 2024, vol. 70, no. 1, pp. 77–92, https://doi.org/10.14712/23366478.2024.6. Available only in the Slovak language.

[73] M. Pavlovič, M. Michalovič, *Challenges and perspectives of the legislative solution to the problem of the plots of land of unidentified owners in the Slovak republic – defining public interest*, in: *Developments in information and knowledge management systems for business applications*, (eds.) N. Kryvinska, M. Greguš, S. Fedushko, Springer Nature, 2023, pp. 541–562, https://doi.org/10.1007/978-3-031-27506-7_20.

[74] M. Pavlovič, M. Michalovič, *Constitutional protection of land in the Slovak Republic*, "Prawne Problemy Górnictwa i Ochrony Środowiska" 2021, vol. 10, no. 2, pp. 1–14, https://doi.org/10.31261/PPGOS.2021.02.06.

concerns into land and soil use. Although these attempts are partial, they provide a foundation on which to create a more cohesive legislation around soil carbon sequestration. Two of the most notable developments in this regard include:

1) the 2025 amendment of the Agricultural Land Act, which introduced agroforestry and landscape features as recognised land use categories; and
2) the unsuccessful legislative proposal for the establishment of a Climate Soil Fund, intended to financially support soil-based climate mitigation efforts.

3.3.1. The 2025 amendment to the Act on the Protection and Use of Agricultural Land

In 2025, Slovakia amended its Act on the Protection and Use of Agricultural Land to formally recognise agroforestry and the creation of landscape features (e.g. windbreaks, hedgerows, wetlands) as legally supported land uses. This amendment aimed to strengthen the multifunctional role of agricultural land, going beyond food production to include biodiversity enhancement, water retention, and carbon sequestration.

The explanatory memorandum to the amendment explicitly referred to the European Green Deal, the EU Biodiversity Strategy for 2030, and the EU Soil Strategy for 2030 as its policy foundations.[75] The amendment introduced new legal provisions encouraging soil conservation measures, including:

– the reduction of soil erosion,
– the preservation of soil organic matter, and
– the integration of landscape elements that can improve microclimatic conditions and soil health.[76]

The amendment was adopted by the National Council of the Slovak Republic on 27 March 2025 and became effective on 1 April 2025. From the Slovak CAP Strategic Plan point of view, it serves the general objective of carbon sequestration as outlined to the promotion of agroforestry systems and afforestation

[75] National Council of the Slovak Republic, *Dôvodová správa, A: všeobecná* časť *k vládnemu návrhu zákona, ktorým sa mení a dopĺňa zákon č. 220/2004 Z. z. o ochrane a využívaní poľnohospodárskej pôdy a o zmene zákona č. 245/2003 Z. z. o integrovanej prevencii a kontrole znečisťovania* životného *prostredia a o zmene a doplnení niektorých zákonov v znení neskorších predpisov a ktorým sa mení zákon č. 188/2003 Z. z. o aplikácii* čistiarenského *kalu a dnových sedimentov do pôdy a o doplnení zákona č. 223/2001 Z. z. o odpadoch a o zmene a doplnení niektorých zákonov v znení neskorších predpisov* (explanatory memorandum). Available only in the Slovak Language.

[76] See Act no. 82/2025 Coll. amending Act No. 220/2004 Coll. on the protection and use of agricultural land and amending Act No. 245/2003 Coll. on integrated prevention and control of environmental pollution and amending certain acts, as amended, and amending Act No 188/2003 Coll. on the application of sewage sludge and bottom sediments to soil and amending Act No. 223/2001 Coll. on waste and amending certain acts, as amended.

of agricultural land. Notwithstanding these laudable objectives, the amendment has been criticised for its failure to provide for proper implementation details and mechanisms, enforcement strategies and financial incentives. As a result, its practical impact on agricultural land management and soil carbon sequestration remains limited, largely depending on voluntary action by landowners. However, the amendment does not provide for direct financial support schemes to incentivise farmers or landowners to meet these new environmental standards. Nor does it establish a framework for compliance control or penalties in the case of persistent soil degradation. This gap raises concerns about the enforceability of the law and the real-world effectiveness of its measures. While we welcome the symbolic recognition of soil carbon sequestration, its operationalisation remains weak and heavily reliant on voluntary participation in our opinion.

