



Reordering the European ground – regrounding the European legal order?

Marie Petersmann 

LSE Law School, London, UK
Email: m.petersmann@lse.ac.uk

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Abstract

This contribution to the Symposium on *Ecosystem Restoration and EU Law* assesses the underground protection schemes suggested by the European Green Deal (EGD) for the European Union (EU). By addressing the overground bias that environmental laws and policies have traditionally suffered from, the analysis engages with the EU Soil Strategy for 2030, its ‘Mission “A Soil Deal for Europe”’, and the proposed 2023 Soil Monitoring Directive. The Article explores how and to what extent this agenda for the preservation and restoration of soils is legally reordering the European ground and, simultaneously, how and to what extent it is regrounding the European legal order.

Keywords: EU environmental law; European Green Deal; Soil Strategy for 2030; ecolaw

1. Introduction

The European Green Deal (EGD) for the European Union (EU) captures a significant part of contemporary progressive ecological imagination. Its adoption in 2019 triggered a wide range of initiatives and policies aimed at climate action and carbon neutrality, just transitions, green financing and biodiversity protection, notably the preservation and restoration of ‘healthy ecosystems’.¹ As a new ground of ecological action, the EGD emerges as a process of European legal reordering that envisions to reground the European project. As part of these policies, the EU Soil Strategy for 2030 was adopted in November 2021 to ‘reap the benefits of healthy soils for people, food, nature and climate’.² The attention paid to ‘healthy soils’ might well reconfigure a distinct understanding of the European ground or ‘land’: not one in which a ‘European identity’ is ‘deeply rooted’ – as invoked by Josep Borrell referring to it as a ‘garden’ to be protected from an invasion of Europe’s Others living in a ‘jungle’³ – but one that reckons with the vitality of its soils upon which human and nonhuman life depends.

Arguably, a reckoning with the vitality of soils could contribute to an emerging form of ‘ecolaw’, which ‘does not refer to the limited domain of human law that *governs* life and the Earth,

¹European Commission, The European Green Deal (EGD) <https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en> accessed 2 November 2023.

²EU Soil Strategy for 2030, COM (2021) 699. The EU Soil Strategy is a key deliverable of the broader EU Biodiversity Strategy for 2030, COM (2020) 380.

³European Diplomatic Academy: Opening remarks by High Representative Josep Borrell at the inauguration of the pilot programme’ (13 October 2022) <www.eeas.europa.eu/eeas/european-diplomatic-academy-opening-remarks-high-representative-josep-borrell-inauguration_en> accessed 2 November 2023. On the racist and fascist ideologies of ‘blood and soil’, where the latter is turned into a grounding for nationalist body politics, see S Engel-Di Mauro, *Ecology, Soils, and the Left: An Ecosocial Approach* (Palgrave Macmillan 2014).

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but rather to the unlimited domain of law that *emerges* from life and the Earth'.⁴ From this perspective, rather than governing the soils as an object of environmental law, the agency, vitality and normativity of soils – its minerals, living organisms, organic and inorganic matter such as gas and water – become constitutive of law or legal normativity itself. This understanding reconfigures the modernist view of human subjects as strictly autonomous from nonhuman objects of law.⁵ This reconfiguration would entail a shift from a modernist grounding of environmental law that treats soils as an object of governance detached from human existential living conditions, towards an ecological regrounding of the EU legal order by reattaching its citizens and institutions to the vitality of the soils upon whose quality their lives depend. How ecological predicaments are reconfiguring relations and redistributing agency between and across humans and nonhumans has largely been commented upon in the literature.⁶ But with the EU Soil Strategy comes another – much less commented on – development, namely that so far, environmental laws and policies have largely suffered from an overground bias with little attention paid to the protection of undergrounds. As the Society for the Protection of Underground Networks (SPUN) puts it: '[o]ur map of the world is half-blank, omitting the underground networks that stitch ecosystems together and do the heavy-lifting of carbon sequestration'.⁷ Indeed, soils have largely been treated as a 'taken-for-granted, invisible infrastructure for modern cities, agriculture, and markets, as raw matter or a resource separate from society and emerging only as its residue'.⁸

In this contribution to the Symposium, I explore how and to what extent the EU Soil Strategy, its 'Mission "A Soil Deal for Europe"', and the proposed 2023 Soil Monitoring Directive are tackling this overground bias by advocating for the protection of underground ecosystems through the preservation and restoration of soils. As the EU Soil Strategy puts it, its objective is to finally 'grant [. . .] the same attention to soil inhabitants as we do for above-ground biodiversity'.⁹ This objective aligns with the call voiced throughout the humanities to change the outlook to earthly conditions – if one wants to take contemporary ecological predicaments seriously – by shifting attention to the 'critical zones' that sustain life on Earth.¹⁰ The main question that

⁴M Davies, *EcoLaw: Legality, Life, and the Normativity of Nature* (Routledge 2022), at 2 (original emphases).

⁵As Davies specifies indeed: 'rather than expand legal subjectivity to animals and other natural objects, [ecolaw] position[s] law and normativity in general as *ontologically prior to the designation of subjects and objects*: everything becomes subject and object within plural normative relationships', *Ibid.* (emphasis added).

