



EU Soil Strategy Actions Tracker

A tool to track the actions listed in the EU Soil Strategy for 2030

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Abstract

The EU Soil Strategy for 2030 sets out a framework to ensure that soils are used sustainably by setting concrete measures to protect and restore soils. It sets a vision and objectives to achieve healthy soil by 2050, with concrete actions due by 2030. The newly developed 'EU Soil Strategy Actions Tracker' is a tool to track the progress of these concrete actions since the adoption of the EU Soil Strategy in 2021. The EU Soil Strategy Actions Tracker provides an overview on the status of the actions, information on the due date, recent updates, links to related EU policies, links to relevant sources, and the main actors responsible for implementation. Currently, 62 out of 90 actions (69%) are marked as completed, 24 actions (27%) as in progress, and 4 actions (4%) as withdrawn. The EU Soil Strategy Actions Tracker provides a clear overview of the progress made by the European Commission under the EU Soil Strategy. With almost 70% of complete actions, the tracker shows that the Commission is well on track to complete most of the actions included in the EU Soil Strategy. Together with the EU Soil Observatory (EUSO) Soil Degradation Dashboard, it provides an informative overview on EU soil health status and ongoing actions to preserve and restore the state of soils in the EU. The EU Soil Strategy Actions Tracker is the first step towards an EUSO Soil Policy Actions Tracker to monitor EU policy actions relevant to soils, other policies (e.g. EU Climate Law) are foreseen to be included in 2025.

Acknowledgements

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1 Introduction

Soil and the multitude of organisms that live in it provide us with resources and regulate the water, carbon and nutrient cycles that make life on land possible. Yet, 60-70% of EU soils are unhealthy, facing one or more degradation pressures, such as erosion or organic matter decline (Panagos et al., 2024). Soil degradation costs the EU tens of billions of euros annually and threatens food security, necessitating government attention, public awareness, and investment in prevention and restoration (Veerman et al., 2020). Healthy soils provide economic benefits as well as ecosystem services, aligning with the EU's climate, biodiversity, and long-term goals. Overall, the value of soil must be properly reflected in natural capital accounts such that our dependence on it becomes more apparent.

To avoid the risks and impacts that continued soil degradation will have on the economy and people's wellbeing, soils deserve the utmost and urgent attention of public authorities at all levels as well economic operators, soil users, local communities and citizens. The EU therefore adopted in 2021 the EU Soil Strategy for 2030¹ to protect and restore soils while engaging society. The vision of the Soil Strategy includes that by 2050, all EU soil ecosystems are in healthy condition and are thus more resilient. According to this vision, by 2025, protection, sustainable use and restoration of soil has become the norm. As a key solution, healthy soils contribute to address our big challenges of achieving climate neutrality and becoming resilient to climate change, developing a clean and circular (bio)economy, reversing biodiversity loss, safeguarding human health, halting desertification and reversing land degradation. The EU Soil Strategy involves a mix of voluntary and legally binding EU measures under the European Green Deal, respecting national policies of Member States. This new vision for soil is also anchored in the EU Biodiversity Strategy 2030², and the EU Climate Adaptation Strategy³.

The monitoring of the implementation of the EU Biodiversity Strategy 2030 is done by the EU Biodiversity Strategy Actions Tracker⁴, developed by the Knowledge Centre for Biodiversity at the Joint Research Centre (JRC). However, whereas the EU Biodiversity Strategy includes policy actions related to soils, a dedicated policy tracker for EU soils is lacking. A total of fourteen EU policy frameworks include actions related to soils stemming from the European Green Deal. The main framework focusing on soils however is the EU Soil Strategy for 2030 (**Figure 1**).

Until now, no clear overview of the developments and the status of the actions listed in the EU Soil Strategy for 2030 was available. There was no systematic reporting on the extent to which the European Commission and EU Members States have fulfilled the actions and objectives listed in the Soil Strategy. Therefore, the EU Soil Strategy Actions Tracker was created by the EU Soil Observatory, with the support of the Directorate-General for the Environment (DG ENV). This tool aims to track the progress of the concrete measures and actions listed in the EU Soil Strategy 2050. It aims to be an assessment of progress on policy commitments within the EU Soil Strategy, made for a wide audience ranging from policy makers, relevant stakeholders, and EU citizens.

¹ https://environment.ec.europa.eu/topics/soil-and-land/soil-strategy_en

² https://environment.ec.europa.eu/strategy/biodiversity-strategy-2030_en

³ https://climate.ec.europa.eu/eu-action/adaptation-climate-change/eu-adaptation-strategy_en

⁴ <https://dopa.jrc.ec.europa.eu/kcbd/actions-tracker/>

The present report aims to provide an overview of the development and the functionalities of the EU Soil Strategy Actions Tracker. The report also contains an outlook for next steps and planned developments regarding the Actions Tracker.

Figure 1. Links between the EU Soil Strategy for 2030 and other EU policies stemming from the European Green Deal.



Source: EU Soil Strategy for 2030.

2 Methodology

2.1 Database

The status and the details of each action registered in the EU Soil Strategy for 2030 were recorded in a database. The following details were recorded for each of action in the EU Soil Strategy for 2030:

- Action details, as described in the EU Soil Strategy for 2030;
- Status of the action, following **Table 1**;
- Due date, as defined in the EU Soil Strategy for 2030;
- Recent updates on the action, with hyperlinks to relevant documents or websites;
- Links to related EU policies, with hyperlinks to relevant documents or websites;
- Relevant sources, with hyperlinks to relevant documents or websites;
- Main actors involved in the action (i.e. the respective Directorate-General (DG) of the European Commission).

Only publicly available documents were taken into account.

The EU Soil Strategy 2030 has a number of policy actions that are to be implemented at Member State (MS) level. Currently, DG ENV is collating the progress on these objectives in cooperation with MS representatives. In the current version of the tracker, these actions have been set to 'in progress'.

Table 1. Action status and details

Action status	Details
Completed	<ul style="list-style-type: none">— Initiative taken by the European Commission— Legislative text proposed by the European Commission
In progress	<ul style="list-style-type: none">— Action initiated, but not yet completed— Planned activities in the near future— Distinction between Delayed / On track
Withdrawn	<ul style="list-style-type: none">— Policy action has been withdrawn or discontinued

Source: JRC analysis.

2.2 Webpage

The EU Soil Strategy Actions Tracker was developed as a webpage on the website of the European Soil Data Centre (ESDAC). The EU Soil Strategy Actions Tracker builds forth on the KCBD Tracker⁵ from the Joint Research Centre designed to track the implementation of the Biodiversity Strategy 2030.

⁵ <https://dopa.jrc.ec.europa.eu/kcbd/actions-tracker/>

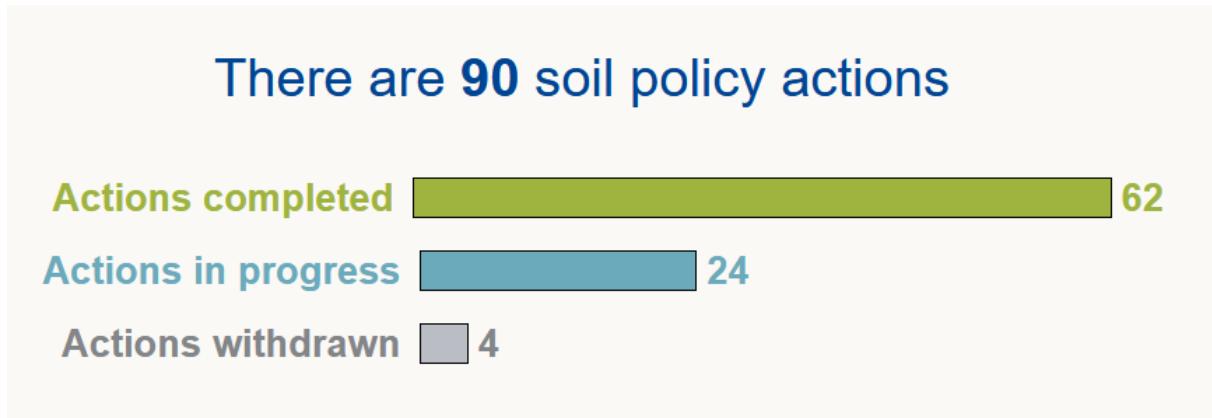
3 Results: The EU Soil Strategy Actions Tracker

The status and details of all actions registered in the EU Soil Strategy for 2030 are listed in **Annex 1** and on the webpage of the EU Soil Strategy Actions Tracker:

<https://esdac.jrc.ec.europa.eu/esdacviewer/action-tracker/>

The EU Soil Strategy for 2030 includes 90 actions. Currently, 62 out of these 90 actions (69%) are marked as completed, 24 actions (27%) as in progress, and 4 actions (4%) as withdrawn (**Figure 2**). With almost 70% of complete actions, the tracker shows that the Commission is well on track to complete most of the actions included in the EU Soil Strategy.

Figure 2. Summary of the status of the actions included in the EU Soil Strategy for 2030.