3.3.2. The draft proposal for the Climate Soil Fund

The Ministry of Agriculture and Rural Development of the Slovak Republic has announced a legislative intent to establish a new Soil Climate Fund (Slovak: Klimatický fond pre pôdu), aimed at supporting the protection of agricultural and forest land and enhancing the sequestration of carbon in soil. The draft framework, published in 2022, reflects an effort to respond to climate change impacts, land degradation, and the lack of effective instruments for water retention and soil carbon storage in Slovakia. It envisions a systemic integration of the water–soil–vegetation–climate–food–energy nexus, as well as the creation of an institutional infrastructure to reward and support ecosystem services through a dedicated public fund.

The Soil Climate Fund would be a legal entity and a public institution, administered by the Ministry of Agriculture. Its revenue streams would include proceeds from the sale of CO_2 allowances, direct contracts with polluting entities for verified carbon storage projects, penalties for harmful land-use practices, redirected unused EU funds, and international contributions (e.g., from the EBRD or EIB). Its expenditures would be targeted at:

– climate adaptation and mitigation measures on land,
– implementation of new landscape features,
– soil and forest management that increases organic matter and carbon content,
– certification and verification systems for soil-based carbon removal,
– data infrastructure and national land registers,
– pilot research and innovation projects.

A second, more ambitious initiative was the draft proposal for the establishment of a Climate Soil Fund, registered under legislative procedure no. LP/2022/478. This proposal, developed by the Ministry of Environment of the Slovak Republic, aimed to create a national-level financial mechanism

to support carbon farming and soil restoration. The proposed fund was designed to provide direct payments or incentives for landowners and land managers who implement verified carbon sequestration practices, such as:

– reduced tillage,
– cover cropping,
– agroforestry, or
– the establishment of permanent grasslands and wetlands.

From a legal perspective, the Ministry of Environment of the Slovak Republic proposal appears more suitable as a foundation for a soil carbon banking system, given its broader scope and its compatibility with EU-level carbon certification mechanisms. However, its implementation would require stronger institutional capacity and inter-ministerial cooperation. Ideally, elements of both drafts, namely the investment tools from the Ministry of Agriculture and Rural Development of the Slovak Republic and the regulatory ecosystem model from the Ministry of Environment of the Slovak Republic proposal should be synthesised into a single coherent framework. Despite its potential, the legislative proposal remains at the conceptual stage. As of 2025, no official draft bill has been submitted for public or parliamentary debate. This delay suggests either a lack of political will or institutional capacity to move from vision to implementation.

From a policy evaluation perspective, the Soil Climate Fund represents a forward-thinking solution, capable of addressing systemic weaknesses in Slovakia's land-based climate governance. If properly enacted and resourced, it could fill key gaps in financing and institutional coordination for soil carbon sequestration. However, its success will depend on the clarity of legal definitions, eligibility criteria, and the establishment of credible monitoring and certification mechanisms.

3.4. Gaps in the current framework

Despite being the site of recent policy and legislative measures, Slovakia's legal and institutional infrastructure for soil protection and carbon sequestration continues to be insufficient to support national climate goals or to live up to European Union expectations in this area. One of the most significant gaps is the absence of a comprehensive and dedicated Soil Protection Act. While soil is mentioned in several sectoral laws, including the Agricultural Land Act, the Nature and Landscape Protection Act, and the Forest Act, these instruments do not form an integrated legal framework that addresses soil health, carbon storage, and ecosystem services in a holistic manner. Soil continues to be regulated primarily as a productive resource rather than as a climate-relevant carbon sink. However, a future Soil Protection Act could serve as a critical enabling framework for soil carbon governance. Its objectives could include the preservation

and enhancement of soil organic carbon, the regulation of land use practices that affect soil health, and the implementation of national soil monitoring systems. The Act could establish legal definitions of soil degradation, outline mandatory standards for carbon-relevant land management (such as minimum soil cover or organic input requirements), and provide legal backing for certification and verification schemes. Additionally, it could introduce financial or tax incentives for regenerative farming and carbon sequestration activities, thereby facilitating the integration of Slovak agriculture into emerging EU carbon markets. In this sense, such a law would not only address long-standing regulatory gaps but also serve as a legal basis for deploying soil carbon banking instruments in Slovakia.