⁶See Davies, *Ibid.*; H Lindahl, 'Place-Holding the Future: Legal Ordering and Intergenerational Justice for More-than-Human Collectives' 10 (2021) *Rivista di Filosofia del Diritto* 313–30; A Grear et al (eds), *Posthuman Legalities: New Materialism and Law Beyond the Human* (Edward Elgar 2021); M-C Petersmann, 'Life Beyond the Law – From the "Living Constitution" to the "Constitution of the Living"' 82 (4) (2022) *Heidelberg Journal of International Law* 769–97; M-C Petersmann, 'Response-Abilities of Care for More-than-Human Worlds' 12 (2021) *Journal of Human Rights and the Environment* 102–24; M-C Petersmann, 'Sympoietic Thinking and Earth System Law: The Earth, Its Subjects and the Law' 9 (2021) *Earth System Governance* 100114.

⁷Society for the Protection of Underground Networks (SPUN) <www.spun.earth/> accessed 2 November 2023. On the dangers of a turn to soil mapping, see *infra* notes 51–3.

⁸M Tironi et al, 'Soil Theories: Relational, Decolonial, Inhuman' in JF Salazar et al (eds), *Thinking with Soils: Material Politics and Social Theory* (Bloomsbury Academic 2020) 15–38, at 17. This modernist, Cartesian separation from the soil echoes in Marx's early critique of the 'metabolic rift' as 'a material disruption of cyclical processes in natural metabolism under the regime of capital', whereby capitalist production 'provoke[s] an irreparable rift in the interdependent process of social metabolism and natural metabolism'. K Saitō, *Marx in the Anthropocene: Towards the Idea of Degrowth Communism* (Cambridge University Press 2022), at 24 and 119. Marx originally pinpointed this rift by observing how 'modern capitalist agriculture created a dangerous disruption in the metabolic cycle of soil nutrients', *Ibid.*, at 25. On how this 'metabolic rift' bears colonial roots, with empires and colonising nations 'externaliz[ing] their environmental burdens outside of their continental territories, transforming their peripheries into plantations', see also M Ferdinand, *Decolonial Ecology: Thinking from the Caribbean World* (Duke University Press 2022), at 43–4.

⁹EU Soil Strategy (n 2), at 25.

¹⁰The term 'critical zone' refers to 'the vital layer that involves all the complex interactions connecting rock, soil, water, air and living organisms that regulate life-sustaining resources. [It] enables all processes that make the terrestrial surface of the globe habitable for humans, plants, animals, fungi and their millions of diverse life forms'. JF Salazar et al, 'Thinking-with Soils: An Introduction' in JF Salazar et al. (n 8), 1–13, at 2. See also B Latour and P Weibel (eds), *Critical Zones: The Science and*

animates this Article is therefore the following: by legally reordering the European ground, are the EU Soil Strategy, its ‘Mission “A Soil Deal for Europe”’, and the proposed 2023 Soil Monitoring Directive also regrounding the European legal order? Are we, in other words, witnessing a shift from a pre-EGD legal order governing the ground as a base on which environmental issues take place, to a post-EGD legal order grounded in and emerging from metabolic relations between under- and overground ecosystem processes that are critical for the maintenance of liveable conditions? This question will be addressed in two steps. First, I examine how the EGD promises to re-order European environmental laws and policies through a holistic framework aimed at addressing the preservation and restoration of soils. Second, I explore how this agenda is falling short of its promises by reproducing structural limitations of soil governance anchored in a vision of soil monitoring based on procedural data accumulation on soil quality, rather than substantive and legally binding interventions aimed at regrounding EU citizens and institutions into the vitality of soils essential for biodiversity to thrive.

2. A legal reordering of the European Ground

The EGD for the EU and its citizens stresses the urgency to *preserve* and *restore* ‘healthy ecosystems’.¹¹ Arguably, a reversal of priorities is taking place, with the EU moving away from prioritising the health of the economy and EU citizens, towards a prioritising of ecosystems’ health – or, in other words, a move away from a traditional understanding of ‘sustainable development’ towards an ‘ecological understanding of sustainability’ as the editor of this special issue Edoardo Chiti puts it.¹² As Chiti further noted elsewhere: ‘[a]lthough the health of ecosystems is instrumental to the health and economic life of human beings, it is not economic growth and the market that should be sustainable, but ecosystems’ themselves’.¹³ This paradigm shift also aligns with the ‘One Health’ approach, which invites EU agencies that have traditionally dealt with aspects of human, terrestrial and aquatic animal, plant and ecosystem health in silos, to recognise the entanglements between human, animal, plant and ecosystem health.¹⁴ Accordingly, and to reflect this paradigm shift, the EU is undergoing a process of legislative reforms in areas such as biodiversity protection, food safety, land use, energy efficiency, renewable sources of energy and – most importantly for our purposes – soil conservation and reparation.

While various EU policies on water, waste, chemicals, industrial pollution prevention, nature protection, or pesticides have contributed to the protection of soils, there is as of today no explicit

Politics of Landing on Earth (MIT Press 2020). The adjective ‘critical’ has a dual sense by referring both to being in a ‘critical’ state of risked extinction, and being ‘critical’ or essential to biodiversity. A new genre that emphasises this critical role of soils as key for addressing anthropogenic ecological predicaments by tackling industrial agriculture is also emerging. See K Ohlson, *The Soil Will Save us: How Scientists, Farmers, and Foodies Are Healing the Soil to Save the Planet* (Rodale Books 2014); V Shiva, *Soil Not Oil: Environmental Justice in an Age of Climate Crisis* (South End Press 2008).

¹¹EGD (n 1).