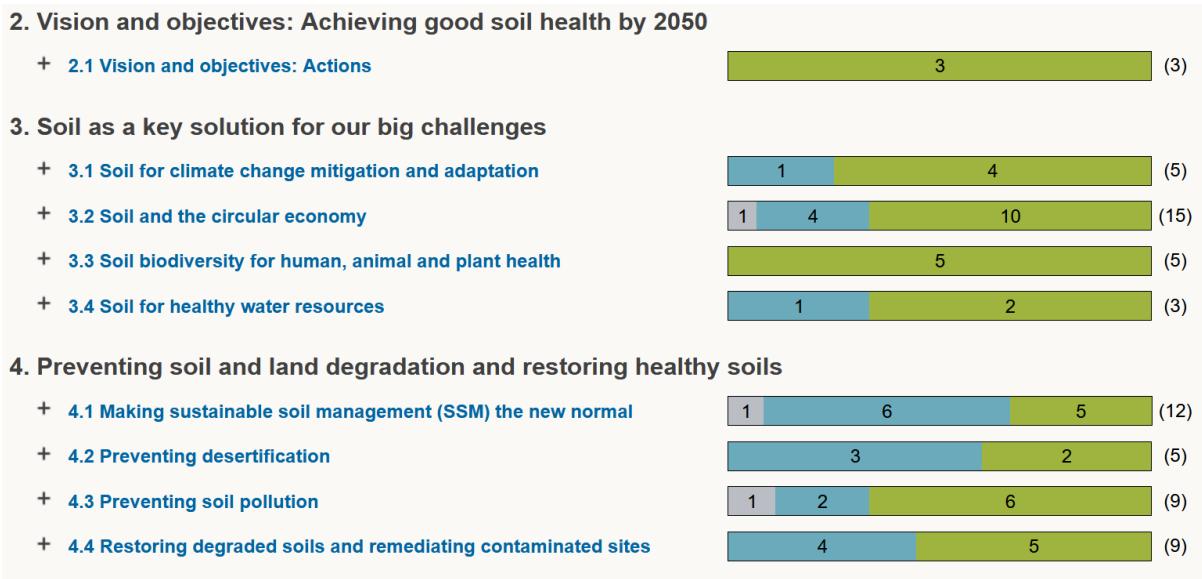
Source: JRC analysis.

The webpage of the EU Soil Strategy Actions Tracker is set up in three levels:

1. At the first level, the EU Soil Strategy Actions Tracker provides a general overview on the status of the actions grouped by each section in the EU Soil Strategy for 2030 (**Figure 3**). For example, level 3: 'Soil as a key solution for our big challenges'.
2. At the second level, the Tracker provides an overview of the status of the individual actions within one section of the EU Soil Strategy for 2030 (**Figure 4**). For example, level 3.1: 'Soils for climate change and adaptation'.
3. At the third level, the Tracker provides an overview of the individual action, including the status, action details, due date, recent updates, links to related EU policies, links to relevant sources, and main actors (**Figure 5**). For example, level 3.1.5: 'Consider proposing legally binding objectives to limit drainage of organic soils and restore peatlands'.

The actions can be filtered by action status through clicking on the summary graph at the top of the webpage (**Figure 2**). By doing so, only the actions that correspond to the selected status are displayed.

Figure 3. Level one. Overview on the status of the actions at the level of the sections in the EU Soil Strategy for 2030.



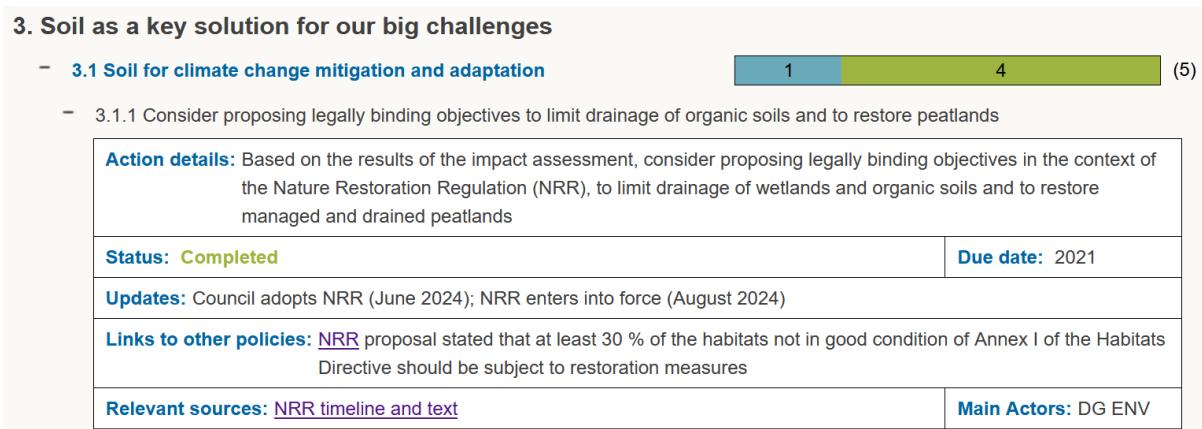
Source: JRC analysis.

Figure 4. Level two. Overview on the status of the individual actions within one section of the EU Soil Strategy for 2030.



Source: JRC analysis.

Figure 5. Level three. Overview on the status and details of the individual actions.



Source: JRC analysis.

4 Next steps

The EU Soil Strategy Actions Tracker is the first step in the development of the EUSO Soil Policy Actions Tracker to monitor EU policy actions relevant to sustainable soil management, other policies (e.g. EU Climate Law) are foreseen to be included in 2025. This EUSO Soil Policy Actions Tracker will be updated twice a year to illustrate progress in policy implementation. As such, EUSO aims to develop a tool to regularly assess the progress on formal EU policy commitments on soil.

Together with the EU Soil Observatory Soil Degradation Dashboard⁶ (Panagos et al., 2024), the EUSO Soil Policy Actions Tracker will provide an informative overview on EU soil health status and ongoing actions to preserve and restore the state of soils in the EU.

⁶ <https://esdac.jrc.ec.europa.eu/esdacviewer/euso-dashboard/>

5 Conclusions

The newly developed ‘EU Soil Strategy Actions Tracker’ is a tool to track the progress of the concrete actions listed in the EU Soil Strategy for 2030. The EU Soil Strategy Actions Tracker provides an overview on the status of the actions, information on the due date, recent updates, links to related EU policies, links to relevant sources, and the main actors responsible for implementation. Currently, 62 out of 90 actions (69%) are marked as completed, 24 actions (27%) as in progress, and 4 actions (4%) as withdrawn. The Soil Strategy Actions Tracker provides a clear overview of the progress made by the European Commission and the EU Members States under the EU Soil Strategy for 2030.

The EU Soil Strategy Actions Tracker is the first step towards the EUSO Soil Policy Actions Tracker to monitor EU policy actions related to soils. This tracker will be a rolling assessment of progress on formal policy commitments on soil.

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<https://doi.org/doi/10.2777/821504>

List of abbreviations and definitions

Abbreviations	Definitions
DG	Directorate-General
DG ENV	Directorate-General for the Environment
ESDAC	European Soil Data Centre
EUSO	EU Soil Observatory
EU	European Union
JRC	Joint Research Centre
MS	Member State

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Annex 1. Database of the EU Soil Strategy Actions Tracker

This Annex describes the collated information based on the methodology described in Section 2 of the main report. Each section sub-section of the **Soil Strategy Actions Tracker** has a short summary based on the content of the [EU soil strategy for 2030](#) documentation (COM(2021)669).

The [EU soil strategy for 2030](#) sets out a framework and concrete measures to protect and restore soils, and ensure that soils are used sustainably. It sets a vision and objectives to achieve healthy soils by 2050, with concrete actions by 2030. The **Soil Strategy Actions Tracker** is designed to track the progress of these concrete measures and actions.

Ref	Short title	Action details	Due date	Status	Updates	Links to other policies	Relevant source	Main actor
1. Introduction								
<p>Soil and the multitude of organisms that live in it provide us with resources and regulate the water, carbon and nutrient cycles that make life on land possible. Yet, 60-70% of EU soils are unhealthy, facing one or more degradation pressures, such as erosion or organic matter decline¹. Soil degradation costs the EU tens of billions of euros annually² and threatens food security, necessitating government attention, public awareness, and investment in prevention and restoration. Healthy soils provide economic benefits as well as ecosystem services, aligning with the EU's climate, biodiversity, and long-term goals. Overall, the value of soil must be properly reflected in natural capital accounts such that our dependence on it becomes more apparent.</p> <p>It is important to avoid the risks and impacts that continued soil degradation will have on people's wellbeing and the economy. Therefore, soil deserves the utmost and urgent attention of public authorities at all levels as well as economic operators, soil users, local communities and citizens. The EU therefore required a comprehensive Soil Strategy to protect and restore soils while engaging society. The EU Soil Strategy involves a mix of voluntary and legally binding EU measures under the European Green Deal, respecting national policies of Member States.</p> <p>The Soil Strategy 2030 policy tracker provides a comprehensive overview on developments for each policy objective since the adoption of the Soil Strategy in 2021⁴.</p>								
2. Vision and objectives: Achieving good soil health by 2050								

2.1 Vision and objectives: Actions								
2.1.1	Adopting a Nature Restoration Regulation for ecosystem restoration proposal	The upcoming Commission proposal for a Nature Restoration Regulation (NRR) aims at restoring ecosystems to good condition by 2050	2021	completed	NRR enters into force (August 2024)	NRR timeline and text	DG ENV	
2.1.2	Develop and agree indicators and thresholds for soil health	Indicators for soil health and their range of values that should be achieved by 2050 to ensure good soil health need to be developed and agreed, and they should be considered at EU level in the context of the Soil Monitoring Resilience Directive (SMRD) to ensure a level playing field and a high level of environmental and health protection.	2023	completed	SMRD proposal: set of soil health descriptors and thresholds for some of them fixed at EU level	EC proposal for SMRD including the Impact Assessment	DG ENV	
2.1.3	Mandate the enlarged Soil Expert Group to develop indicators	Mandate the enlarged Soil Expert Group to develop indicators and thresholds	na	completed		Soil Monitoring and Resilience Directive (SMRD); Mission Soil	Details on the Commission Expert Group	DG ENV

3. Soil as a key solution for our big challenges

3.1 Soil for climate change mitigation and adaptation

Net carbon removals from the Land Use, Land Use Change and Forestry (LULUCF) sectors have decreased by 20% between 2013 and 2018⁵. Achieving net-zero GHG emissions by 2050 relies also on carbon removal through improved soil management. Sustainable practices in organic and mineral soils can help attain climate neutrality by reducing emissions and increasing carbon storage. For example, peatlands drainage, which allows organic layers rich in carbon to decompose, contributes to 5% of EU greenhouse gas emissions⁶. Mineral soils, storing less carbon, lose 7.4 million tonnes of carbon annually due to unsustainable practices⁷. Implementing sustainable management practices in both soil types can contribute significantly to climate change mitigation, with a potential to sequester between 11 to 38 Mt CO₂eq annually in Europe⁸.