The 2025 amendment to the Agricultural Land Act, while symbolically important, lacks operational clarity and enforcement mechanisms. The promotion of agroforestry and landscape features remains largely voluntary, with no dedicated funding or monitoring obligations to ensure wide-scale implementation. This limits the amendment's potential to deliver measurable climate or biodiversity benefits.

Similarly, the failure to adopt the Climate Soil Fund illustrates the institutional and political barriers to operationalising soil carbon sequestration in Slovakia. Without targeted financial incentives, certification mechanisms, and clear governance structures, Slovakia risks falling behind other Member States in implementing soil-based climate solutions. This is reflected in Slovakia's National Energy and Climate Plan (NECP), which pays limited attention to soil-based carbon sequestration and fails to fully integrate land-based mitigation measures into the country's climate strategy, despite the EU's increased focus on natural carbon sinks.

Recent policy discussions have highlighted the potential for Slovakia to explore legal frameworks for establishing a national soil carbon bank. Such a mechanism could enable landowners to generate tradable soil carbon credits, supported by certification and verification systems. This would open opportunities for integrating soil carbon sequestration into Slovakia's emissions trading or creating public-private partnerships for pilot projects aimed at scaling carbon farming.

Another key shortcoming is the absence of a national soil monitoring system, which will be able to track soil health indicators, carbon stocks, and land management practices Without good data that can be compared through time, what cannot be measured cannot be managed. Reliable data and transparency are needed in order to assess the impact of policies, comply with climate reporting obligations, and remain available on the emerging carbon markets.

Finally, the policy system in Slovakia is characterised by a high degree of sectoral isolation and insufficient coordination between agricultural, environmental, and climate-related policies. Furthermore, we still lack a long-term focus and the institutional capacity in the forestry sector, and there is a danger

that the said sector will concentrate on long-term carbon retention by sustainable forest management, a trend that is not (as of yet) the case for agricultural soils. In conclusion, Slovakia is not currently in a position to fully exploit the potential of soil carbon sequestration as a means of climate change mitigation, both from a legal and an institutional and financial perspective. Addressing these gaps will demand political will, legislative creativity, and cross-sectoral coordination, which must be underpinned by strong monitoring and creating adequate financial incentives from the state.

4. Evaluation and recommendations

4.1. Overall evaluation

The analysis of the European and Slovak legal and policy frameworks presented in this article reveals a significant implementation gap between the European Union's ambitions and Slovakia's current regulatory practice. While the EU Soil Strategy for 2030 and related policies provide a coherent political vision for achieving healthy soils and increasing soil carbon sequestration, Slovakia's legal and policy response remains fragmented, underdeveloped, and weakly enforced.

At the European level, the lack of binding legal obligations for soil health remains a structural limitation, although the proposed Soil Health Law and the recent Soil Monitoring Law offer a promising pathway toward a more enforceable governance framework. However, as recent expert evaluations suggest, these measures risk becoming mere data collection exercises if not accompanied by clear restoration obligations and sufficient financial support.[77]

From a national perspective, the 2025 amendment of the Agricultural Land Act in Slovakia can be considered as a positive step, where agroforestry and landscape elements are now being treated as approved land uses. However, its strength is tempered by the lack of dedicated funding, monitoring, and enforcement provisions, which leaves the programme mostly voluntary at the discretion of individual landowners.

