

Dear Members of the European Parliament,

We, **scientists and soil experts**, reach out to you in view of the **upcoming votes on the Soil Monitoring and Resilience Directive, in the European Parliament's ENVI Committee and Plenary**. Extensive groundwork and negotiations among EU institutions and all political groups led to a compromise deal for a **much needed first EU policy framework on soils**. The text was widely supported by the ENVI Committee in June this year, and [formally adopted by the Council](#) in September. **We ask the European Parliament to now adopt the Directive, as an obvious last step to formalise the reached agreement.**

We urgently need to protect and restore soils, for many reasons:

Soils host an exceptional complexity of life and functions

Soils are our most complex and diverse habitat, estimated to host at least 59% of earth's biodiversity: the majority of fungi, plants and at least half of bacteria live in soils. A gram of soil can host millions of organisms, or more. Many species spend part of their life cycle below ground, among which most wild bee species, which nest in soils. This incredible wealth of biodiversity translates into complex interactions and essential functions, of which many yet have to be fully unearthed. For example, plants are interconnected with a diversity of microorganisms, such as bacteria and fungi, together forming a specific, comprehensive system: the holobiont. These interactions ensure healthy plant growth, by fighting off pathogens, and improving nutrient availability and uptake. Healthy soils are vital for a variety of functions, such as water and air purification, water retention and storage, nutrient cycling, carbon sequestration, pest control, erosion prevention, plant growth, and the provision of food and medicines.

Soils are in a dire state

Soils have been deteriorating at an alarming rate. It is estimated that up to 70% of Europe's soil is degraded, and that soil degradation is even increasing, with severe detrimental impacts on biodiversity, water quality and availability, climate mitigation and adaptation, overall ecosystem resilience, agriculture, food production and human health. The EU Soil Observatory dashboard indicates that 62% of all soils and 89% of agricultural soils show signs of critical loss of functions.

As highlighted by the One Health approach, the health of soils and other habitats, animals, plants and humans are closely interconnected. Soil pollution undermines soil biodiversity, diminishes soils' and ecosystem's overall capacity to produce healthy food, and is linked to an increased risk for a variety of serious illnesses. Studies are increasingly uncovering the relationships between soil microbiota, and

the human gut, brain and overall human health. For example, pesticide mixtures, omnipresent in soils, have detrimental impacts on soil biodiversity, eroding a substantial part of global biodiversity and harming ecosystem and human health.

The majority of agricultural land suffers from excess nitrogen. Droughts and drainage are increasingly degrading our soils, including wetlands and peatlands, which are of essential importance. Yearly, erosion washes away 1 billion tonnes of soils, which will likely be increased by more frequent extreme weather events. Soil sealing takes several 100s of km² of EU land per year. Moreover, due to lack of monitoring and data and shortcomings in risk assessment, the impacts of soil degradation are very likely to be even more extensive than currently estimated.

To get ahead, we need to protect and restore what lies beneath

Living soils are the foundation of our landscapes, healthy ecosystem functioning, food security, water quality and availability, human health and overall subsistence. Most of what we drink, eat, wear, use and live in originates in soils. Healthy soils are key allies in climate change mitigation and adaptation. We can truly not afford not to protect and restore our soils. The costs of inaction far outweigh the costs of action.

We urgently need the EU Soil Directive as common ground

A common EU policy framework on soils is urgent and long overdue. Soil degradation is in many aspects a cross-border issue, and there is a pressing need for harmonised monitoring and transboundary cooperation on soil research, management, protection and restoration. A variety of stakeholders, including many scientists, have highlighted extensive **shortcomings** in the original proposal and the current compromise text, given the severe degradation of EU soils, and the urgent need to restore them. For example, many have underlined the high need for a more extensive and robust monitoring and assessment framework (e.g. for soil biodiversity and soil pollution), clear (intermediate) targets and ambitious, binding provisions on sustainable soil management, in order to actually protect and restore soils. However, despite these shortcomings, **the compromise text reached by EU institutions remains an absolutely essential, significant and very valuable step to:**

- Significantly increase comparable **soil monitoring and soil health assessment data** for common soil descriptors
- Increase **monitoring of pollutants such as pesticides, PFAS and other emerging contaminants**
- Contribute to **addressing important knowledge gaps**