3.1.1	Consider proposing legally binding objectives to limit drainage of organic soils and to restore peatlands	Based on the results of the impact assessment, consider proposing legally binding objectives in the context of the Nature Restoration Regulation (NRR), to limit drainage of wetlands and organic soils and to restore managed and drained peatlands	2021	Completed	NRR enters into force (August 2024)	NRR proposal stated that at least 30 % of the habitats not in good condition of Annex I of the Habitats Directive should be subject to restoration measures	NRR timeline and text	DG ENV
3.1.2	Contribute to the assessment of the state of peatlands	Contribute to the assessment of the state of peatlands in the context of the Global Peatland Initiative hosted by Food and Agriculture Organisation (FAO) and United	na	Completed	Publication of the Global Peatlands Assessment (2022)		Global Peatlands Assessment report	DG JRC

		Nations Environment Programme (UNEP)						
3.1.3	For mineral soils: enhance biodiversity in agricultural land to increase increasing soil organic carbon	For mineral soils, the European Commission (EC) proposes measures, possibly in the context of the Nature Restoration Regulation (NRR), to enhance biodiversity in agricultural land that would contribute to conserving and increasing soil organic carbon (SOC)	2021	Completed	Members of the European Parliament (MEP) adopt voluntary Carbon Removal Certification Framework (CRFC) (April 2024); Adoption of CRFC by Member States (MS) within Council is pending ; NRR enters into force (August 2024)	NRR includes a reference to the carbon stock under cropland in mineral soils; EU Climate Law	Press release from MEP on the CRFC; NRR timeline and text	DG ENV
3.1.4	Join the international initiative '4 per 1000'	The European Commission (EC) will join the international initiative '4 per 1000' to increase the soil carbon in agricultural land	na	In progress			4 per 1000 initiative website	DG JRC
3.1.5	Deliver a legislative proposal on carbon removal certification	The European Commission (EC) delivers a communication on restoring sustainable carbon cycles in 2021 and a legislative proposal on carbon removal certification in 2022	2022	Completed	Communication on Sustainable Carbon Cycles (COM(2021) 800 final) ; Legislative proposal	EU Climate Law	EC communication; Legislative proposal	DG CLIMA

		rewarding land managers for climate-friendly practices			(COM(2022) 672 final)			
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3.2. Soil and the circular economy

Soil plays a key role in a resource-efficient and circular economy, recycling water, carbon, and nutrients while filtering pollutants. Prioritizing circular land use over greenfield development minimizes pressures from soil sealing and land take. Most excavated soils are clean, fertile, and healthy and thus should be reused or recycled instead of landfilled. Out of the 53 million tonnes generated in 2018, 35 million tonnes has been recovered^{9,10}. Monitoring and separating contaminated soil from clean soil throughout the value chain is essential for a sustainable use of raw materials¹¹.

3.2.1	Investigate the streams of excavated soils	European Commission (EC) will investigate the streams of excavated soils generated, treated and reused in the European Union (EU) and benchmark the market situation in Member States by 2023	2023	Completed	EC report published on excavated soils. Peer-reviewed publication from Joint Research Centre (JRC); Soil Monitoring and Resilience Directive (SMRD) Impact Assessment has short paragraph with findings for the soil passport. The EC has awarded a contract to investigate streams of excavated soil in the EU and benchmark the market situation.		<u>'Excavated soil generation, treatment and reuse in the EU' report. Cristobal et al. 2024. SMRD Impact Assessment. Call for tender to support implementation of the Soil Strategy 2030</u>	DG ENV
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3.2.2	Assess the need and potential for a passport for excavated soil	The European Commission (EC) will assess the need and potential for legally binding provisions for a 'passport for excavated soil', and provide guidance to put in place such a system.	2023	Completed	Soil Monitoring Resilience Directive (SMRD) Impact assessment has short paragraph with findings for the soil passport (see target 3.2.1)	EU construction and demolition waste management protocol; Directive 2008/98/EC on waste (Waste Framework Directive)	Haas et al. 2020; SMRD Impact Assessment	DG ENV
3.2.3	Member States should set net land take reduction targets to 2030	Member States (MS) should set by 2023 their own ambitious national, regional and local targets to reduce net land take by 2030, and report on progress	2023	In progress (delayed)	Soil Monitoring Resilience Directive (SMRD) requires MS to implement soil monitoring schemes, including soil sealing, partially supported by the European Commission	SMRD 2050 target: zero net land take; Nature Restoration Regulation: no net loss of green urban spaces by 2030.	Member State input from the European Soil Expert Group	DG ENV
3.2.4	Member States should integrate the 'land take hierarchy' principles	Member States should integrate the 'land take hierarchy' into their Urban Greening Plans and give priority to reusing and recycling land and to quality urban soils at national, regional and local level, through appropriate	na	In progress	The European Commission provided technical guidance for Urban Greening plan (October 2022); Urban Green plan platform launched	Biodiversity Strategy	See also the Knowledge Centre for Biodiversity policy tracker from the Joint Research Centre	DG ENV

		regulatory initiatives and by phasing out financial incentives that would go against this hierarchy, such as local fiscal benefits for converting agricultural or natural land into built environment				Urban greening platform Member State input from the European Soil Expert Group	
3.2.5	Define net land take	The European Commission (EC) will provide a definition of net land take in the Soil Monitoring Resilience Directive (SMRD)	2023	Completed	Proposal for SMRD provides a definition of net land take	Nature Restoration Regulation: no net loss of green urban spaces by 2030.	SMRD Impact Assessment DG ENV
3.2.6	Consider provisions for Member States to report on progress in achieving land take targets	The European Commission (EC) will consider provisions for Member States (MS) to report on progress in achieving their land take targets	2023	Completed	Soil Monitoring Resilience Directive (SMRD) requires MS to implement soil monitoring schemes, including soil sealing, partially supported by the European Commission	SMRD 2050 target: zero net land take; Nature Restoration Regulation: no net loss of green urban spaces by 2030.	SMRD DG ENV
3.2.7	Consider options for monitoring	The European Commission (EC) will consider options for monitoring and reporting on	2023	Completed	Soil Monitoring Resilience Directive (SMRD) requires	SMRD 2050 target: zero net land take; Nature	SMRD DG ENV

	and reporting on progress towards the no net land take targets	progress towards the no net land take targets and the implementation of the land take hierarchy on the basis of the data reported by Member States (MS)			MS to implement soil monitoring schemes, including soil sealing, partially supported by the European Commission	<u>Restoration Regulation: no net loss of green urban spaces by 2030.</u>		
3.2.8	Revise the European Union Soil Sealing Guidelines	The European Commission (EC) will provide guidance on how to reduce soil sealing, with a revision of the European Union Soil Sealing Guidelines by 2024.	2024	In progress	European Environment Agency (EEA) working staff document available (October 2022)	<u>Biodiversity Strategy</u> <u>Soil Monitoring Resilience Directive: No net land take 2050</u> <u>Nature Restoration Regulation: no net loss of urban green spaces by 2030</u>	<u>Original Soil Sealing guidelines (2012)</u> <u>EEA report 'Guidelines on best practices to limit, mitigate or compensate soil sealing'</u>	DG ENV
3.2.9	Foster an exchange of best practices, in context of the revised European	The European Commission (EC) will foster an exchange of best practices, in context of the revised European Union (EU) Soil Sealing Guidelines, that successfully address the challenge of land take with a	2024	In progress	The EC has awarded a contract to develop guidance on how to reduce soil sealing and address land take,	<u>Biodiversity Strategy</u> <u>Soil Monitoring Resilience Directive: No net land take 2050</u>	<u>Original Soil Sealing guidelines (2012)</u> <u>EEA report 'Guidelines on best practices to limit, mitigate or</u>	DG ENV