The reluctance to adopt the proposed Climate Soil Fund further demonstrates institutional and political barriers to operationalising soil carbon sequestration at scale. This decision is particularly unfortunate given that the OECD, in its 2024 Environmental Performance Review for the Slovak Republic, explicitly recognised the proposed fund as one of the three key instruments for advancing

[77] European Commission, *Proposal for a Directive of the European Parliament and of the Council on Soil Monitoring and Resilience (Soil Monitoring Law)* (Proposal) COM/2023/416 final, 2023/0232(COD), pp. 3–4.

soil and climate policy. Alongside a soil information and monitoring system and a carbon and water bank, the fund was seen as a promising mechanism to offer innovative incentives to landowners and contribute to multiple environmental objectives.[78]

Without targeted financial incentives and certification mechanisms, Slovakia is unlikely to mobilise landowners to participate in carbon farming or soil restoration activities.[79] This leaves Slovakia in danger of losing the chance to benefit from forthcoming EU-level carbon markets and financial tools, which are to fund nature-based climate solutions. The absence of a national soil monitoring system also weakens the country's capacity to monitor soil health, measure carbon stocks and evaluate policy effectiveness. In the absence of good data, what tools does policy have to develop evidence-based policy measures or fulfil their EU reporting tasks?

In contrast, the forestry sector shows a more positive trajectory, with sustainable forest management practices contributing to long-term carbon storage. The planned decrease in timber harvesting and the extensive afforestation programmes carried out by Lesy SR, š.p., including the planting of 11.5 million seedlings in 2025, indicate a strategic commitment to maintaining and enhancing forest carbon sinks. According to model-based projections, scenarios with reduced harvesting rates are expected to maintain significantly higher levels of carbon removals from the atmosphere compared to business-as-usual approaches, with potential net removals of up to 2,800 kt CO_2 annually by 2050 under current realised harvesting patterns.[80] The agricultural sector, however, lacks such alignment of focus and institutional capability, especially as the soil-based carbon sequestration is concerned. This imbalance highlights the demand for a more holistic and integrated strategy that combines forestry and agricultural landscapes.

4.2. Key recommendations

Based on the analysis, we came to several conclusions, and we are offering several recommendations that are made with our intention to improve the legislation and policy in Slovakia in the area of soil protection and carbon sequestration:

[78] OECD, *OECD Environmental Performance Reviews: Slovak Republic 2024*. 2024, OECD Environmental Performance Reviews, OECD Publishing, Paris, https://doi.org/10.1787/108238e8-en.

[79] J. Verschuuren, *Achieving agricultural greenhouse gas emission reductions in the EU post-2030: What options do we have?*, "Review of European, Comparative & International Environmental Law" 2022, vol. 31, no. 2, pp. 246–257, https://doi.org/10.1111/reel.12448.

[80] I. Barka et al., *Carbon sequestration in living biomass of Slovak forests: recent trends and future projection*, "Central European Forestry Journal" 2020, vol. 66, no. 4, pp. 191–201, https://doi.org/10.2478/forj-2020-0020.

I. **Adopt a comprehensive Soil Protection Act**, based on the upcoming EU Soil Health Law, that will set binding soil health standards and obligations to monitor the quality of the soil and provide restoration objectives.
II. **Operationalise financial incentives for soil carbon sequestration**, for example, by reasserting the Carbon Soil Fund proposal or the integration of carbon farming payments into the CAP Strategic Plan.
III. **Create a National Soil Monitoring System**, aligned to the EU Soil Monitoring Law, delivering accurate data on soil health, carbon stocks, and land management.
IV. **Reinforce cross-sectoral coordination** between agriculture, forestry, environment, and climate policies for an integrated governance of soil as a multifunctional resource.
V. **Use targeted financing, technical support, and monitoring and enforcement** to encourage wider adoption of agroforestry and landscape features.

By addressing these gaps, Slovakia can improve its contribution to the EU's climate and biodiversity targets, enhance the resilience of its agricultural and forest ecosystems, and position itself as a leader in soil-based climate solutions.

Bibliography

Professional and academic publications

Barka I., Priwitzer T., Pavlenda P., *Carbon sequestration in living biomass of Slovak forests: recent trends and future projection*, "Central European Forestry Journal" 2020, vol. 66, no. 4, pp. 191–201, https://doi.org/10.2478/forj-2020-0020.