¹²E Chiti, ‘Legal Changes: Ecosystems’ Health and the Redefinition of Sustainability in the Green Deal’ 3 (2024) *European Law Open*, at 8 (this special issue): ‘[c]rucially, ecosystems’ health is given priority over economic and social concerns: it is not insulated from such concerns, as it is presented as functional to the social and economic activities of human beings; but it is designed as a pre-condition for human activities, a goal which is important to achieve in order to have a number of socio-economic benefits’. Some see in such a shift of perspective a *re-valuation* of life and human-nonhuman relations which have, so far, been captured by a capitalist valuing process. As Buller puts it: ‘[r]ather than appraise our economy from the perspective of supporting life – recognising the ways in which our economic institutions and systems currently drive social and ecological crisis – instead we appraise life, and any action taken to protect it, in economic terms’. A Buller, *The Value of a Whale: On the Illusions of Green Capitalism* (Manchester University Press 2022), at 9–10.

¹³E Chiti, ‘Managing the Ecological Transition of the EU: The European Green Deal as a Regulatory Process’ 59 (2022) *Common Market Law Review* 19–48, at 35.

¹⁴S Bronzwaer et al, ‘One Health Collaboration with and among EU Agencies – Bridging Research and Policy’ 15 (2022) *One Health* 1–5. See also I Braverman (ed), *More-than-One Health: Humans, Animals, and the Environment Post-COVID* (Routledge 2023).

legal instrument – let alone a legally binding one – that is specifically devoted to the protection of soils. Aware of this regulatory black hole, back in 2002, the EU Commission issued its Communication ‘Towards a Thematic Strategy for Soil Protection’ aimed at overcoming this gap.¹⁵ This led to a ‘Proposal for a Directive establishing a framework for the protection of soil and amending Directive 2004/35/EC’ in 2006.¹⁶ The adoption of a Soil Protection Framework Directive, however, required majority vote and was rejected in the Environment Council in 2007 due to a blockage by Germany, France, the UK, the Netherlands, Austria and Italy, despite the European Parliament issuing a positive resolution agreeing on the need for a Soil Framework Directive.¹⁷ Whereas soil protection gained momentum over the past decade – with the United Nations (UN) declaring 2015 ‘International Year of Soils’¹⁸ – evidence on soil degradation kept emerging during the almost 20 years that passed since the proposal for an EU Soil Framework Directive failed.¹⁹ The EU Soil Strategy for 2030 adopted in 2021 took stock of this evidence and brought an ‘EU Soil Law’ back on the table of negotiation. ‘To reap the benefits of healthy soils for people, food, nature and climate’, the Commission held, ‘the EU needs a renewed Soil Strategy that sets out a framework and concrete measures for protecting, restoring and sustainably using soils’.²⁰ Bearing the haunting trace of its initial failure, this ‘renewed strategy’ is embedded in a more ambitious and holistic ecological agenda.

As the EU Soil Strategy for 2030 reckons: ‘[t]oo few know that the thin layer that lies below our feet holds our future’.²¹ Soils, and the multitude of organisms that live in it, are ‘what make life on land possible’.²² ‘It takes thousands of years to produce a few centimetres of this magic carpet’, the EU Soil Strategy puts forward.²³ Soils host more than 25 per cent of all biodiversity on the planet and are the foundation of the food chains nourishing all animals and sustaining overground biodiversity. This ‘fragile layer’ regulates all biogeochemical cycles essential for living organisms, including water, carbon, nitrogen, phosphorus and sulphur.²⁴ ‘Yet’, the EU Soil Strategy deplores, ‘our soils are suffering’.²⁵ It has indeed been estimated that 60 to 70 per cent of soils in the EU are ‘not healthy’.²⁶ To address the transboundary impacts of soil degradation, the EU Soil Strategy announced that the Commission would draft a legislative proposal by 2023 ‘for good soil health to be achieved across the EU by 2050’.²⁷ The mission is to equip the EU ‘with an adequate legal framework granting soil the same level of protection as water, marine environment and air’.²⁸ A ‘Soil Mission’ was foreseen as a key instrument – funded by the Horizon Europe programme for

¹⁵Towards a Thematic Strategy for Soil Protection, COM (2002) 179.

¹⁶Thematic Strategy for Soil Protection, COM (2006) 231.

¹⁷I Heuser, ‘Soil Governance in current European Union Law and in the European Green Deal’ 6 (2022) *Soil Security* 100053, at 5.

¹⁸United Nations (UN) declaring 2015 International Year of Soils, <www.ceh.ac.uk/international-year-soils-2015> accessed 2 November 2023. For this occasion, a ‘Revised World Soil Charter’ was endorsed, following its adoption in 1982 by the UN Food and Agriculture Organisation (FAO). ‘Release of the Revised World Soil Charter’, <www.fao.org/global-soil-partnership/resources/highlights/detail/en/c/330570> accessed 2 November 2023.

¹⁹Heuser (n 17), at 5.

²⁰EU Soil Strategy (n 2), at 3.

²¹*Ibid.*, at 1 (opening sentence).

²²*Ibid.*, at 1.

²³*Ibid.*

²⁴*Ibid.*

²⁵*Ibid.*

²⁶*Ibid.* The most prevalent types of soil degradation appear to be the loss of soil organic carbon (53 per cent), the loss of soil biodiversity (37 per cent), and the risk of peatland degradation (30 per cent).

²⁷*Ibid.*, at 4.