	Union Soil Sealing Guidelines	view to developing a common methodology.			including through adequate spatial planning, taking stock of Member States experiences.	Nature Restoration Regulation: no net loss of urban green spaces by 2030	compensate soil sealing' Call for tender to support implementation of the Soil Strategy 2030	
3.2.10	Revise the Urban Wastewater Treatment Directive	The Commission will by 2022 revise the Urban Wastewater Treatment Directive and the list of surface water and groundwater pollutants.	2022	completed	The Council and the European Parliament came to a political agreement on a proposal to review the urban wastewater treatment directive (January and March 2024)		Legislative train of European Parliament; Council and Parliament provisional agreement on urban wastewater	DG ENV
3.2.11	Evaluate the Sewage Sludge Directive	The Commission will by 2022 evaluate the Sewage Sludge Directive	2022	Completed	The Sewage Sludge Directive was evaluated (2023)	New Circular Economy Action Plan	Evaluation of the Sewage Sludge Directive; Supporting information on the evaluation of the Sewage Sludge Directive	DG ENV

3.2.12	Adopt an Integrated Nutrient Management Action Plan	The Commission will by 2022 adopt an Integrated Nutrient Management Action Plan for a safer use of nutrients on soil.	2022	withdrawn	Public consultation closed (August 2022); proposal has not yet been put forward	Farm to Fork Strategy ; and the Biodiversity Strategy	Public consultation; State of Play Farm2Fork	DG ENV
3.2.13	Assess measures to achieve a reduction of nutrient losses by at least 50%	In the impact assessment for the Soil Health Law, the Commission will assess measures that can contribute to achieving the objective of the reduction of nutrient losses by at least 50% (resulting in the reduction of use of fertilisers by at least 20%), including the option of making this target legally binding.	2023	Completed	Measures that can contribute to achieving the objective of the 50% reduction of nutrient losses are included in the Impact assessment of the Soil Monitoring Resilience Directive (SMRD)	SMRD	SMRD Impact Assessment	DG ENV
3.2.14	finance a new LIFE project on high quality compost	Building on the obligation to collect organic waste separately, the Commission will seek to finance a new LIFE project that addresses as an ad hoc priority the use of high quality compost from biowaste on soil. The Commission will also continue funding research to address the environmentally sound	na	completed	Commission is funding the LIFE BIOBEST Project		LIFE BIOBEST projects	DG ENV

		recovery of organic fertilisers from bio-waste.						
3.2.15	Continue funding research to recover organic fertilizers from bio-waste	The European Commission (EC) will continue funding research to address the environmentally sound recovery of organic fertilizers from bio-waste.	na	completed	The EC is funding research projects, such as Bin2Bean and FENIX		Bin2Bean project ; FENIX project	DG RTD

3.3. Soil biodiversity for human, animal and plant health

Soil hosts an extensive range of organisms that can contribute to human health and ecosystem services. For example, since the discovery of penicillin from a soil fungus, antibiotics produced by soil microbes have saved millions of lives¹². Similarly, soil microorganisms can break down complex contaminants and maintain healthy forests by sharing nutrients and water¹³. However, soil biodiversity is threatened by land-use change, pollution, climate change, and invasive species. Data networks like the Farm Sustainability Data Network¹⁴ and LUCAS soil¹⁵ can increase knowledge on how land use change, overexploitation and other stressors impact soil organisms which allows for protection and preservation of soil organisms.

3.3.1	Publish an assessment of soil biodiversity in the European Union	Publishing by 2022 the first assessment of European Union (EU) soil biodiversity and antimicrobial resistance genes in agricultural soils under different management regimes (through the Land Use and Coverage Area frame Survey, LUCAS, soil component).	2022	completed	Peer-reviewed publications have been published based on the LUCAS 2018 biodiversity data	Biodiversity Strategy	Peer-reviewed publications: Labouyrie et al., 2023 , Königer et al., 2023 , Labouyrie et al., 2024 ; Published databases: DNA Bacteria and Fungi ; DNA	DG JRC
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						Eukaryotes; DNA Metagenomes	
3.3.2	Assess the risk of further alien flatworm species	The European Commission (EC) will assess the risk of further alien flatworm species for their potential inclusion in the list of 'invasive alien species of Union concern'	na	Completed	Updated list of invasive species (2022), including two species of flatworm <i>Bipalium kewense</i> and <i>Obama nungara</i>	Regulation on Invasive Alien Species; Nature Restoration Regulation: Limit invasive alien species; Biodiversity Strategy	EC report 'Study on invasive alien species' ; See also the Knowledge Centre for Biodiversity Actions Tracker from the Joint Research Centre
3.3.3	Strive for a global biodiversity framework	The European Commission (EC) will strive for better coherence and stronger synergies between the Rio Conventions and strive for a post-2020 global biodiversity framework that recognises the importance of soil biodiversity, strengthens the use of sustainable soil management practices to safeguard ecosystem services and integrates soil preservation and restoration in different targets and indicators	na	completed	The European Union is an official partner of the United Nations Framework Convention on Climate Change (UNFCCC) that led the Rio Convention initiatives. The European Union has contributed to the trust funds for participation as well as	UNFCCC party supplementary contributions; Global Biodiversity Framework	DG ENV

					supplementary activities over the period of 2020-2022			
3.3.4	Actively contribute to the adoption by the COP15 of the soil biodiversity agenda	The European Commission (EC) will actively contribute to the adoption of the two plans: i.) Plan of Action (2020-2030) for the International Initiative for the Conservation ii.) Sustainable Use of Soil Biodiversity. The two plans should be included in the 15th Convention of Parties (COP) and the Convention on Biological Diversity. Furthermore, the EC will support the implementation of these plans after their adoption.	na	Completed	COP 15 (December 2022) conference report includes sections on soil biodiversity and its conservation		<u>COP15 official publication</u>	DG ENV
3.3.5	Step up efforts in mapping, assessing, protecting and restoring	The European Commission (EC) will step up efforts in mapping, assessing, protecting and restoring soil biodiversity and support the establishment of the Global	na	completed	Study by the Joint Research Centre (JRC) to map soil biodiversity based on the Land Use and Coverage Area		<u>Official partners in GLOSOB</u>	DG JRC

	soil biodiversity	Soil Biodiversity Observatory (GLOSOB)			frame Survey (LUCAS) 2018 data in progress EC and JRC official are registered partners in GLOSOB			
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3.4. Soil for healthy water resources

Restoring soils' function to both filter and absorb water can boost clean water supply and reduce flood and drought risks. Coordinating water and soil policies can improve both soil- and aquatic ecosystem health. The Commission will address soil and water management integration and coordination, facilitate practice exchange, and publish guidance on sediment management. Member States should integrate soil and land use in river basin and flood risk management plans using nature-based solutions.

3.4.1	Consider addressing better coordination of soil and water management	The Commission will consider addressing the adequate integration and coordination of soil and water management, including in the impact assessment for a Soil Monitoring and Resilience Directive (SMRD)	2023	Completed	Water retention capacity and sustainable soil management principles linked to water resources included in the Impact assessment of the Soil Monitoring Resilience Directive	SMRD	<u>SMRD Impact Assessment</u>	DG ENV
3.4.2	Facilitate exchange of best practices on	The European Commission (EC) will facilitate exchange of practices among the Member States on the nexus between	na	completed		<u>Nature Restoration Regulation: restoration of</u>	<u>EC report on integrated sediment management in</u>	DG ENV

	the soil-water-sediment nexus	soil, water and sediment and publish a guidance on the sustainable management of sediment				marine ecosystems (including sediment bottoms); Water Framework Directive	context of the Water Framework Directive	
3.4.3	Better integrate soil and land use management in river basin and flood risks management plans	Member States (MS) should better integrate soil and land use management in their river basin and flood risk management plans where possible by deploying nature-based solutions	na	In progress	The sixth EC report on the implementation of river basin and flood risk management plans has been published (2021).	There is a mandatory update (every six years) of river basin and flood risk management plans as per the Water Framework Directive and Floods Directive implementation reports	Water Framework Directive and Floods Directive implementation reports	DG ENV

4. Preventing soil and land degradation and restoring healthy soils

4.1. Making sustainable soil management (SSM) the new normal

Sustainable soil management (SSM) practices maintain and restore soil health and its associated ecosystem services. While there is no universal SSM recipe, key sustainable practices include cover cropping, crop rotation, reduced tillage, and appropriate management of chemical inputs^{16, 17}. The European Commission aims to integrate sustainable soil use in EU policies and support agricultural advisory services. The new Common Agricultural Policy (CAP) introduces enhanced conditionality for environmental protection and eco-schemes, encouraging sustainable soil practices¹⁸. Land users should know their soil characteristics for better management, inspiring the "Test Your Soil for Free" initiative. Promoting SSM requires collaboration among local, regional, national, and international actors in the food system. The Commission aims to formulate regulations that strengthen the integration and collaboration across actors the food value chain.