Hermoso V., Morán-Ordóñez A., Canessa S., Brotons L., *Integrating biodiversity, climate, and water policy: The EU Biodiversity Strategy for 2030*, "Environmental Science & Policy" 2022, vol. 132, pp. 75–83, https://doi.org/10.1016/j.envsci.2022.02.024.

Heuser I., *Soil Governance in current European Union Law and in the European Green Deal.* "Soil Security" 2022, vol. 6, 100053, https://doi.org/10.1016/j.soisec.2022.100053.

Jakl Š., *Ochrana půdy z hlediska obsahu organické hmoty*, in: *Půda v právních vztazích: aktuální otázky,* Spisy Právnické fakulty Masarykovy univerzity, řada teoretická, Edice Scientia, (eds.) J. Tkáčiková, V. Vomáčka, D. Židek et al., Masarykova univerzita, Brno 2020. Available online.

Lal R., *Soil Carbon Sequestration Impacts on Global Climate Change and Food Security*, "Science" 2004, vol. 304, pp. 1623–1627.

Leone L., *A Renewed EU Soil Strategy for Climate-Smart Agriculture*, "Rivista Quadrimestrale di Diritto dell'Ambiente" 2023, vol. 2, pp. 75–108. https://www.researchgate.net/publication/376612859 [accessed 30 March 2025].

Longbottom T. et al.: *What's Soil Got to Do with Climate Change?*, "GSA Today" vol. 32, no. 5, pp. 4–10, https://doi.org/10.1130/GSATG519A.1.

Máčaj Ľ., *Legal Regulation of Landscaping in Slovakia as a Means of Climate Protection*, "Acta Universitatis Carolinae Iuridica" 2024, vol. 70, no. 1 pp. 77–92, https://doi.org/10.14712/23366478.2024.6.

Montanarella L., Panagos P., *The relevance of sustainable soil management within the European Green Deal: A review*, "Land Use Policy" 2021, vol. 100, 104950, https://doi.org/10.1016/j.landusepol.2020.104950.

Palšová L., Bohátová Z., Lazíková J., *Quality Soil as a Pathway to Healthy Food in the Eu – Project Information,* "EU Agrarian Law" 2021, vol. X, no. 2, pp. 28-29.

Panagos P., Borrelli P., Jones A., Robinson D. A., *A 1 Billion Euro Mission: A Soil Deal for Europe*, "European Journal of Soil Science" 2024, pp. 1–4, https://doi.org/10.1111/ejss.13466.

Pavlovič M., Michalovič M., *Challenges and perspectives of the legislative solution to the problem of the plots of land of unidentified owners in the Slovak republic – defining public interest*, in: *Developments in information and knowledge management systems for business applications*, (eds.) N. Kryvinska, M. Greguš, S. Fedushko, Springer Nature, 2023, pp. 541–562, https://doi.org/10.1007/978-3-031-27506-7_20,

Pavlovič M., Michalovič M., *Constitutional protection of land in the Slovak Republic*. In: "Prawne Problemy Górnictwa i Ochrony Środowiska" 2021, vol. 10, no. 2, pp. 1–14, https://doi.org/10.31261/PPGOS.2021.02.06.

Verschuuren J., *Achieving agricultural greenhouse gas emission reductions in the EU post-2030: What options do we have?*, "Review of European, Comparative & International Environmental Law" 2022, vol. 31, no. 2, pp. 246–257, https://doi.org/10.1111/reel.12448.

Vodička J., *Advancing Circular Economy: Czech perspective*, "Journal of Agricultural and Environmental Law" 2024, vol. 36, no. 19, pp. 224–248. https://doi.org/10.21029/JAEL.2024.36.255.

Legally binding and non-legally binding documents and legislation

Act no. 460/1992 Coll. Constitution of the Slovak Republic, as amended.

Act No. 180/1995 Coll. on Certain Measures for Land Ownership Arrangements.

Act No. 543/2002 Coll. on Nature and Landscape Protection, as amended.

Act No. 220/2004 Coll. on the Protection and Use of Agricultural Land, as amended.

Act No. 326/2005 Coll. on Forests, as amended.

