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## **A deceiving transition from a Soil Health Law to a Directive for Soil Monitoring and Resilience**

Critical Analysis by the European Chapter of the Society for Ecological Restoration (SERE)

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### **Key messages**

- The European Commission has recently unveiled its Proposal for a Directive on Soil Monitoring and Resilience, aimed at addressing soil health, sustainable management, and remediation of contaminated sites. A critical review by SERE raises great concerns about the proposal's adequacy and effectiveness of its goals.
- Firstly, the change in the directive's name from "Soil Health Law" to "Soil Monitoring and Resilience Law" already suggests backtracking from the objectives to reverse soil health deterioration, especially given that up to 70% of EU soils are in poor health.
- The proposal does not go far beyond existing legislation and cannot be considered as making progress. By lack of ambition, it poses a risk to the EU's goal of achieving 100% healthy soils and zero soil pollution by 2050.
- The focus on soil monitoring, while important, may not adequately address all threats to healthy soil. Definitions of soil health and relevant descriptors are unclear, leading to potential variations in soil evaluations across the EU. It lacks effective legal instruments for all soil threats.

- Biodiversity in soil is overlooked, despite its importance. The proposal lacks descriptors for soil biodiversity, potentially hindering efforts to protect and restore it.
- Soil erosion and the monitoring of nitrogen and phosphorus are inadequately addressed, and the emphasis on remote sensing monitoring methods is premature.
- The proposal's approach to soil pollution mapping is unclear, leaving the selection of pollutants and their thresholds to the Member States' (MSs) discretion. This may result in geographical disparities in environmental and human health protection.
- Mitigating land take is not effectively addressed and the proposal fails to provide clear rules for soil management.
- Resource allocation and financial support for implementing the directive are unclear, raising questions about funding sources and mechanisms for soil health certification.
- The time frames envisaged for the implementation of the proposed actions are too long. Soil health assessment and implementation of protective and restorative measures is urgently needed.
- In summary, the European Commission's proposal, while a step in the right direction, requires further ambition and clarification to ensure the protection and restoration of soil health in the EU.

*The following critical analysis of the proposal adds detail to the above summary points.*

On July 5, 2023, the European Commission published its Proposal for a **Directive of the European Parliament and of the Council on Soil Monitoring and Resilience (Soil Monitoring Law)**. The intentions of the proposed Directive are to put in place measures for (a) monitoring and assessment of soil health, (b) sustainable soil management, and (c) soil restoration and remediation of contaminated sites. SERE recognises the fundamental importance of soils to ecosystems and society and welcomes a proposal that approaches soil protection and restoration coherently in line with the Biodiversity Strategy, related EU legislation (e.g. Birds and Habitats Directives, Water Framework Directive, Environmental Liability Directive), the Nature Restoration Law as well as the international obligations of the Rio Conventions and Sustainable Development Goal 15 and its target on land degradation neutrality.

*The proposal presents a low level of ambition*

A European "Soil Health Law" has been long-awaited. The evidence that 70% of the EU soils are in a poor state of health called for an organised common strategy at the European scale that should surpass the impact of soil protection if it were left entirely at the discretion of the MSs.

However, the change of the title of the proposed legislation (from "Soil Health" to "Soil Monitoring" Directive) has already signalled against the notion that this

initiative will be able to revert soil health deterioration in Europe and to protect soils against all threats.

As currently formulated, the Proposal fails to introduce an EU-wide legal framework for soil protection comparable to that enjoyed by air and water. The lack of ambition of the proposal puts at risk the goal of the EU Soil Strategy for 2030 to achieve 100% healthy soils and zero soil pollution by 2050. The prevailing feeling is that the Proposal falls short of asserting itself.

The Proposal does not go beyond the earlier draft of a Soil Framework Directive which was published in 2006 to implement the EU soil strategy of 2006 and which failed in the Environment Council and was subsequently withdrawn in 2014.

#### *Overreliance on existing or draft legislation*

The Proposal introduces the Directive as complementary to pre-existing soil relevant EU regulations (such as the Sewage Sludge Directive, the Nitrate Directive, the waste directives, etc.), although the Impact Assessment (Policy options, Table 5.3) recognises the inability of the current corpus juris to protect our soils.