- **Foster coordinated action to reverse soil degradation and restore soils, through cooperation among member states, supported by the Commission** in the form of common tools and methodologies, and facilitated exchange of best practices
- Improve **identification and management of contaminated sites, and mitigation of land-take**
- Foster **independent research-driven activities**
- Support capacity building, **services for land managers including access to impartial and independent science based advice**, information, training activities and capacity building, as well as operational resources, **to improve soil health and soil resilience**
- **Promote awareness** on the medium and long-term multiple benefits of practices which improve soil health and soil resilience, and the costs of practices detrimental to soil health
- **Ensure that information on suitable measures and practices to increase soil health and resilience are provided at local level**, based on the soil health assessment performed

Improved soil data, soil health assessment and overall EU cooperation on soils will help inform policy and management decisions, and will foster the urgently needed protection and restoration of our soils, for current and future generations. **For all the reasons above, we ask you to officially formalise the agreed compromise text, and lay, with the first EU policy framework on soil, the ground for better understanding, protection and restoration of Europe's soils.**

Thank you very much for your time and consideration,

Sincerely,

Carlos António Guerra - University of Coimbra - Soil Biodiversity, Ecosystem services

Eric Struyf - University of Antwerp - Ecosystem functionality

Enken Hassold - German Environment Agency - Biologist

Monica Farfan - German Centre for Integrative Biodiversity Research - Soil ecology

Hans Peter Arp - Norwegian Geotechnical Institute (NGI)/ Norwegian University of Science & Technology (NTNU) - Environmental Chemist

Kotschik, Pia - German Environment Agency - Ecotoxicologist

Elena De Rijk - University of Antwerp - Biological sciences

Lucilla Boito - University of Antwerp - Soil science and biodiversity conservation

Salvador Lladó Fernández - Universitat de Barcelona - Soil ecology

Ruurd Van Diggelen - University of Antwerp - Restoration ecologist

Manon Lamond - University of Antwerp - Bio-engineering

Martin Siedt - University of Bonn - Soil Ecotoxicology

Krista Peltoniemi - Natural Resources Institute Finland - research

Vera Silva - Wageningen University - Soil, pesticides

Cardinael Rémi - Cirad - Soil Science/Agronomy

Leonor Almeida - Universidade de Évora - Biologist

Davide Geneletti - University of Trento - Environmental planning

Fabio Volkmann - Climate Farmers, EARA - Engineer for Renewable Energies

Tim De Meulder - University of Antwerp - Ecology

Jakub Hofman - Masaryk University - Soil environmental chemistry and toxicology

Matteo Campioli - University of Antwerp - Plant ecology

Renaud Mathieu - Ecotox Centre (CH) - Soil biology and ecotoxicology

Ziad matar - Veridi technologies - Engineering

Cornelis A.M. van Gestel - Vrije Universiteit Amsterdam - Ecotoxicologist

Koen Oorts - ARCHE Consulting, Belgium - Soil ecotoxicologist

Micha Wehrli - Eawag - Soil ecotoxicology

Maria J. I. Briones - University of Vigo - Soil biologist/ecologist

Rajasekaran Murugan - BOKU University, Vienna AT - Soil ecology

Juliane Ackermann - UBA - Soil science

Jasper Roussard - University of Antwerp - Biology

Stefanie Siebert - European Compost Network ECN e.V. - Soil scientist

Machate Oliver - German Federal Environmental Agency - Regulation of chemicals

Bettina Hitzfeld - Federal Office for the Environment - Biologist

Justine Lejoly - NIOO - Soil ecologist

Korinna Ziegler - German Environment Agency - Biologist

Louveline Lepeule - Centre Ecotox - Ecotox sciences

Chiara Cortinovis - University of Trento - Ecological planning

Catarina Malheiro - University of Aveiro - Ecotoxicology

Benoit Ferrari - Swiss Centre for Applied Ecotoxicology - Biologist/Ecotoxicologist

Andre Heinrich - Justus Liebig University Giessen - Soil Chemistry, Soil Contamination with Pharmaceuticals

Paul Bodelier - Netherlands Institute of Ecology (NIOO-KNAW) - Microbial Ecology

Paul Luu - "4 per 1000" international Initiative - Agronomist and specialized in agroforestry

Kato De Clercq - University of Antwerp - Msc Biology: Climate Change Ecology

Happaert Kobe - University of Antwerp - Bio-science engineering / Wood anatomy

Kathrin Klehs - German Environment Agency - Ecotoxicology, chemistry

Solé Magali - German Environment Agency - Biologist

Kevin Noort - UK Centre for Ecology & Hydrology - Biology, Ecology, Pesticide researcher