²⁸*Ibid.*, at 3–4. The need to grant soils the same level of protection than water, the marine environment and air resonates also with the call to recognise soils as a stand-alone ‘planetary boundary’. Indeed, soils are a ‘a master variable for regulating the critical Earth-system processes within the planetary boundaries framework, with no other single variable playing such a strategic role across a broad range of the Earth-system processes’. PM Kopittke et al, ‘The Role of Soil in Defining Planetary Boundaries and the Safe Operating Space for Humanity’ 146 (2021) *Environment International* 106245, at 7. See also CT

research and innovation – for the implementation of this framework, by creating a ‘network of “living labs” (experiments and innovation in a laboratory on the ground) and “lighthouses” (places showcasing good practices)’ that would ‘test, demonstrate and deploy solutions for soil health’.²⁹

In accordance with this objective, on 5 July 2023, the Commission adopted a 69-pages long proposal on a Soil Monitoring Directive, aiming to ‘address key soil threats in the EU, such as erosion, floods and landslides, loss of soil organic matter, salinisation, contamination, compaction, sealing, as well as loss of soil biodiversity’.³⁰ Rather than suggesting concrete legislative steps to tackle soil degradation, the Soil Monitoring Directive ‘puts in place a solid and coherent soil monitoring framework for all soils across the EU, which will address the current gap of knowledge on soils’ and offer a ‘comprehensive and harmonized data on soil health from soil monitoring’.³¹ To make the Soil Monitoring Directive operational, ‘soil health’ needs therefore to become *measurable*. Different from ‘soil quality’ – which focuses largely on chemical components and is mostly used to characterise the ‘status of soil to sustain crop productivity’ – ‘soil health’ is more holistic and is based on the recognition of ‘ecosystem services’ that soils provide.³² As defined in the EU Soil Strategy, soils are therefore considered ‘healthy’ when they are ‘in good chemical, biological and physical condition, and thus able to continuously provide as many ecosystem services as possible’.³³ The Soil Monitoring Directive further defines ‘ecosystem services’ as ‘indirect contributions of ecosystems to the economic, social, cultural and other benefits that people derive from those ecosystems’.³⁴

Taken together, the EU Soil Strategy for 2030, its ‘Mission “A Soil Deal for Europe”’, and the proposed 2023 Soil Monitoring Directive are legally reordering the European ground. By envisioning a holistic, comprehensive and, eventually, legally binding instrument on soil preservation and restoration, it is the very ground – in the dual sense of the EU’s land and its soils, but also its existential *raison d’être* to ensure conditions of habitability in the EU and beyond – that is being legally re-ordered or ordered anew to ‘have all soils in healthy condition by 2050’.³⁵ While this is the promised objective the Commission has set for itself, it remains to be seen whether and how it will ultimately be realised – an issue that depends on many variables, including the administrative implementation of future legislations. Yet how, and to what extent, is this legal reordering of the European ground, also regrounding the European legal order?

Kraamwinkel et al, ‘Planetary Limits to Soil Degradation’ 2 (2021) *Communications Earth & Environment* 249, arguing that soil degradation constitutes a key Earth system process that should be added to the planetary boundaries framework.

²⁹*Ibid.*, at 22. On the Horizon Europe Mission ‘A Soil Deal for Europe’, see section 5.3 of the EU Soil Strategy.

³⁰Proposal for a Directive of the European Parliament and of the Council on Soil Monitoring and Resilience (COM (2023) 416 final), 5.7.2023 [hereafter Soil Monitoring Directive].

³¹*Ibid.*, at 4.

³²WH van der Putten et al, ‘Soil Biodiversity Needs Policy without Borders: Soil Health Laws Should Account for Global Soil Connections’ 379 (2023) *Science* 6627, at 32. The Soil Monitoring Directive defines ‘soil health’ as ‘the physical, chemical and biological condition of the soil determining its capacity to function as a vital living system and to provide ecosystem services’. Soil Monitoring Directive, *Ibid.*, Art 3(4).

³³EU Soil Strategy (n 2), at 4. The ecosystem services that are listed include the services to ‘provide food and biomass production, including in agriculture and forestry’, to ‘absorb, store and filter water and transform nutrients and substances, thus protecting groundwater bodies’, to ‘provide the basis for life and biodiversity, including habitats, species and genes’, to ‘act as a carbon reservoir’, to ‘provide a physical platform and cultural services for humans and their activities’, to ‘act as a source of raw materials’, and finally to ‘constitute an archive of geological, geomorphological and archaeological heritage’.

³⁴Soil Monitoring Directive (n 30) Art 3(3). It also defines an ‘ecosystem’ as a ‘dynamic complex of plant, animal, and micro-organism communities and their non-living environment interacting as a functional unit’, *Ibid.*, Art 3(2).

³⁵Questions and Answers on a Directive on Soil Monitoring and Resilience’ <https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_3637> accessed 10 November 2023. On the existential framing of healthy soils, see how the EU Soil Strategy for 2030 starts by reckonings how ‘[s]oil and the multitude of organisms that live in it provide us with food, biomass and fibres, raw materials, regulate the water, carbon and nutrient cycles and *make life on land possible*’. EU Soil Strategy (n 2), at 1 (emphases added).

3. A regrounding of the European legal order?

The European ground is being legally reordered by raising attention to its underground life. Following an initial detachment of EU environmental law from its ground – by focusing mostly on the overground environment, yet treating it as an object of managerial governance rather than a complex multispecies entanglement of both living and non-living matter essential for any organism to remain alive – ‘healthy soils’ now appear as the ground on which human and nonhuman health depends.³⁶ As the European Commissioner for Environment, Ocean, and Fisheries Virginijus Sinkevičius announced during the presentation of the soil law proposal on 5 July 2023: ‘[w]e are filling a major legal gap to bring soil – together with air, water and the marine environment – under an EU legal act’.³⁷ If EU officials keep referring to the proposal as the new ‘European Soil Health Law’, its formal title as ‘Proposal for a Directive on Soil Monitoring and Resilience’ – in short: ‘Soil Monitoring Directive’ – indicates a shift in focus from substantive to procedural action, which has been deplored by many.