There are frequent mentions of the “Nature Restoration Law”, but its current draft adopted by Parliament has been deprived of most of its capacity to protect soils by the abolition of Article 9 on the restoration of organic and mineral agricultural soils. Such soils cover about 40% of the EU area and show high levels of deterioration, including the highest erosion rates among all land use types (more than 25% of the EU agricultural soils are eroded). The current version of the Nature Restoration Law also limits the obligation to restore terrestrial degraded areas to those included in the Natura 2000 network (for comparison, Natura 2000 covers about 114 Mha and soil degradation by water erosion affects 92.5 Mha in Europe). Unfortunately, most of these eroded soils are not included in Natura 2000.

Another recurrently cited reference is Regulation 2023/839 amending Regulation (EU) 2018/841 about including the LULUCF sector in the evaluation of greenhouse gas balance, which demands considering atmospheric CO<sub>2</sub> removals by agricultural soils. While crucial for climate regulation, carbon sequestration in soils is just one of the environmental services that soil provides and just one soil function.

Finally, there is frequent reference to the Common Agricultural Policy (CAP), on which the LULUCF legislation<sup>1</sup> in turn delegates part of the responsibility for soil monitoring. Within the recently updated framework of the CAP, increased conditionality facilitates the adoption by farmers of some Agri-Environment and Climate Measures potentially (although not always) beneficial to soil, but integrated eco-schemes, that are much more promising for soil health recovery are often of dubious quality and voluntary for farmers. Such eco-schemes are being adopted with variable success by MSs. At the same time, the CAP keeps subsidising industrial agriculture, coupled with subsidies and other soil-damaging practices.

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<sup>1</sup> [Regulation \(EU\) 2023/839](#)

### *Room for manoeuvre granted to Member States increases risk*

The Proposal gives MSs excessive flexibility on how to achieve the objectives of the Directive and also aims to reduce costs through simplifying procedures and minimising administrative burdens. All these efforts are laudable up to a certain limit, given the wide range of land degradation situations and environmental consciousness across the EU. However, releasing all MSs from the obligation to submit integrative programs for soil health protection and restoration could be very dangerous given that several MSs lack coherent soil health protection plans (page 13 of the proposal).

Indeed, the proposal recognises that “some aspects of soil health are only marginally covered by EU legislation” and that coordinated action at the EU level is required. Despite this, majority of the important actions are treated in the proposal as recommendations to the MSs. We fear that the “flexibility” granted to MSs for designing their soil health plans will produce the same effect observed in the application of the CAP, in which subsidiarity in the redaction of national strategies is conducive to unbalanced actions across the EU. Moreover, leaving soil protection to the discretion of MSs that have systematically delayed acting for soil protection is at best a risky decision.

### *Soil monitoring as a starting position for protection and remediation action*

To achieve soil protection and regeneration in the long term, the Proposal takes a staged approach, with actions introduced in two phases, with soil monitoring and soil health and pollution assessment preceding protection and remediation actions.

Despite its alleged staged approach, all efforts of the Proposal are oriented toward monitoring soil characteristics and soil pollution. Due to the chaotic (and locally very deficient) state of soil databases in the EU, a unified framework for soil monitoring and soil health assessment will potentially be welcomed by administrations, scientists, land managers and restoration practitioners. Also, the intention to make all soil data available to relevant stakeholders is promising, and the envisaged **Soil Health Data Portal** will be an essential tool to foster soil protection and to increase the strength of Agricultural Knowledge and Innovation Systems across Europe.

However, as presented in the proposal, the monitoring framework shows important deficiencies.

First, crucial concepts are not correctly presented. In particular, the definition of “soil health”. In this sense, it is quite striking that ANNEX I lists “soil degradation” aspects instead of “soil health” aspects to be monitored. The reference point for soil protection legislation is usually to protect soil and its functions, especially the ecological ones. Here, as in the case of the Water Framework Directive, a soil condition is aimed at (“soil health”), but this objective remains unclear instead of concretely protecting the soil from further degradation.

In recent years, the scientific community has been struggling to define soil health and to propose soil health indicators based on easy-to-measure soil parameters that allow assessing soil health at a management scale. In the absence of general

agreement, allowing extensive freedom of choice to MSs to interpret soil degradation aspects and to settle thresholds for soil conditions can produce heterogeneous soil evaluations throughout the EU. A more accurate definition of soil health (i.e., by clarifying which trade-offs are acceptable between environmental services provided by soil) and its more adequate descriptors might help.

Accordingly, soil descriptors proposed in Part A of the same annex inform on soil degradation instead of on soil health. Moreover, important soil properties that inform about soil resilience to degradation (such as soil structure), or about soil capacity to mitigate climate change (such as the recalcitrance of soil organic carbon) are not addressed. On the other hand, some of the proposed descriptors (in particular, the SOC/Clay ratio) have been recently contested for their narrow application range and low sensitiveness. Also, the method proposed to evaluate “soil capacity to retain water” is very confusing, because of changes in the measurement scale (from plot to watershed).