Roger Holten - Norwegian Institute of Bioeconomy Research, NIBIO - Researcher in soil and plant sciences

Wenjie Zhao - Tianjin University of Science and Technology, Department of Chemical Engineering and Technology - Chemical Engineering and Technology

Tobias Lammel - University of Gothenburg - Ecotoxicology, Chemical Risk Assessor

Constantin Muraru - European Agroforestry Federation - Agroforestry

Samuel Bickel - Graz University of Technology - Soil science, soil microbiome, soil physics

Kristine De Schamphelaere - PAN Europe - Bioscience Engineering, Soil and Water Management

Roberta Farina - CREA-Council for agricultural research and economics - Soil scientist and agronomist

Ingrid Rijk - Örebro University - Soil ecology & ecotoxicology

Guusje Koorneef - NIOO-KNAW - Soil scientist

Emilia Hannula - Leiden University, Institute of Environmental Sciences - Soil ecologist

Leonardo Bassi - NIOO-KNAW - Biodiversity and soil ecology

Judith de Bree - MPZ - Ecology

Lisa Koorneef - Leiden University Medical Centre - Scientist

Henrik Barmentlo - Leiden University - Ecologist and Ecotoxicologist

Mélody Rousseau - NIOO-KNAW - Soil biodiversity and molecular ecology

Evalena Skalstad - Swedish Society for Nature Conservation - 40+ years in sustainable food and agriculture systems

Robin Guilmot - Wageningen university - Soil biology

Giulia Bongiorno - Wageningen University and Research - Soil biology

Herman van den Berg - Stichting Stimular - Advies

Esther de Groot - Stichting Stimular - Biologist

Anne Jacobs - Stichting Stimular - Consumer of biological / ecological food for 30 years; a farmer's daughter

Karolina Barcauskaite - Lithuanian Research Centre for Agriculture and Forestry - Soil chemistry/agronomy

Giles Ross - NIOO-KNAW - Soil Ecology

Wim van der Putten - Netherlands Institute of Ecology - Soil ecologist

Maria-Franca Dekkers - Wageningen University and Research | Plant Science Group
- Research on the effects of crop diversity and cover crops on soil health

Ciska Veen - NIOO-KNAW - Soil ecology

Merlijn Schram - NIOO-KNAW - Soil biodiversity

Gonzalo Pacheco - Wageningen University and Research - Soil ecology

Lea Eder - Wageningen University - Soil Chemistry and Soil Biology

Mayra Vazquez Martinez - UVIC-BETA - Biologist

Willem Ravensberg - IBMA - Biocontrol scientist

Salina de Graaf - University of Amsterdam - Biology, Ecology, Genetics

Wiebke Wilhelm - Wageningen University & Research - Soil Microbiology

Natalie Ferro Lozano - Wageningen University - Mycorrhizal symbiosis

Juliane Filser - University of Bremen, FB 02, Ecology - Decades of Research and Teaching Soil Ecology

Elise Hogeveen - NIOO-KNAW - Bachelor Life Sciences

Fabian Balk - Ecotoxcentre CH - Academic

Judit Pump - iASK - Environmental and consumer law

Fernando del Moral Torres - University of Almería - Soil science

Raúl Ortega Pérez - University of Almería - Soil science

Iustina Popescu - Geological Institute of Romania - Soil pollution

Idan Kopler - MIGAL Galilee Research Institute - Agro-ecology, Eco-hydrology

Miguel de Cara García - Andalusian Institute for Agricultural, Fisheries, Food and Organic Production Research and Training (IFAPA) Plant Pathology, soil microorganisms

Joris de Vente - Spanish Research Council (CSIC) - sustainable land management

Johannes Kisser - Rhizoscope L.P. - Chemical engineer

Alix Vidal - Soil Biology Group, Wur - Earthworms, Biogeochemical cycles

Mellany Klompe - Soil Heroes Foundation - regenerative agriculture (arable farmer)

Heribert Insam - BioTReaT GmbH - Soil microbiologist

Watté Jeroen - CultivAé SC - Innovation brokerage for Regenerative Agriculture and agroecology, innovations in soil health

Melpomeni Zoka - National Observatory of Athens - Natural Resources Management, Geoinformation