4.1.1	Requirements for the sustainable use of soil	The European Commission (EC) will assess requirements for the sustainable use of soil so that its capacity to deliver ecosystem services is not hampered, including the option of setting legal requirements.	2023	Completed	European Union Soil Observatory (EUSO) Dashboard on soil degradation Impact Assessment report that supports the proposal for a Soil Monitoring Resilience Directive (SMRD) refers to sustainable soil management practices in Annex III	EUROSTAT proposal to amend environmental ecosystem account modules ; Nature Restoration Regulation: guidance on a European Union (EU) methodology to map, assess and achieve good condition of ecosystems so that they can deliver benefits	EUSO soil Degradation Dashboard EC report 'EU-wide methodology to map and assess ecosystem condition' See also the Knowledge Centre for Biodiversity policy tracker from the Joint Research Centre SMRD Impact Assessment	DG ENV
4.1.2	Prepare a set of sustainable soil management practices	The European Commission (EC) will prepare a set of 'sustainable soil management' practices, adapted to the wide variability of soil ecosystems and types, and identify unsustainable soil management practices.	na	In progress	Impact Assessment report that supports the proposal for a Soil Monitoring Resilience Directive (SMRD) refers to sustainable soil management practices in Annex III		SMRD Impact Assessment Call for tender to support implementation of the Soil Strategy 2030	DG ENV

					III; the EC has awarded a contract to prepare a set of sustainable soil management practices.			
4.1.3	Help Member States to put in place the 'Test your soil for free'	The European Commission (EC) will provide assistance such that Member States put in place the 'Test your soil for free' at the appropriate administrative level.	na	In progress	The EC has awarded a contract to set up an informative technical document for Member States for setting up and launching the "Test your soil for free" initiative.	<u>Call for tender to support implementation of the Soil Strategy 2030</u>	DG ENV	
4.1.4	Build a network of excellence of practitioners	The European Commission (EC) will create with the Member States a network of excellence of practitioners, and an inclusive network of Sustainable Soil Management ambassadors, building on the work of Living Labs and Lighthouses of the Mission 'A Soil Deal for Europe'.	na	In progress	Three projects funded under the Soil Mission: PREPSOIL, NATIONONS, SOILL-Startup'; Four research calls funded under 2023 and 2024 work programme; The EC has awarded a contract to develop an inventory,	<u>European Network for Living Labs</u>	<u>Living labs and lighthouses under the Soil Mission; PREPSOIL, NATIONONS, SOILL-Startup; 2023 and 2024 work programme calls; Call for tender to support implementation</u>	DG ENV and DG AGRI

					charter and communication campaign relevant to a network of practitioners and sustainable soil management ambassadors		of the Soil Strategy 2030	
4.1.5	Promote sustainable soil and nutrient management solutions	The European Commission (EC) will promote sustainable soil and nutrient management solutions through voluntary commitments between actors in the food system under the European Union (EU) Code of Conduct on Responsible Food Businesses and Marketing practices	NA	Completed	Each year, the EU Code of Conduct Mapping study has been published Each year, major food business partners published their Code of Conduct	Code of Conduct is one of the 1 st deliverables of the Farm2Fork Strategy	Code of Conduct website and published reports	DG AGRI
4.1.6	Promote sustainable soil management under the EU Code of Conduct	Promote sustainable soil management through voluntary commitments between actors in the food system under the EU Code of Conduct on Responsible Food Businesses and Marketing practices	na	Completed	EU Code of Conduct for Responsible Food Business and Marketing Practices (June 2021)	Farm2Fork Strategy	EC publication 'EU Code of Conduct on responsible food business and marketing practices'	DG AGRI

4.1.7	Strengthening cooperation with the farming community	The European Commission (EC) will value outstanding achievements and innovative initiatives on sustainable soil management by strengthening cooperation with the farming community such as through the European Land Owners Soil Award (ELOSA)	na	Completed	Inaugural Organic awards took place (September 2022) 2024 ELOSA award has been granted (March 2024)	Organic Action plan	Organic awards; Press release on ELOSA award	DG ENV
4.1.8	Continue to support the Global Soil Partnership	The European Commission (EC) will continue to support the Global Soil Partnership (GSP) in promoting sustainable soil management worldwide.	na	Completed	Publication of the Soil Atlas of Asia as a joint deliverable between Joint Research Centre (JRC) and the United Nations Food and Agriculture Organisation (July 2023)		Official GSP partners; Soil Atlas of Asia	DG ENV
4.1.9	Propose a legislative framework for an European Union	The European Commission (EC) will propose by 2023 a legislative framework for an European Union sustainable food system, as indicated in the Farm to Fork Strategy	2023	Withdrawn	EC provided initial Impact Assessment, public consultation closed (July 2022)	Farm2Fork Strategy	Legislative train of the European Parliament; Public consultation	DG SANTE

	sustainable food system							
4.1.10	Member States should integrate soil sustainability under the Cohesion Policy	Member States (MS) should duly include conservation, restoration and sustainable use of soil in their programmes under the European Union (EU) Cohesion Policy the conservation, restoration and sustainable use of soil	na	In progress		<u>New Cohesion Policy; Soil Monitoring and Resilience Directive (SMRD)</u>	<u>New Cohesion Policy 2021-2027</u> Guidance on EU funding for healthy soils in the <u>SMRD proposal</u>	DG REGIO
4.1.11	Member States should ensure contribution of the CAP to enhancing soil health.	Member States should ensure the strong contribution of the Common Agricultural Policy (CAP) to maintaining and enhancing soil health through support of the European Commission (EC) in the CAP 2023-2027 reform.	na	In progress	EC report on 28 CAP Strategic Plans at a Glance (December 2022)	<u>CAP; Farm2Fork Strategy; Biodiversity Strategy</u>	<u>EC report '28 CAP Strategies at a glance'; CAP 2023-2027 reform and timeline</u> ; See also the <u>Knowledge Centre for Biodiversity Actions Tracker</u> from the Joint Research Centre	DG AGRI
4.1.12	Member States should set up the "Test your soil for free"	Member States should set up the "Test your soil for free" initiative at the appropriate administrative level.	Na	In progress	The EC has awarded a contract to set up an informative technical document		<u>Call for tender to support implementation</u>	DG ENV

	free" initiative				for Member States for setting up and launching the "Test your soil for free" initiative.		of the Soil Strategy 2030	
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4.2. Preventing desertification

The United Nations Convention to Combat Desertification (UNCCD) aims to combat desertification, land degradation, and drought, targeting land-degradation-neutrality as a UN Sustainable Development Goal¹⁹. Europe faces increasing drought conditions and desertification risks, impacting food security, biodiversity, and climate change²⁰. The European Court of Auditors concluded that the steps taken by the Commission and Member States to combat desertification lack coherence and a shared vision on achieving land-degradation neutrality by 2030²¹. Adapting to weather extremes requires sustainable soil management practices to reverse desertification trends, restore affected soils and make soils more resilient²⁰.

4.2.1	Establish a methodology to assess the extent of desertification in the EU	The European Commission (EC) will establish a methodology and relevant indicators, starting with the United Nations Convention to Combat Desertification (UNCCD)'s indicators, to assess the extent of desertification and land degradation in the European Union (EU)	na	In progress	The Joint Research Centre (JRC) works on response to the 2018 Court of Auditors report Publication of European soil threats dataset (April 2024) on the European Soil Data Centre (ESDAC)	UNCCD; Intergovernmental Panel on Climate Change	Court of Auditors report that outlines the request for an EU methodology; Publications on ESDAC on land degradation	DG ENV DG JRC
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4.2.2	Propose to declare the EU as affected by desertification under UNCCD	The European Commission (EC) will propose to Member States to declare the European Union affected by desertification under United Nations Convention to Combat Desertification (UNCCD) and continue to encourage Member States to participate in the United Nation's Land Degradation Neutrality (LDN) Target Setting Programme	na	completed	Press release of the Council on 14 October 2024	UNCCD	Press release of the Council	DG ENV
4.2.3	Publish regularly on the state of land degradation and desertification	The European Commission (EC) will publish information every five years about the state of land degradation and desertification in the European Union (EU)	na	In progress	European Union Soil Observatory (EUSO) Dashboard on soil degradation launched Publication of European soil threats dataset (April 2024) on the European Soil Data Centre (ESDAC)		EC page on land degradation and desertification; https://environment.ec.europa.eu/topics/soil-and-land/international-action_en EUSO Soil Degradation Dashboard ; Publications on ESDAC ; The state of soils in Europe report	DG ENV; DG JRC
4.2.4	Support key global	The European Commission (EC) will continue support to	na	Completed	EC is an official partner in the		Regreening Africa ; Great	DG ENV; DG INTPA

	initiatives on land degradation	key initiatives such as the Great Green Wall initiative, Regreening Africa, and aid on land/soil issues in development cooperation			Great Green Wall initiative and Regreening Africa HORIZON funded Soils4Africa		Green Wall initiative; Soils4Africa	
4.2.5	Member States should take measures to prevent and mitigate degradation	Member States (MS) should adopt, in line with the European Union (EU) climate adaptation strategy, appropriate long-term measures to prevent and mitigate degradation coupled with wider use of drought management plans and application of sustainable soil management	na	In progress	Ecologic has been contracted by European Commission to perform 'Stock-taking analysis and outlook of drought policies, planning and management in EU MS'	EU Adaptation Strategy	Ecologic project deliverable	DG CLIMA

4.3. Preventing soil pollution

Preventing soil pollution is the most effective and cost-efficient way for ensuring long-term soil health, with a focus on source prevention²², such as sustainable product design, waste management and nutrient recovery as well as efficient fertilizer and pesticide use²³. The EU has legislation to prevent hazardous substance emissions into the environment. However, data on chemical hazards, environmental fate, and exposure are often lacking. As a result, the risks these chemicals pose on soil quality and organisms is often lacking.