In the interests of clarity and to facilitate future developments, the concept “regeneration”, which refers to intentional activities in the Proposal, refers should be split into: “natural regeneration” and “managed regeneration”. This is of particular importance in order to include the regeneration of highly degraded old agricultural soils that occurs spontaneously following abandonment and that can eventually evolve into secondary forests.

Besides conceptual details, the proposed monitoring framework demands MSs to assess soil health in “soil districts” that are expected to become land action units (or specific work territories), each of which under a different competent authority for the implementation of the Directive. Given the great soil spatial heterogeneity, and since MSs will be free to define their own districts, there is a risk of an explosion of small soil districts, with the related risk of increasing costs and bureaucracy. It might be useful that the law proposes a 'typical' extension for each of these districts which could be a reference for the MSs.

Also, to assist in the preparation of the future Law, the methods of soil sampling and analysis (in Annex II) should be standardized among laboratories to guarantee comparability as most the proposed analyses are not trivial and different laboratories can produce very different assessment for the same soil.

### *Soil biodiversity is neglected*

Although soils are the most biodiverse habitat on Earth<sup>2</sup>, biodiversity is shockingly neglected in the proposal. Despite growing concern for the negative effect of the loss of biodiversity on soil health and soil environmental services, the proposal does not include a single descriptor of biodiversity. The only proposed ‘soil basal respiration’ is a measure of soil microbial activity and soil biological metabolism, with contrasting meanings depending on soil microbial biomass and composition. To make matters worse, MSs are invited, according to their wishes, to perform whatever analysis of soil microbial or soil invertebrate diversity they deem interesting, which will (certainly) preclude a consistent inventory of European soil

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<sup>2</sup> (Anthony et al. 2023, <https://doi.org/10.1073/pnas.2304663120>)

biodiversity. Up to now, soil biodiversity has been very poorly measured under the LUCAS framework. Only 885 samples have been assessed in Europe through metagenomics, which is a very limited method to assess soil biodiversity beyond microbiota. Therefore, an effort can be made to increase sampling density and to monitor diverse compartments of soil biodiversity (particularly soil invertebrates).

#### *Natural areas with high erosion rates*

Annex I identifies areas to be excluded from the soil erosion criterion as “Badlands and other unmanaged natural land areas, except if they represent a significant disaster risk”. These areas should be clearly defined and mapped across Europe, avoiding the risk to confound historical degradation with natural processes.

#### *Nitrogen and phosphorus are poorly covered*

Nitrogen is not correctly included in monitoring despite the key importance of nitrate leaching from soil at the Soil-Water nexus. Only total soil nitrogen is taken into account, without consideration of its chemical forms (i.e., nitrites, nitrates...) that determine the risk of water pollution. Atmospheric nitrogen deposition is an important driver for soil degradation (i.e., acidification and aluminium toxicity) with a huge negative impact on biodiversity, especially on sandy soils. Phosphorus and phosphate content is also not adequately included in monitoring despite its importance in the light of limited availability of phosphate sources and problems with phosphate saturation in many agricultural soils.

#### *Emphasis on remote sensing has limitations*

In general terms, there is too much emphasis in the proposal on remote sensing that is not yet developed as to allow accurate soil evaluation. COPERNICUS provides interesting information about soil water content, but there is not yet any remote sensing system able to assess, for example, the vertical distribution of soil properties which is crucial to estimate the residence time of carbon in soils. In this sense, soil sampling depth should be standardized to allow comparison between sites and over time.

#### *Uncoordinated approach to soil pollution*

Mapping soil pollution in the EU occupies specific articles in the proposal. Unfortunately, here the monitoring framework is also too demure, with clear indication only for metals. The selection of the organic contaminants to be included in monitoring is left to the choice of MSs as well as their permitted concentrations that are not regulated for the soils of the EU.

Again, the freedom of decision granted to MSs seems excessive when allowing them to define the pollutants’ “acceptable level for human health and the environment individually” (Article 15). Security levels are left at the mercy of acceptable cost-benefit estimates at the national level, thus creating geographical differences in the protection of human and environmental health. Art 15(2) also refers to 'local specificities', a term with no legal basis, which opens the door to any exception. In

this sense, the mentioned “risk-based approach” to deal with soil pollution should be clearly defined.