Paul Bodelier, Netherlands Institute of Ecology (NIOO-KNAW), Microbial Ecology

Åsgeir R. Almås, Norges Miljø- og Biovitenskapelige Universitet, Soil science and bio geochemistry

E.R. Jasper Wubs, Van Hall Larenstein University of Applied Sciences, Soil health and soil ecology

Paolo Di Lonardo, Wageningen University and Research, Soil biology, soil health
Sigrid Dassen, Applied University Van Hall Larenstein, Soil ecologist

Ursan Patrick, ARDS Livada, Long term mineralo-organic fertilization & liming experiments -63 years

Wafa Guiga, Le Cnam, Environment Science

Yavor Yordanov, National Soil Survey, Soil Survey, Soil mapping, GIS, Soil monitoring /acidification, salinisation, contamination/, ecosystem services

Shaswati Chowdhury, ZALF, Soil scientist

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Kathrin Leicht, Private Consultancy, Soil Chemist

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Paolo Martalò, Interalia Sa, Soil mapping, soil erosion, soil sealing

Lena Madden, Technological University Of The Shannon, Biotechnology, environmental engineering, soil science

Deborah Cornadó, NIOO-KNAW, Microbiology

Luzia Stalder, NIOO KNAW, Soil microbiome

Kika Lewak, Van Hall Larenstein University of Applied Sciences, Soil microorganisms and plant interactions

Jos Raaijmakers, Netherlands Institute of Ecology, Soil Microbiology

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Mark P. Zwart, Netherlands Institute of Ecology, Virus ecology

Benedikt Boppre, Utrecht University, Soil science, compost

Eiko Kuramae, Netherlands Institute of Ecology & Utrecht UNiversity, Microbial Ecologist

Marion Meima, NIOO-KNAW, Microbial and molecular techniques
Muhammad Rizaludin, Netherlands Institute of Ecology, Microbial Ecology, Chemical Ecology

Irene de Bruijn, Netherlands Institute of Ecology, Molecular microbiology of soil microbes

Teresa Nóvoa, Universidade de Évora, Environmental Anthropology

Denis Medinas, University of Évora, Biodiversity

Gabriel Rocha, Netherlands Institute of Ecology - NIOO-KNAW, Greenhouse gases fluxes, Microbiology

José Muñoz-Rojas, University of Évora (Portugal), Land Use/Landscape/Governance

Jose Ignacio Marín Guirao, Andalusian Institute of Agricultural and Fisheries Research Training (IFAPA) La Mojonera, Almería, Spain, Integrated management of soilborne diseases and soil microbiology

Jesús Rodrigo Comino, University of Granada, Soil geography and geomorphology

Dajana Radujkovic, University of Antwerp, Soil ecologist

Hartmut Koehler, University of Bremen, Soil Ecologist, soil biodiversity, restoration ecology

Nuno Guiomar, University of Évora - Mediterranean Institute for Agriculture, Environment and Development, Wildfire management

Mireia Marti, Swiss Federal Office for the Environment, Soil pollution

Sara Vicca, University of Antwerp, Soil carbon

Sophia Findeisen, University of Antwerp - Plants & Ecosystems research group, Soil microbes, soil restoration

Arne Iserbyt, Antwerp University, Ecology

Maria Rivera Méndez, Universidade de Evora, Land use management

Omar Flores, Universiteit Antwerpen, Soil food web modelling

Inez Vanhoutte, Climate educator, University of Antwerp

Chaithra Varambally, Save Soil (Conscious Planet initiative)

Ivan Janssens, Antwerp University, Ecosystem functioning, soil science

Hans Joosten, Greifswald University, Peatlands and Palaeoecology

Sabine Tischew, Anhalt University, Restoration Ecology, Vegetation and Landscape Sciences

Camiel Aggenbach, Paludosa Research, Soil, vegetation, hydro-ecology, biogeochemistry

Anita Kirmer, Anhalt University of Applied Sciences, Restoration Ecology

Wiktor Kotowski, University of Warsaw, Wetland ecology

Gudrun Schwilch, Federal Office for the Environment, Soil science & policy

Magnus Engwall, Örebro University, Environmental toxicology , Effect-based analysis of soil

Anne van Poecke, University of Antwerp, Plant ecology

Anna Clocchiatti, Netherlands Institute of Ecology (NIOO-KNAW) and Institute for Biodiversity and Ecosystem Dynamics (IBED), Soil ecology

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