By way of illustration, the Green Member of the European Parliament (MEP) Martin Häusling pointed out how the proposal falls behind the initial ambition of giving soil a protected status similar to that of air or water. ‘The proposal that the Commission has presented today for a “Soil Monitoring Directive”’, Häusling complained, ‘has nothing to do with a “Soil Protection Law”, as was still announced by the Commission in its Soil Strategy’.³⁸ The proposal, indeed, fell short of expectations by not including legally binding targets or requiring mandatory plans, and no obligation for Member States to take substantive actions for soil health.³⁹ The contrast between the promises spelled out in the EU Soil Strategy and the result of the Soil Monitoring Directive are indeed striking.

The EU Soil Strategy was articulated in a sentimental register amplifying the ‘vital’ – even ‘magical’ – quality of soils.⁴⁰ It set forth a ‘vision for soil’ aimed at re-grounding, re-attaching and re-connecting EU citizens and institutions to the soil, by ‘bring[ing] soil closer to people’s lives’ and ‘develop[ing] the concept of soil literacy with European citizens’.⁴¹ It recognised how soils had so far been treated as ‘the most undervalued element of nature’, often perceived ‘just as “dirt” and as an unlimited natural resource’, deploring a ‘lack of emphasis in education of the importance of soil’.⁴² A distinctive affective grammar was used to reground European citizens and institutions. This ‘vision for soil’ was pitched through a thought-experiment, time travelling to 2050 when soil protection ‘has become the norm’.⁴³ The objectives were not set in the subjunctive form, but asserting in the present tense what will have been achieved in future: ‘[b]y 2050, all EU soil ecosystems are in healthy condition and are thus more resilient, which will require very decisive changes in this decade. By then, protection, sustainable use and restoration of soil has become the norm’.⁴⁴ The EU Soil Strategy also entailed a noticeable shift from a *territorial* to a *terrestrial* understanding of the land, by

³⁶See the opening sentence of the EU Soil Strategy: ‘[t]oo few know that the thin layer that lies below our feet holds our future’. EU Soil Strategy (n 2), at 1.

³⁷F Bassetti, ‘Unearthing Perspectives: The New European Soil Health Law’ (Foresight, 20 July 2023).

³⁸J Dahm, ‘Commission Tables First EU Soil Law, Slammed for “Lacking Ambition”’ (EurActive 5 July 2023).

³⁹*Ibid.*

⁴⁰EU Soil Strategy (n 2), at 1.

⁴¹*Ibid.*, 23–4. This ‘vision for soil’, which explicitly draws on the notion of ‘soil literacy’, align with the vast strand of eco-literature that invokes the emotional state of ‘being grounded’ as feeling (re-)connected to the natural world and living ecology. See eg AP Gumbs, *Undrowned: Black Feminist Lessons from Marine Mammals* (AK Press 2020); B Morizot, *Ways of Being Alive* (Polity Press 2020); H Rosa, *Resonance: A Sociology of our Relationship to the World* (Polity Press 2019); D Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Duke University Press 2016); AL Tsing, *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (Princeton University Press 2015).

⁴²*Ibid.*, at 23.

⁴³*Ibid.*, at 3.

⁴⁴*Ibid.* (emphases added). The same holds true for the Soil Monitoring Directive, which states that ‘by 2050 at the latest, people live well, within planetary boundaries in a well-being economy where nothing is wasted, growth is regenerative, the EU has achieved climate neutrality and has significantly reduced inequalities’. Soil Monitoring Directive (n 30), at 3. On the importance of soils for the ‘planetary boundaries’ framework, see above (n 28).

foregrounding the materiality and agency of soils. A growing interest in non-static, vertical and volumetric qualities of ‘terrestrial’ space explores relational processes across new heights and depths, from the atmosphere to the subterranean.⁴⁵ If a *territorial* thinking is limited to human affairs and politics – delineated by cartographic maps of territorial boundaries – a *terrestrial* thinking relates to ‘more-than-human’ and geo-political concerns, where human and nonhuman agencies are entangled in the (re)production of (un)liveable conditions on Earth.⁴⁶ Indeed, the EU Soil Strategy recognised ‘soil healing’ as a ‘matter of survival’ beyond the human species: ‘soil and the multitude of organisms that live in it provide us with food, biomass and fibres, raw materials, regulate the water, carbon and nutrient cycles and *make life on land possible*’.⁴⁷ The agency of soil organisms and their relational processes were posited as essential for biodiversity and biogeochemical cycles. This approach aligns with and speaks to contemporary re-conceptualisations of soil and its manifold entanglements with plants, fungi, bacteria and other forms of life as ‘matters of care’ and sites of ‘material politics’ – a ‘belowground three-dimensional living world’ that so far remained elusive in social theory, including law.⁴⁸