Act No. 24/2006 Coll. on Environmental Impact Assessment.

Act no. 82/2025 Coll. amending Act No. 220/2004 Coll. on the protection and use of agricultural land and amending Act No. 245/2003 Coll. on integrated prevention and control of environmental pollution and amending certain acts, as amended, and amending Act No. 188/2003 Coll. on the application of sewage sludge and bottom sediments to soil and amending Act No. 223/2001 Coll. on waste and amending certain acts, as amended.European Commission, *A Sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment* (Communication) COM/2018/673 final.

European Commission, *The European Green Deal* (Communication) COM/2019/640 final.

European Commission, *Chemicals Strategy for Sustainability Towards a Toxic-Free Environment* (Communication) COM/2020/667 final.

European Commission, *A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system* (Communication) COM/2020/381 final.

European Commission, *Chemicals Strategy for Sustainability Towards a Toxic-Free Environment* (Communication) COM/2020/667 final.

European Commission, *A new Circular Economy Action Plan. For a cleaner and more competitive Europe* (Communication) COM/2020/98 final.

European Commission, *Pathway to a Healthy Planet for All EU Action Plan: "Towards Zero Pollution for Air, Water and Soil"* (Communication) COM/2021/400 final.

European Commission, *Communication from the Commission to the European Parliament and the Council: Sustainable Carbon Cycles* (Communication) COM/2021/800 final.

European Commission, *EU Soil Strategy for 2030: Reaping the benefits of healthy soils for people, food, nature and climate* (Communication) COM/2021/699 final.

European Commission, *"Fit for 55": delivering the EU's 2030 Climate Target on the way to climate neutrality* (Communication) COM/2021/550 final.

European Commission, *New EU Forest Strategy for 2030: Forests for sustainable and climate-resilient futures* (Communication) COM/2021/572 final.

European Commission, *Forging a climate-resilient Europe – the new EU Strategy on Adaptation to Climate Change* (Communication) COM/2021/82 final.

European Commission, *On European Missions* (Communication) COM/2021/609 final.

European Commission: *Proposal for a Directive establishing a framework for the protection of soil* (Proposal) COM/2006/232 final.

European Commission, *Proposal for a Regulation of the European Parliament and of the Council on Soil Monitoring and Resilience* (Soil Monitoring Law) (Proposal) COM/2023/416 final.

European Commission, *Commission recommendations for Slovakia's CAP strategic plan* (Staff Working Document) SWD/2020/392 final.

European Court of Auditors, *Common Agricultural Policy and Climate: Half of EU Climate Spending but Farm Emissions Are Not Decreasing* (Special Report 16/2021).

National Council of the Slovak Republic, *Dôvodová správa, A: všeobecná* časť *k vládnemu návrhu zákona, ktorým sa mení a dopĺňa zákon č. 220/2004 Z. z. o ochrane a využívaní poľnohospodárskej pôdy a o zmene zákona č. 245/2003 Z. z. o integrovanej prevencii a kontrole znečisťovania* životného *prostredia a o zmene a doplnení niektorých zákonov v znení neskorších predpisov a ktorým sa mení zákon č. 188/2003 Z. z. o aplikácii* čistiarenského *kalu a dnových sedimentov do pôdy a o doplnení zákona č. 223/2001 Z. z. o odpadoch a o zmene a doplnení niektorých zákonov v znení neskorších predpisov* (explanatory memorandum). Available only in the Slovak Language.

OECD, *OECD Environmental Performance Reviews: Slovak Republic 2024. 2024, OECD Environmental Performance Reviews*, OECD Publishing, Paris, https://doi.org/10.1787/108238e8-en.

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.

Internet sources

Carbon Gap, *EU Soil Monitoring Law*. 2025. [online], https://tracker.carbongap.org/policy/soil-monitoring-law/ [accessed 29 April 2025].

European Court of Auditors, EU efforts for sustainable soil management. Unambitious standards and limited targeting. (Special Report No 19/2023), p. 11 (webpage), https://www.eca.europa.eu/ECAPublications/SR-2023-19/SR-2023-19_EN.pdf [accessed 29 April 2025].