4.3.1	Revise the Directive on the Sustainable	The European Commission (EC) will revise the Directive on the Sustainable Use of Pesticides (SUP) by 2022	2022	Withdrawn	EC withdrawal decision published, in view of Parliament's rejection of the proposal and the	Farm2Fork; Biodiversity strategy for 2030	Legislative train and general overview of the SUP Directive	DG SANTE
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	Use of Pesticides				lack of progress in Council discussions (May 2024)			
4.3.2	Evaluate the Sewage Sludge Directive	The European Commission (EC) will evaluate the Sewage Sludge Directive by 2022	2022	Completed	Publication of EC evaluation of Council Directive 86/278/EEC (May 2023)	New Circular Economy Action Plan (CEAP)	EC evaluation; CEAP and description of EC evaluation of Sewage Sludge Directive	DG ENV
4.3.3	Improve consideration of soil quality under the "one substance one assessment" initiative	The European Commission (EC) will improve and harmonise the consideration of soil quality and soil biodiversity in European Union (EU) risk assessments for chemicals, food and feed additives, pesticides, fertilisers, etc. under the 'one substance one assessment' initiative	na	completed	Council adopted its mandate for future negotiations with the European Parliament on the three legislative proposals of the "one substance, one assessment" package (June 2024)	Chemical Strategy for Sustainability; Zero Pollution Action Plan Zero Pollution Action Plan, here	Proposal of the "one substance one assessment"; Council adoption of mandate; Legislative train on reallocation of EU technical and scientific work on chemicals to EU agencies (REFIT)	DG ENV
4.3.4	Restrict intentionally used micro-plastics	The European Commission (EC) will restrict intentionally used micro-plastics under the Registration, Evaluation, Authorisation and Restriction	2022	Completed	EC adopted the proposal from the European Chemicals Agency (ECHA) on	Chemical Strategy for Sustainability;	ECHA website providing timeline for restriction of intentionally	DG GROW

		of Chemicals (REACH) Regulation			restricting microplastic products placed on the European Economic Area (EEA) market (Sept. 2023)	Zero Pollution Action Plan	added microplastics	
4.3.5	Restrict non-essential use of PFAS	The European Commission (EC) will prepare a restriction under the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) for all non-essential uses of the per- and polyfluoroalkyl substances (PFAS), preventing their emission to the environment including soil by 2022	2022	In progress (delayed)	European Chemicals Agency (ECHA) received consultation on the restriction proposal (Sept. 2023) Committee meetings planned until Sept. 2024, ECHA to deliver final opinions to EC afterwards	REACH; Chemical Strategy for Sustainability; Zero Pollution Action Plan	Timeline for the PFAS restriction proposal	DG GROW
4.3.6	Develop measures on the unintentional release of microplastics	The European Commission (EC) will develop measures on the unintentional release of microplastics by 2022.	2022	Completed	EURO 7 proposal (Nov. 2022) Proposal for a directive amending Directive 2008/98/EC on waste (July. 2023)	Plastics Strategy; New Circular Economy Action Plan; Ecodesign for Sustainable Products Regulation;	EURO 7 proposal press release; Waste directive revision proposal; Proposal regulation of construction products,	DG ENV

					Proposal for harmonised conditions for the marketing of construction products, amending Regulation (EU) 2019/1020 and repealing Regulation (EU) 305/2011	EU Strategy for Sustainable and Circular Textiles ; Tyre Labelling Regulation ; Construction Products Regulation ; Microplastics		
4.3.7	Develop a policy framework on bio-plastics	The European Commission (EC) will develop a policy framework on bio-based, biodegradable and compostable plastics by 2022.	2022	Completed	EC adopts communication on a policy framework for biobased, biodegradable and compostable plastics	New Circular Economy Action Plan ; Plastics Strategy	Envision EC policy framework: overview , timeline and proposal	DG ENV
4.3.8	Adopt biodegradability criteria for certain polymers	By July 2024, the European Commission (EC) will adopt biodegradability criteria for certain polymers, such as coating agents and agricultural mulch films under the European Union (EU) Fertilising Products Regulation	2024	completed	Consultation period on Draft act closed (April 2024) EC adoption planned for 2 nd quarter 2024 AIMPLAS was contracted by the EC to assess	EU Fertilising Products Regulation	EU Fertilizing Products Regulation amendments timeline ; AIMPLAS study	DG GROW

					biodegradability criteria for mulch films in soil and aquatic environments across the EU Commission delegated regulation amending regulation 2009/1009 adopted on 23/7 and currently under (3 month period) scrutiny			
4.3.9	Review contaminant limits for EU fertilising products	The contaminant limits for European Union (EU) fertilising products will be reviewed by July 2026 as part of the general review of that regulation.	2026	in progress		EU Fertilising Products Regulation, here	legislative train of European Parliament regarding the original 2016 proposal; The consolidated text and amendments since 2019	DG GROW
4.4. Restoring degraded soils and remediating contaminated sites								

Degraded soil can often be restored through sustainable management, but some cases require active restoration or risk management, depending on the extent of degradation. Member States have varying contamination legislation and reporting methods, leading the Commission to explore mandatory, uniform reporting in the Soil Monitoring Resilience Directive²⁴. National registers identifying and assessing risks for contaminated sites are needed also to fulfill EU commitments at a global level²⁵. The EU Commission is also revising the Environmental Crime Directive to enforce environmental policy for contaminated sites²⁶. While Member States develop national methodologies for assessing soil contamination risks, increased knowledge and collaboration are needed for emerging contaminants.

4.4.1	Consider legal provisions for making soil contamination reporting mandatory	Reporting on progress in managing soil contamination is currently voluntary, irregular and based on a changing methodology, different national definitions, screening values and risk assessment methodologies. In light of this lack of level playing field, the Commission will therefore explore the need for legal provisions to make such reporting mandatory and uniform across the EU in the context of the Soil Health Law.	2023	completed	Impact Assessment report that supports the proposal for a Soil Monitoring Resilience Directive (SMRD) refers to identification, registration, investigation and assessment of contaminated sites	SMRD	EC proposal for SML including the Impact Assessment	DG ENV
4.4.2	Revise the Environmental Crime Directive	The Commission is also working on a revision of the Environmental Crime Directive, which will propose an ambitious instrument to tackle environmental crime and introduce effective tools	na	completed	The new Environmental Crime Directive was adopted on 11 April 2024 and		Environmental Crime Directive	DG ENV

		for law enforcement authorities across the Union to enforce its environmental policy (including soil pollution offences), with the support of Eurojust in cross-border cases.			entered into force on 20 May 2024			
4.4.3	Consider legally binding provisions on contaminated sites identification, inventorization and remediation	The European Commission (EC) will consider proposing legally binding provisions to: i) identify contaminated sites, ii) set up an inventory and register of those sites and iii) remediate the sites that pose a significant risk to human health and the environment by 2050	2023	completed	<p>Content of register of potentially contaminated sites and contaminated sites was specified in Annex VII of the Soil Monitoring Resilience Directive (SMRD) proposal</p> <p>European Parliament (EP) adopted position on SMRD proposal (April 2024)</p> <p>European Council adopted position on SMRD (June 2024)</p>	Zero Pollution Action Plan ; United Nations 2030 agenda for sustainable development	Soil Monitoring and Resilience Directive (SMRD)	DG ENV

4.4.4	Assess the feasibility of a soil health certificate	The European Commission (EC) will assess the feasibility of the introduction of a soil health certificate for land transaction to provide land buyers with information on the key characteristics and health of the soils in the site they intend to purchase	2023	completed	Impact Assessment report that supports the proposal for a Soil Monitoring Resilience Directive (SMRD) includes the introduction of a soil health certificate	Soil Monitoring and Resilience Directive (SMRD)	EC proposal for SML including the Impact Assessment	DG ENV
4.4.5	Facilitate dialogues on risk assessment for soil contamination	The European Commission (EC) will facilitate a dialogue and knowledge exchange on the risk assessment methodologies for soil contamination and identify best practices	2022	In progress (delayed)	Soil Monitoring Law (SML) proposal specifies phases and requirement for site-specific risk assessment (Annex VI) European Parliament (EP) proposal and Council proposal of the SML amended Annex VI The EC has awarded a contract to review risk assessment methodologies and report the results from expert	Soil Monitoring and Resilience Directive (SMRD); EU Zero Pollution Action Plan; UN2030 agenda for sustainable development	Initial proposal of SMRD; Legislative proposal of EP in response to EC SMRD-text; Legislative proposal of Council in response to EP-SMRD text; Call for tender to support	DG ENV

					workshops in a technical assessment including recommendations.		<u>implementation of the Soil Strategy 2030</u>	
4.4.6	Develop an EU priority list for contaminants in soils	By 2024, the European Commission (EC) will develop an EU priority list for contaminants of major and/or emerging concern that pose significant risks for European soil quality, and for which vigilance and priority action at European and national level is needed	2024	In progress	Soil Monitoring and Resilience Directive (SMRD) proposal contains a reference to a soil pollution watch list		<u>Soil Monitoring and Resilience Directive (SMRD)</u>	DG ENV
4.4.7	Revise the Industrial Emissions Directive	By 2022, the European Commission (EC) will revise the Industrial Emissions Directive (IED)	2022	Completed	EC adoption of IED proposal for revisions (June 2022)	<u>Industrial Emissions Directive</u>	<u>Generic description</u> and <u>timeline</u> of IED	DG ENV
4.4.8	Evaluate the Environmental Liability Directive	Evaluate the Environmental Liability Directive, including with regard to the definition of land damage and the role of financial security by 2023	na	In progress	Public consultation period closed (Q2 2022)		<u>Evaluation of Environmental Liability Directive</u>	DG ENV

4.4.9	Member States should establish a system of soil health certificates	Member States should establish a system of soil health certificates for land transactions, if this is not included in the Soil Monitoring Resilience Directive (SMRD)	na	In progress	European Commission (EC) proposal for soil health certificates got deleted from Soil Monitoring Resilience Directive (SMRD) text in legislative proposal of European Parliament (EP) (April 2024)	Soil Monitoring and Resilience Directive (SMRD)	Legislative proposal of EP in response to EC SMRD-text	DG ENV
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5. We need to know more about soils

5.1. Soil and the digital agenda

Digital technologies offer new opportunities for monitoring soil conditions and degradation pressures. For example, the EU Copernicus earth observation systems provides data on bio-geophysical variables, as well as land cover and land use, supporting innovative soil research²⁷. The Commission seeks to leverage digital technologies in several strategies to advance soil monitoring by sensor technologies^{28, 29}. For example, improved broadband infrastructure to facilitate data transfer and real-time monitoring from field-based systems²⁸.