The Soil Monitoring Directive, in contrast, is framed in an overall highly technocratic, technoscientific and managerial vocabulary. Soil descriptions, indicators and management practices are foregrounded, with strategies and objectives for soil use, preservation and restoration falling into the background. While it recognises the ‘central factor’ of ‘sustainable management and action to regenerate soils’ to boost soil health, it includes no obligations to take action beyond monitoring soil health.⁴⁹ The focus lies on closely monitoring and mapping both the ‘quality’ and the ‘health’ of soils, to highlight the location and estimate the extent of soil degradation in the EU.⁵⁰ As mentioned above, the prevailing parlance of soils as ‘ecosystem services’ channels attention to the economic, social and cultural contributions and benefits that people derive from soils.⁵¹ This angle of analysis enacts a particular way of valuing soils for human purposes, which rests on notions of use-value (the non-monetary value derived from humans’ use of soils) and exchange-value (the monetary value ascribed to soils and their ecosystem services).⁵² Indeed, whereas invocations of the ability of soils to ‘produce food, increase our resilience to climate change, to extreme weather events, drought and floods and support our well-being’ refer to the use-value of soils,⁵³ the calculation of costs of soil degradation resulting from the loss of ecosystem services refers to their exchange-value. For instance, the Soil Monitoring Directive evaluated that ‘[t]he benefits of the initiative [on the implementation of measures for sustainable soil management and regeneration] were estimated at around EUR 74 billion per year’.⁵⁴ This economic calculus serves to incentivise stakeholders to protect and restore soils, not for the sake of ‘healthy soils’ as such, but of financial profitability in light of a cost-benefit analysis. Soils are here conducive for profits of an economic nature.

But mapping – and cartography more generally – have never been neutral instruments or tools of description of space. Soil mapping promotes particular conceptions of lands, making them amenable to specific projects of governance. As with any kind of knowledge enterprise, Kon Kam King and Granjou note, ‘soil mapping relies on a range of material and social “inscriptions” (Latour

⁴⁵M Usher, ‘Territory *Incognita*’ 44(6) (2019) *Progress in Human Geography* 1019–46, at 1024–35.

⁴⁶See Part V on the ‘Terrestrial’ in Latour and Weibel (n 10), at 224–71.

⁴⁷EU Soil Strategy (n 2), at 25 and 1 (emphases added).

⁴⁸Salazar et al. (n 10), at 1; A Krzywoszynska and G Marchesi, ‘Toward a Relational Materiality of Soils: Introduction’ 12 (1) (2020) *Environmental Humanities* 190–204; M Puig de la Bellacasa, *Matters of Care: Speculative Ethics in More Than Human Worlds* (University of Minnesota Press 2017).

⁴⁹Soil Monitoring Directive (n 30), at 1.

⁵⁰A new tool maps the state of soil health across Europe’ <https://joint-research-centre.ec.europa.eu/jrc-news-and-updates/new-tool-maps-state-soil-health-across-europe-2023-03-13_en> accessed 10 November 2023.

⁵¹See above (n 32–4), Soil Monitoring Directive (n 30) Art 3(3–4).

⁵²S Engel-Di Mauro and L Van Sant, ‘Soils and Commodification’ in Salazar et al (n 10) 56–69, at 57.

⁵³Soil Monitoring Directive (n 30), at 1.

⁵⁴*Ibid.*, at 12.

and “infrastructures” (Star), including soil maps and nomenclatures, soil samplings, measurement and analysis guidelines and tools, soil data and databases, and research institutions and organisations funding and fostering soil mapping’.⁵⁵ This understanding of what ‘soils’ are (and who ‘soil experts’ are) determines also what type of soil knowledge matters.⁵⁶ The re-approval on 16 November 2023 by the EU Commission to keep using the controversial herbicide glyphosate – a chemical developed in the 1970s under the brand-name ‘Roundup’ by the US company Monsanto, acquired by the German agrochemical company Bayer in 2018 – offers a timely example of such politics of expertise. Indeed, amid myriad studies showing how glyphosate is both carcinogenic and harmful to biodiversity, the EU Commission prioritised the economic interests of the farm sector by extending the sell and use of this chemical in the EU for another 10 years.⁵⁷ In doing so, it failed to recognise the complex ways in which glyphosate disrupts the soils and their productivity as much as human bodies and their reproductivity.⁵⁸ Evidently, there is no guarantee that more soil monitoring will ensure better soil preservation and restoration as long as competing interests between socio-ecological and financial concerns are not addressed politically. As it stands, the increasing recourse to soil monitoring and expertise risks amplifying the technoscientific ‘big-data vision’ and associated belief that producing ever-more environmental data is the best option to manage the environmental crisis.⁵⁹

Overall, with the Soil Monitoring Directive, soils emerge as a new mandatory layer in environmental monitoring, mapping and modelling – with the subsurface of the globe now rendered legible, visible and manageable. It remains, however, unclear as to how soils will be ‘brought closer to people’s lives’ and EU citizens turned into ‘soil literates’, as promised in the EU Soil Strategy.⁶⁰ It is, arguably, precisely ‘people’s lives’ that remain absent from the Soil Monitoring Directive. The ‘people’ listed in the Soil Monitoring Directive are essentially ‘public authorities and stakeholders in agriculture, forestry and industrial sectors’, and notably ‘farmers, foresters, land owners and local authorities’.⁶¹ While the EU Soil Strategy and Soil Monitoring Directive target different publics, both instruments disregard the agroecological collectives who today are actively cultivating distinct relations to the soils – communities who are ‘developing relational and reciprocal approaches with their habitats to be conscious of and, more importantly, minimize and close the extractive supply-webs by rehabilitating ecosystems’.⁶² Whereas the Soil Monitoring Directive mentions its protection granted to ‘socially and economically disadvantaged communities living on or close to contaminated sites’ by ‘ensur[ing] that soil contamination is reduced to levels no longer considered harmful to human health and the environment’,⁶³ it silences and invisibilises the collectives that are already actively working at resisting and reversing soil contamination today – be it through ZADs (*zones à défendre*) or re-generative collective actions of ecological soil reparation.⁶⁴

⁵⁵J Kon Kam King and C Granjou, ‘Mapping Soil, Loosing Ground? Politics of Soil Mapping’ in Salazar et al (n 10), at 39, in reference to B Latour, ‘Circulating Reference: Sampling the Soil in the Amazone Forest’ in *Pandora’s Hope: Essays on the Reality of Science Studies* (Harvard University Press 1999) 24–79; and S Leigh Star, ‘The Ethnography of Infrastructure’ 43 (3) (1999) *American Behavioural Scientist* 377–91.