Although most measures must be taken at a regional level, it might be appropriate to establish a higher authority (European level) with the power to unify the measures to be adopted at lower decision levels and to impose sanctions in case of non-compliance with the Directive.

The register of contaminated and potentially contaminated sites is to be the main tool in the fight against soil pollution in Europe, especially if the register is to be kept up-to-date and available to EU examiners. Moreover, to impede the submission of unrealistic lists designed to keep some severely polluted areas out of the view of the EU authorities, in addition to the mandatory reports to the EU, oversight by an independent body of EU-wide organic inspectors should be considered.

Finally, the Proposal declares the intention of applying the 'polluter-pays' principle, which can usefully supplement soil pollution control and solution, and further details about this possibility will be welcome in the Directive.

#### *Limiting land take is a missed opportunity*

The Proposal fails to propose feasible alternatives to mitigate land take. In fact, meeting this objective might be beyond the scope of the Directive. Market forces, population dynamics and housing policies among other drivers greatly influence land-use structure. Promoting the inclusion of legally binding provisions on soil protection in land planning laws might be a more realistic option.

#### *Unclear requirements to the Member States*

Assessing soil health and soil pollution in the EU should constitute the preliminary in the proposal step on which the EU strategy for sustainable soil management, protection and rehabilitation was expected to build up. Regrettably, the Proposal is very far from meeting this goal. Instead of settling clear rules for soil management, Article 10 requires MSs to make an academic exercise to produce yet another document on “good practices” based on already existing knowledge and environmental laws. To make matters worse, MSs are required to inform of their advances in implementing of a long list of unrelated laws listed in Annex IV affecting soil. As mentioned in the first part of this document, the relegation of soil restoration to other existing -and even draft-sectoral laws creates uncertainty.

#### *Addressing soil degradation is urgent*

Article 10 of the Proposal establishes a 4-year period for MSs to define management practices to be implemented and to be avoided by soil managers. As the Proposal states, the situation of the EU soils is worsening, and action must be taken as soon as possible. Four years is too long a period, even more because most of these measures are known and widely accepted by the scientific community. A two-year period should be sufficient. In the same sense, the first soil health assessment should

be performed sooner than 5 years (or 5 years and 6 months) after the entry into force of the Directive, as proposed in Articles 9 and 18 of the Proposal.

### *Inadequate resource estimations*

Implementing soil monitoring and soil restoration at the EU scale requires major economic effort. Concerning soil health monitoring, the EC undertakes to contribute to a maximum of 20% of national samples (Annex II) but the costs of field sampling and analyses are not included in the financial part.

When designing the Directive, improving the cost-efficiency of restoring the loss of environmental services provided by soil has been given a priority. However, it is difficult to evaluate such efficiency in the absence of an accurate assessment of the resources required for this large-scale operation. Again, the Directive often relies on existing funding instruments of the EU (the “Soil Deal for Europe” Mission and its expected living labs and lighthouses, and again the CAP, among other).

To improve the economic feasibility of the proposed actions, effective legal instruments are needed, which the proposal fails to provide. It requires MSs to extend Soil Health certificates beyond those actions that are expected to be issued for carbon removals at the EU level, but responsibilities for the quality of the certification are unclear. Are MSs expected to create specific agencies for soil health certification? Or will they allow the free market to decide? It is important to note that this question has proven impact on the reliability of the credits concerning the environmental benefits they represent, and the characteristics of the carbon credit market can lead to improvements as well as to setbacks in soil health protection.

When considering the cost of all proposed actions, the published proposal states that after an “incomplete estimation” in the impact assessment, the successful implementation of the Directive will require funding at the EU, national and local levels, but no guidelines are provided apart from the need that MSs ensure public participation, in particular from soil managers, farmers and foresters. To get economic support, MSs will be required to set up a mechanism for a voluntary soil health certification. In this sense, the statement that the “Demand for soil analysis services will also grow, consolidating businesses and the position of specialised SMEs in the EU” should be carefully considered for its effects, since competence and elevated market prices for advice in managing credit schemes might discourage the engagement of farmers and land managers in soil monitoring and improvement. Credits for environmental services provided by healthy soils should be sustained by a solid governance framework.

In conclusion, it is very disappointing that the long-awaited Soil Health Law has not been tabled and instead, it was substituted by an incomplete Soil Monitoring Plan. The directive takes a first step in the right direction by building up soil monitoring capacities. But it falls short of expectations after the failure of the Soil Framework Directive of 2006, which was withdrawn in 2014. Effective legal instruments are still missing, and the directive doesn’t tackle all soil threats to prevent soils from further degradation which is desperately needed.