5.1.1	Create a Green Deal dataspace	Create a Green Deal dataspace: Access to soil research data will be made easier through the creation of a Green Deal dataspace and the implementation of the Horizon Europe Mission 'A Soil Deal for Europe'.	na	completed	Green Deal Dataspace launched The EU Soil Observatory (Joint Research Centre) and the SoilWise project are	A European Strategy for Data	Green Deal Dataspace; SoilWise Project	DG RTD, JRC
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					developing a data catalogue for soil data and outcomes of Mission Soil funded projects			
5.1.2	Enhance the use of digital tools	The European Commission (EC) will enhance the use of digital tools and Copernicus and rely on the Joint Research Centre (JRC) to further develop the European Soil Observatory (EUSO) and the European Environmental Agency (EEA) to develop the Land Information System for Europe (CLMS), supported by geospatial analytical products	na	In progress	<p>Land Use and Coverage Area frame Survey (LUCAS) Soil Survey 2022 completed, LUCAS Soil Survey expanded to 40.000 sampling locations; Call for tender</p> <p>Laboratory analysis of soil samples collected during the 2022 LUCAS Survey published (July 2024)</p> <p>JRC includes EEA layers on soil management practices in pilot</p>	<p>EUROSTAT links to LUCAS 2022;</p> <p>d'Andrimont et al. 2024;</p> <p>Call for tender for laboratory analysis of soil samples collected during the 2022 LUCAS Survey;</p> <p>CLMS news item on validation of high-resolution EEA layers</p>	<p>DG DEFIS</p> <p>DG JRC</p> <p>EEA</p>	

					studies for validation			
5.1.3	Support Member States to set-up farm sustainability tools for nutrients	The European Commission (EC) will encourage and support Member States to set-up farm sustainability tools for nutrients (FaST), as part of the farm advisory services under the new Common Agricultural Policy (CAP)	na	Completed	Release of v1.0.0 of FaST app (March 2021) Kick-off FaST stage 2 between EC and paying agencies (June 2021)	Common Agricultural Policy	FaST project timeline	DG AGRI
5.1.4	Improve the modelling capacity of soil-related processes in Destination Earth	The European Commission (EC) will improve the modelling capacity of soil-related processes under the Commission's Destination Earth in collaboration with the Horizon Europe Mission 'A Soil Deal for Europe'	na	In progress	All components of Destination Earth have been developed and launched (DestinE platform, Data Lake, Digital Twin Engine) (June 2024)	European data strategy	Generic overview of Destination Earth ; Project specific website of Destination Earth	DG CNECT
5.2. Soil data and monitoring								

Member State soil monitoring systems are fragmented³⁰, not harmonized across the EU and data are often not shared under the mechanisms of the INSPIRE Directive³¹. Equally, there is no systematic soil monitoring system in many Member States due to a lack of capacity or resources. The Commission's LUCAS soil monitoring scheme¹⁵ provides harmonized measurements but needs better integration with soil data collected across Member States and associated data flows³². An integrated EU-wide soil monitoring system will serve for reporting under several EU directives and regulations³¹,
^{33, 34}.

5.2.1	Consider provisions on monitoring and report on soils	The European Commission (EC) will consider provisions on monitoring soil and soil biodiversity and reporting on the condition of soil	2023	completed	<p>Soil Monitoring Resilience Directive (SMRD) proposal for increased monitoring within Member States next to the Land Use and Coverage Area frame Survey (LUCAS), soil module</p> <p>Call for tender Laboratory analysis of soil samples collected during the 2022 LUCAS Survey published (July 2024)</p>	<p>Initial proposal of SMRD;</p> <p>Legislative proposal of EP in response to EC SMRD-text;</p> <p>Legislative proposal of Council in response to EP-SMRD text;</p> <p>Call for tender for laboratory analysis of soil samples collected during the 2022 LUCAS Survey</p>	DG ENV
5.2.2	Provide a legal basis for the LUCAS soil survey	The European Commission (EC) will consider providing a legal basis for the Land Use and Coverage Area frame Survey (LUCAS) soil survey to legally anchor the objectives, conditions, funding, access to land, use of data and privacy issues	2023	completed	<p>Soil Monitoring and Resilience Directive (SMRD) specifies phases and requirement for site-specific risk assessment (Annex VI); European Parliament (EP) proposal and</p>	<p>EU Zero Pollution Action Plan;</p> <p>UN2030 agenda for sustainable development</p>	DG ENV

					Council proposal of the SMRD added text to Annex VI		response to EP-SMRD text;	
5.2.3	Provide EU-wide harmonized monitoring of soil organic carbon	The European Commission (EC) will provide through the Land Use and Coverage Area frame Survey (LUCAS) soil surveys EU-wide harmonised monitoring of the evolution in soil organic carbon content and carbon stocks, complementing Member States' reporting under the LULUCF Regulation	na	completed	Peer-reviewed publications have been published on soil organic carbon based on the LUCAS 2009, 2015 and 2018 data	Soil Monitoring and Resilience Directive (SMRD) , LULUCF Regulation , EU Climate Law	Peer-reviewed publication: De Rosa et al., 2023	JRC
5.2.4.	Work towards integrating a pollution module in the future LUCAS	The European Commission (EC) will work towards integrating a pollution module in the future LUCAS (Land Use and Coverage Area frame Survey) in 2022 soil survey to better understand and map the issue of diffuse soil contamination in the European Union (EU)	2022	Completed	Heavy metals, pesticides and other contaminants are integrated in the LUCAS 2022 soil survey. Call for tender for laboratory analysis of soil samples collected during the LUCAS 2022 soil survey published (Sept 2024)	Soil Monitoring and Resilience Directive (SMRD)	Call for tender for laboratory analysis of soil samples collected during the LUCAS 2022 soil survey	JRC

5.2.5	Produce a Clean Soil Outlook	The European Commission (EC) will produce a clean soil outlook as part of the integrated zero pollution monitoring and outlook framework	na	Completed	Publication of the Zero pollution outlook (July 2022)	EU Zero Pollution Action Plan	Zero pollution outlook Zero pollution outlook Zero pollution outlook Zero pollution outlook	DG ENV DG JRC
5.2.6	Identify soil monitoring gaps	The European Commission (EC) will identify knowledge gaps with regards to EU-wide soil monitoring, with the contribution of the European Joint Programme on agricultural soil management (EJP SOIL), in dialogue with Member States and other key stakeholders	na	Completed	Land Use and Coverage Area frame Survey (LUCAS) Soil Module 2022: new developments building on the activities of EJP SOIL Identification of gaps in current soil monitoring, included in deliverable 2.7 of EJP SOIL		EJP SOIL project ; Deliverable 2.7 of EJP SOIL	DG AGRI DG RTD DG JRC
5.2.7	Develop a soil dashboard	The European Commission (EC) will develop a soil dashboard with a set of reliable soil indicators	na	Completed	Publication of the first version of the EU Soil Observatory		EUSO Soil Degradation Dashboard	DG JRC

		integrating trends and foresight			(EUSO) Soil Degradation Dashboard (March 2023) Publication of the second version of the dashboard (June 2024)			
5.2.8	Develop an EU inventory of soil biota	The European Commission (EC) will develop an EU inventory of soil biota in order to monitor and better understand soil biodiversity	na	completed	Peer-reviewed publications have been published based on the Land Use and Coverage Area frame Survey (LUCAS), Soil Module 2018 biodiversity data Call for tender Laboratory analysis of soil samples collected during the 2022 LUCAS Survey published (July 2024)	Soil Monitoring and Resilience Directive (SMRD)	Peer-reviewed publication: Labouyrie et al., 2023 , Köninger et al., 2023 , Labouyrie et al., 2024 ; Call for tender Laboratory analysis of soil samples collected during the 2022 LUCAS Survey, here	DG JRC
5.3. Soil research and innovation								

The Horizon Europe framework supports knowledge creation, collaboration, and transition towards sustainable soil management. The Horizon Europe Mission 'A Soil Deal for Europe' creates a harmonized EU framework for soil monitoring, research-policy, and research-practice interfaces³⁵. The Mission Soil will address knowledge gaps and investigate as well as deploy solutions for sustainable soil management through 'living labs' and 'lighthouses', which are experimental farms and farms that showcase good practices.