⁵⁶*Ibid.*, at 48.

⁵⁷‘10 more years: Emmanuel Macron’s broken glyphosate promise’ (*Politico*, 16 November 2023).

⁵⁸See R Lacroix and DM Kurrasch, ‘Glyphosate Toxicity: *In vivo*, *In vitro*, and Epidemiological Evidence’ 192 (2) (2023) *Toxicological Sciences* 131–40.

⁵⁹On this rationale and vision, see A Leiter and M Petersmann, ‘Tech-Based Prototypes in Climate Governance: On Scalability, Replicability, and Representation’ 33 (2022) *Law and Critique* 319–33.

⁶⁰EU Soil Strategy (n 2), at 1, 3, and 23–4.

⁶¹Soil Monitoring Directive (n 30), at 15 and 25.

⁶²A Dunlap et al, ‘European Green Deal Necropolitics: Exploring “Green” Energy Transition, Degrowth & Infrastructural Colonization’ 9 (2022) *Political Geography* 102640, at 15.

⁶³Soil Monitoring Directive (n 30), at 14.

⁶⁴For an example of such collective action and politics of ecological repair, see also M Petersmann, ‘Becoming Common – Ecological Resistance, Refusal, Reparation’ in M Arvidsson and E Jones (eds), *International Law and Posthuman Theory* (Routledge 2023) 222–43; and D Papadopoulos, M Puig de la Bellacasa and M Tacchetti (eds), *Ecological Reparation: Repair, Remediation and Resurgence in Social and Environmental Conflict* (Bristol University Press 2023).

There is, therefore, a paradox in recognising soils as vital for human and ecological health more broadly – thereby echoing a framing typical of Anthropocenic narratives, where it is humanity as a whole and its imprint in ecological conditions that is selected as scale of engagement – and yet focusing only on a limited number of stakeholders when it comes to actual interlocutors: technocratic policy-makers, farmers, land-owners, and the like. This mismatch between the promise of the EU Soil Strategy to re-ground EU citizens and institutions through soil attentiveness and literacy, and the actual disconnection between the Soil Monitoring Directive and people’s lives, points to a lack of inclusion in terms of regulatory arrangements characteristic of a modernist grounding of environmental governance of soils, rather than an ecological reconfiguration of human-soils relations.

Taken together, these shortcomings show how the legal reordering of the European ground through the adoption of the EU Soil Strategy for 2030, its ‘Mission “A Soil Deal for Europe”’, and the proposed 2023 Soil Monitoring Directive, are currently far from regrounding the European legal order by reattaching EU citizens and institutions to the ecological conditions they are entangled with.

4. Conclusion

Soils are ‘the most undervalued element of nature’, often seen ‘just as “dirt” and as an unlimited natural resource’, the EU Soil Strategy for 2030 deplored.⁶⁵ In the social sciences and legal literature specifically, soils – as opposed to land, territory, or the environment more broadly – attracted little attention to date.⁶⁶ In contrast to the burgeoning literature on water, biodiversity or forest protection, a gap on ‘soil literacy’ in EU environmental law contributed to an overground bias in the field, to the detriment of underground life. The relative obscurity of soils in academic and public discourses stemmed both from a literal ‘invisibility’ of subterranean life – now overcome through promises of soil monitoring, mapping and modelling – but also from their often-overlooked role as the foundational material ‘infrastructure of social life’,⁶⁷ or what Puig de la Bellacasa calls ‘bioinfrastructure’.⁶⁸

A shift of attention to soils’ essential role for biodiversity is now emerging and has reached the negotiation table of EU lawmakers. In the poetic words of the EU Soil Strategy, we read: ‘[b]eneath our fields and our feet, an eclectic community of soil organisms toil day and night in a remarkable, coordinated effort that sustains life on Earth’.⁶⁹ Whereas the text of the EU Soil Strategy adopted in November 2021 was remarkable in its framing or grounding in a relational understanding of ‘soil-as-living’⁷⁰ – by recognising soils as a relational metabolic process formed by and through

⁶⁵EU Soil Strategy (n 2), at 23.

⁶⁶See eg I Braverman, N Blomley, D Delaney and A Kedar (eds), *The Expanding Spaces of Law: A Timely Legal Geography* (Stanford University Press 2014); A Philippopoulos-Mihalopoulos, *Spatial Justice Body, Lawscape, Atmosphere* (Routledge 2015); and T O’Donnell, DF Robinson and J Gillespie (eds), *Legal Geography: Perspectives and Methods* (Routledge 2020). Note that the turn to legal geography is also emerging in EU law. See F de Witte, ‘Here be Dragons: Legal Geography and EU Law’ 1 (2022) *European Law Open* 113. None of these texts, however, engages with soils.