European Parliament: European Parliament Resolution of 28 April 2021 on Soil Protection (Resolution) 2021/2548(RSP) (webpage), https://www.europarl.europa.eu/doceo/document/TA-9-2021-0143_EN.html

Lesy SR: *11,5 milióna stromov v roku 2025 - tradičná starostlivosť o slovenské lesy pokračuje*. Press release, 27.3.2025. (webpage), https://www.lesy.sk/lesy/media/aktuality/aktuality-tlacove-spravy-novinky/tlacove-spravy/lesy-sr-115-miliona-stromov-roku-2025-tradicna-starostlivost-slovenske-lesy-pokracuje.html [accessed 29 April 2025], only in Slovak Language.

Ministry of Agriculture and Rural Development of the Slovak Republic, *Analýza udržateľnosti podnikateľských subjektov v primárnom spracovaní listnatej a ihličnatej drevnej hmoty*

v súvislosti s potenciálom zásob dreva po novej zonácii národných parkov SR s výhľadom do roku 2050. (webpage), https://www.mpsr.sk/download.php?fID=25470 [accessed 29 April 2025] Available only in the Slovak Language.

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Maroš Pavlovič, Matúš Michalovič

Tworzenie ram prawnych dla banku węgla glebowego na Słowacji: analiza polityk i rekomendacje w kontekście prawa i polityki Unii Europejskiej

Streszczenie

Gleba stanowi największy lądowy rezerwuar węgla w Europie, mający podstawowe znaczenie dla osiągnięcia neutralności klimatycznej, ochrony bioróżnorodności i bezpieczeństwa żywnościowego. Pomimo to jest jedynym ważnym zasobem naturalnym w Unii Europejskiej, którego nie obejmują wiążące ramy prawne. Unijna strategia glebowa do 2030 r. oraz powiązane z nią polityki będące częścią Europejskiego Zielonego Ładu wyznaczają kierunek działań na rzecz odwrócenia procesu degradacji gleb i zwiększenia ich zdolności do pochłaniania węgla, jednak na poziomie zarówno unijnym, jak i krajowym utrzymują się istotne luki prawne i polityczne.

W artykule przeanalizowano ewolucję wytycznych unijnych, w tym projekt rozporządzenia w sprawie zdrowia gleby (Soil Health Law) oraz ramy certyfikacji pochłaniania dwutlenku węgla (Carbon Removal Certification Framework). Ocenie poddano również reakcję Słowacji na poziomie krajowym, ze szczególnym uwzględnieniem nowelizacji ustawy o gruntach rolnych planowanej na 2025 r. i nieudanego projektu utworzenia Funduszu Klimatycznego na rzecz Gleb. Pomimo tych inicjatyw w słowackim systemie prawnym wciąż brakuje jednoznacznych przepisów, odpowiednich bodźców finansowych oraz skoordynowanych polityk, które wspierałyby działania polegające na ochronie i odbudowie gleb. W artykule wykazano, że owe braki hamują wdrażanie środków sekwestracji węgla w glebie. Sformułowano też rekomendacje dotyczące przyjęcia kompleksowej ustawy o ochronie gleb, wprowadzenia zachęt finansowych dla rolnictwa węglowego, usprawnienia systemu monitoringu gleb i wzmocnienia

integracji polityk sektorowych. Bez tego nie sposób w pełni wykorzystać potencjału klimatycznego gleb ani dostosować Słowacji do unijnych celów w zakresie klimatu i bioróżnorodności.

Słowa kluczowe: ochrona gleb, sekwestracja węgla, strategia glebowa UE do 2030 r., rolnictwo węglowe, neutralność klimatyczna, glebowe magazynowanie węgla

Марош Павлович, Матуш Михалович

Создание правовой рамки для почвенного углеродного банка в Словакии: анализ политики и рекомендации в контексте права и политики Европейского союза

Резюме

Почва является крупнейшим наземным резервуаром углерода в Европе, критически важным для достижения климатической нейтральности, сохранения биоразнообразия и продовольственной безопасности. При этом она является единственным важным природным ресурсом в Европейском союзе, не подпадающим под действующие законы. Почвенная стратегия ЕС до 2030 г. и связанная с ней политика в рамках Европейского зеленого курса обеспечивают основу для действий, направленных на предотвращение процесса деградации почв и повышение способности почвы к секвестрации углерода, однако как на уровне ЕС, так и на национальном уровне сохраняются значительные правовые и политические пробелы.