5.3.1	Implement ambitious research roadmaps for soil	Through the Mission 'A Soil Deal for Europe', the EC will implement ambitious roadmaps for research and innovation to expand the knowledge base for soil stewardship and widen the access to and use of results from research activities	na	Completed	Roadmaps were developed under Mission Soil funded project SOLO. Project call HORIZON-MISS-2021-SOIL-02-01	Project call HORIZON-MISS-2021-SOIL-02-01 Mission Soil funded project SOLO	DG AGRI DG RTD
5.3.2	Provide funding to soil biodiversity, degradation and decontamination	The European Commission (EC) will continue providing substantial funding to i) research solutions to increase soil biodiversity; ii) address soil degradation; iii) pilot innovative technologies for decontamination	na	Completed	Research calls under Mission soil in 2021, 2022, 2023 and 2024	Research calls under Mission Soil	DG AGRI DG RTD
5.3.3	Promote development of digital solutions to assess soil quality	The European Commission (EC) will promote the development and use of digital and remote sensors, apps and handheld samplers to assess soil quality,	na	Completed	Research calls under Mission Soil in 2021, 2022, 2023 and 2024 Published as annex of the Proposal for	Digital Agenda for Europe Research calls under Mission Soil	DG AGRI DG RTD

		contributing to a ‘Digital Agenda for Europe’.			a Directive on Soil Monitoring and Resilience (SWD/2023/423 final) (July 2023)			
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6. Enabling the transition to healthy soils

6.1. Private finance and EU funding

Actors across the food value chain depend on healthy soils, and various stakeholders are taking action to address soil degradation and support sustainability. For example, investors and banks offer farmers lower interest rates when their soil is healthy³⁶. Companies can offset emissions by buying carbon credits from farmers³⁷. EU funding sources, such as the Common Agricultural Policy¹⁸ and Cohesion Policy³⁸, also support sustainable soil use and restoration. The Commission will engage with public, private, and financial sectors to enhance financing soil degradation prevention and restoration efforts.

6.1.1	Set up a dialogue on financing soil degradation prevention and soil health restoration	The Commission will set up a dialogue with the public, private and financial sector to see how financing the prevention of soil degradation and the restoration of soil health can be improved.	na	Completed	The Commission has awarded a contract to organize an online workshop on ‘Financing Soil Protection and Restoration’, which took place in October 2024.	<u>Recording of the workshop;</u> <u>Call for tender to support implementation of the Soil Strategy 2030</u>	DG ENV
6.1.2	Publish a guide with an overview of EU	The European Commission (EC) will publish a guide in 2022 with an overview of EU funding opportunities	2022	Completed	The EC has awarded a contract to create a guide that details all	<u>Soil Monitoring and Resilience Directive (SMRD)</u> <u>Guidance on EU funding</u>	DG ENV

	funding opportunities for soil	available for the protection, sustainable management and restoration of soils, once all priorities and focus areas for 2021-2027 have been clearly defined			available EU funding opportunities relevant for the protection, sustainable management and restoration of soils. The guide was published as annex of the Proposal for a Directive on Soil Monitoring and Resilience (SWD/2023/423 final) (July 2023)		<u>opportunities for healthy soils;</u> <u>Call for tender to support implementation of the Soil Strategy 2030</u>	
6.1.3	Use the EU Taxonomy Regulation to foster sustainable projects	The European Commission will promote investments in projects that sustainably manage and do not significantly harm soils under the European Union (EU) Taxonomy Regulation and its delegated acts	na	completed	Taxonomy regulation entered into force (July 2020) Delegated acts – Environmental and climate adopted (June 2023) JRC report on the definition of soil	<u>EU Taxonomy Regulation</u>	EU taxonomy for sustainable activities: <u>timeline</u> and <u>generic overview</u> ; Report <u>Soil fertility in the EU taxonomy</u>	DG ENV DG FISMA

					fertility in the EU taxonomy			
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6.2. Soil literacy and societal engagement

Soil is undervalued and often seen as an unlimited resource, with urban populations lacking awareness of its role in the sustainable bioeconomy. Therefore, education on soil's importance is needed, and stakeholders must have access general and specialized training. Formal education should be complemented with hands-on learning and best practice sharing. The Mission 'Soil Deal for Europe' aims to increase soil literacy by engaging citizens and food chain actors like farmers and retailers³⁵.

6.2.1	Launch a soil literacy initiative	The European Commission (EC) will launch a soil literacy engagement and awareness initiative, building on the successful example of the “ocean literacy”	na	Completed	Mission Soil Implementation Plan launched (Sept. 2021) Soil literacy included in the 2022 Soil Mission Call		Mission Soil Implementation Plan 2022 Soil Mission call	DG AGRI DG RTD
6.2.2	Facilitate sharing of information by EUSO portal and outreach networks	The European Commission (EC) will facilitate and encourage the sharing of best practices in communication and engagement on soil, building an European Soil Observatory (EUSO) portal and setting up outreach networks aiming at healthy soils	na	Completed	Mission Soil Implementation Plan launched (Sept. 2021) including thematic cluster on Communications & Stakeholder Engagement		Mission Soil Implementation Plan EUSO Annual Bulletin 2023 Example of relevant Mission Soil project: ECHO	DG AGRI DG RTD DG JRC

					Publication of EUSO Bulletin 2023 Research calls under Mission soil in 2021, 2022, 2023 and 2024, including calls on communication and engagement on soil			
6.2.3	Integrate soil degradation under the European common reference framework of sustainability competences	The European Commission (EC) will integrate the issue of soil degradation under the European common reference framework of sustainability competences, to develop the concept of soil literacy with European citizens	na	withdrawn	Soil degradation is indirectly addressed in the publication of “GreenComp, the European sustainability competence framework” (Jan. 2022) under the thematic ‘promote nature’. Soil degradation is not explicitly mentioned.		Link to the publication: The European sustainability competence framework (GreenComp)	DG EAC, EMPL

6.2.4	Communicate and educate about soil health	The European Commission (EC) will run a comprehensive portfolio of actions for communication, education, and citizen engagement to promote soil health at various levels and bring soils closer to citizen's values, building on the Mission 'A Soil Deal for Europe' and the EU Soil Observatory (EUSO)	na	Completed	<p>Report on the Communication and citizen engagement initiatives aligned with Mission Soil (August 2022)</p> <p>Launch of the Mission Soil Manifesto (April 2023)</p> <p>Publication of EUSO annual bulletin (March 2024)</p> <p>Four research calls funded under 2023 and 2024 work programme</p>		Communication and citizen engagement initiatives in line with the Horizon Europe Mission A Soil Deal for Europe Mission Soil Manifesto Link to living labs and lighthouses under the Soil Mission, here	DG AGRI DG JRC DG RTD
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7. Conclusions

7.1	Build the EU Coalition4HealthySoils as a new governance model	We need all stakeholders around the table to discuss and collaborate. Therefore, a new governance model based on a 'network of networks' and inspired by the Coalition4Oceans will be	na	In progress	The EC has awarded a contract to formulate actions that can establish and reinforce cooperation links		The C4HS task is described in the Call for tender to support implementation	DG ENV
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		created: the EU Coalition4HealthySoils (C4HS).			between stakeholders in relation to the implementation of the Soil Strategy		of the Soil Strategy 2030	
7.2	Enlarge the Soil Expert Group	The EU Soil Expert Group will be enlarged to include a balanced representation of stakeholders. Policy action will continue to be based on data and knowledge from the EU Soil Observatory and the EIONET National Reference Centre on Soil and the Mission 'A Soil Deal for Europe' .	na	Completed	Commission expert group for the Mission 'A Soil Deal for Europe' has been expanded in 2022.		details of the Soil Expert Group; EU Soil Observatory	DG ENV

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³ World Business Council for Sustainable Development (2018), The business case for investing in soil health

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⁶ [Setting up and implementing result-based carbon farming mechanisms in the EU - Publications Office of the EU](#)

⁷ [EUR-Lex - 52018DC0773 - EN - EUR-Lex](#)

⁸ Lugato et al. (2014), Potential carbon sequestration of European arable soils estimated by modelling a comprehensive set of management practices

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¹¹ [EU principles for sustainable raw materials](#)

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¹⁴ [Farm Sustainability Data Network](#)

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²⁰ EEA (2019), Climate change adaptation in the agriculture sector in Europe

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²⁵ UNEA-3 resolutions 3/4 on environment and health and 3/6 on managing soil pollution, the 2030 Agenda for Sustainable Development (SDG 3.9 and 15.3), the Minamata Convention (Article 12), the Stockholm Convention (Article 6), the Ostrava declaration of the 6th Ministerial Conference on Environment and Health.

²⁶ Directive 2004/35/CE on environmental liability with regards to the prevention and remedying of environmental damage

²⁷ [Copernicus Land Monitoring System \(CLMS\)](#)

²⁸ Farm to Fork Strategy, COM(2020)381

²⁹ [Zero Pollution Action Plan](#)

³⁰ [National monitoring systems - Inventory and Assessment of Soil Protection Policy Instruments in EU Member States - EC Extranet Wiki](#)

³¹ INSPIRE Directive 2007/2/EC.

³² See also EEA (2021), Soil monitoring in Europe - Indicators and thresholds for soil quality assessments <https://www.eea.europa.eu/publications/soil-monitoring-in-europe-indicators-and-thresholds>

³³ National Emissions Reduction Commitments Directive 2016/2284, Article 9

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³⁵ [EU Mission: A Soil Deal for Europe](#)

³⁶ [The Open Soil Index makes sustainability concrete - Careers at Rabobank - Rabobank](#)

³⁷ [Regenerative agriculture for food system resilience & climate action - Soil Capital](#)

³⁸ [Inforegio - Cohesion Policy](#)

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