⁶⁷Krzywoszyńska and Marchesi (n 48), at 191. The urge to make soils ‘visible’ triggers a problematic mode of ‘legibility’ that leaves no space for soils’ alterity, opacity, and excess. Yusoff therefore proposes a ‘radical nonrelationality’ as a mode of ‘recognition beyond “our” abilities to make nonhuman worlds intelligible’ – ‘a mode of relating that is indifferent to “us” and holds fast to that indifference’. See M Tironi, ‘Soil Refusal: Thinking Earthy Matters as Radical Alterity’ in Salazar et al. (n 10), 175–90, at 185, in reference to K Yusoff, ‘Insensible Worlds: Postrelational Ethics, Indeterminacy and the (K)nots of Relating’ 31 (2) (2013) *Environment and Planning D* 208–26, at 209. Imperceptibility and invisibility, Yusoff reminds us, are ‘the overwhelming condition of what biodiversity is’, since ‘some 86 per cent of the species on earth and 91 per cent of those in the ocean remain imperceptible’. *Ibid.* (original emphasis).

⁶⁸See M Puig de la Bellacasa, ‘Encountering Bioinfrastructure: Ecological Struggles and the Sciences of Soil’ 28 (1) (2014) *Social Epistemology* 26–40. Puig de la Bellacasa sees soil as ‘the “infrastructure” of our living ecologies on Earth—to which [she] refer[s] here as *bios* as a way to emphasise everyday living with nature, rather than a more existentialist and humanist vision of “Life” as a driving force. Approaching soil as infrastructure makes it appear as a highly lively entity’, at 32–3.

⁶⁹EU Soil Strategy (n 2), at 10.

⁷⁰Puig de la Bellacasa (n 68), at 27. As Puig de la Bellacasa maintains: this awakening to a relational and lively understanding of soils is new only to Western modern societies: ‘Others, notably Indigenous People around the world, have maintained

human and nonhuman intra-actions – the outcome reached in July 2023 with the proposal of the Soil Monitoring Directive disappointed many. While acknowledging the vital or ‘critical’ role of soil, the instrument reinscribes an understanding of it as a ‘governable, ownable, and controllable’ element.⁷¹ This technoscientific and technocratic understanding is embedded in an ‘eco-constructivist rationale’ that believes in humans’ ability to re-construct the environment, mend the ‘metabolic rift’ between humans and nature, and pilot the Earth away from socio-ecological disasters.⁷² Soils, from this perspective, become the ‘new frontier’ for eco-modernist intervention and ultimate salvation – principally by reversing climate change through soil carbon sequestration. At the core of this redemptive claim lies a depiction of soil carbon sequestration, regenerative land-management practices, and negative-emission technologies as ‘possessing an almost mystical power to “reverse climate change”’.⁷³ As I argued in this Article, this eco-modernist approach that underpins the Soil Monitoring Directive drives attention away from distinctive human-soil relations premised on care, as already practiced today by many agroecological collectives. Soil care is here understood as a ‘concrete work of maintenance, with *ethical* and *affective* implications, and as a vital *politics* in interdependent worlds’.⁷⁴ These three dimensions – of labor/work, affect/affections, and ethics/politics – of care, turn care into a ‘force distributed across a multiplicity of agencies and materials [that] supports our worlds as a thick mesh of relational obligations’.⁷⁵ It is in such material practices and sensibilities that attention should be driven to ‘bring soil closer to people’s lives’ and ‘develop the concept of soil literacy with European citizens’, as initially envisioned by the EU Soil Strategy for 2030.⁷⁶

Until then, the increased attention to soils thanks to the EU Soil Strategy for 2030, its ‘Mission “A Soil Deal for Europe”’, and the proposed 2023 Soil Monitoring Directive might well legally re-order the European ground, but a distinct mode of relating, knowing and engaging with soils will be needed to re-ground the European legal order. Only then, and to come back to Puig de la Bellacasa – with whom my interest in soils began – will ‘[c]hanges in ways of knowing involve changes in ways of living that may well transform the object of knowing itself, in our case, Earth’s soil, from object to kin’.⁷⁷ As it stands, while legal actions are taken to preserve and restore soils in the EU, the path adopted with the Soil Monitoring Directive leaves little space to re-build a common ground and repair the metabolic rifts between humans and soils.

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different relations to the soil in which liveliness is not absent even when they have suffered the effects of hegemonic agricultural practice’, *Ibid.*

⁷¹A Krzywoszynska, ‘Caring for Soil Life in the Anthropocene: The Role of Attentiveness in More-Than-Human Ethics’ 44 (2019) *Transactions of the Institute of British Geographers* 661–75, at 662.

⁷²F Neyrat, *The Unconstructable Earth: An Ecology of Separation* (Fordham University Press 2018), at 2. From an eco-constructivist perspective: ‘saving the planet can only mean one thing, and this is one of the leitmotifs of post-environmentalism: intervene even more – in other words: “creating and re-creating [the Earth] again and again for as long as humans inhabit it”’, at 85. On the concept of ‘metabolic rift’, see above (n 8).

⁷³M Kearnes and L Rickards, ‘Knowing Earth, Knowing Soil: Epistemological Work and the Political Aesthetics of Regenerative Agriculture’ in Salazar et al (n 10) 71–88, at 76.

⁷⁴Puig de la Bellacasa (n 48), at 5 (emphases added).

⁷⁵*Ibid.*, at 20.

⁷⁶EU Soil Strategy (n 2), 23–4.

⁷⁷Puig de la Bellacasa (n 68), at 38.

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