В данной статье рассматривается эволюция директив ЕС, включая проект закона о здоровье почв (Soil Health Law) и Систему сертификации удаления углерода (Carbon Removal Certification Framework). Также оцениваются действия Словакии на национальном уровне, с особым акцентом на поправку к закону о сельскохозяйственных землях, запланированную на 2025 год, и неудачный проект по созданию Климатического фонда в пользу почв. Несмотря на эти инициативы, в словацкой правовой системе по-прежнему отсутствуют четкие правила, адекватные финансовые стимулы и скоординированная политика, направленная на поддержку усилий по защите и восстановлению почв. В статье показано, что эти недостатки препятствуют реализации мер по секвестрации почвенного углерода. Также приведены рекомендации по принятию комплексного закона о защите почв, введению финансовых стимулов для углеродного земледелия, совершенствованию системы мониторинга почв и усилению интеграции отраслевой политики. Без этого невозможно в полной мере использовать климатический потенциал почв и добиться выполнения Словакией целей ЕС в области климата и биоразнообразия.

Ключевые слова: защита почв, секвестрация углерода, почвенная стратегия ЕС до 2030 г., углеродное земледелие, климатическая нейтральность, хранение углерода в почве

Maroš Pavlovič, Matúš Michalovič

Creazione di un quadro giuridico per una banca del carbonio nel suolo in Slovacchia: analisi delle politiche e raccomandazioni nel contesto del diritto e delle politiche dell'Unione Europea

Sommario

Il suolo costituisce il più grande serbatoio terrestre di carbonio in Europa, rivestendo un'importanza fondamentale per il raggiungimento della neutralità climatica, la tutela della biodiversità e la sicurezza alimentare. Nonostante ciò, esso rappresenta l'unica rilevante risorsa naturale nell'Unione europea che non sia ancora disciplinata da un quadro normativo vincolante. La Strategia dell'UE per il suolo al 2030 e le politiche ad essa connesse, inserite nel contesto del Green Deal europeo, delineano gli orientamenti per contrastare il processo di degradazione del suolo e rafforzarne la capacità di assorbimento del carbonio; permangono tuttavia significative lacune normative e politiche, sia a livello unionale sia nazionale.

L'articolo analizza l'evoluzione delle linee guida dell'UE, compreso il progetto di regolamento sulla salute del suolo (Soil Health Law) e il quadro di certificazione per l'assorbimento del carbonio (Carbon Removal Certification Framework). Viene altresì valutata la risposta nazionale della Slovacchia, con particolare attenzione alla riforma della legge sui terreni agricoli prevista per il 2025 e al progetto, non riuscito, di istituire un Fondo climatico per il suolo. Nonostante tali iniziative, nell'ordinamento giuridico slovacco continuano a mancare disposizioni chiare, adeguati incentivi finanziari e politiche coordinate in grado di sostenere azioni di tutela e ripristino del suolo. L'articolo mostra come tali carenze ostacolino l'attuazione delle misure di sequestro del carbonio nel suolo. Vengono inoltre formulate raccomandazioni riguardanti l'adozione di una legge globale sulla protezione del suolo, l'introduzione di incentivi finanziari per l'agricoltura carbonica, il miglioramento del sistema di monitoraggio del suolo e il rafforzamento dell'integrazione tra politiche settoriali. Senza questi interventi, non sarà possibile sfruttare appieno il potenziale climatico dei suoli né adeguare la Slovacchia agli obiettivi dell'UE in materia di clima e biodiversità.

Parole chiave: tutela del suolo, sequestro del carbonio, Strategia dell'UE per il suolo 2030, agricoltura carbonica, neutralità climatica, stoccaggio del carbonio nel suolo