

OPEN LETTER

Open letter: A global call to strengthen national soil biodiversity action through coordination and harmonization

OPEN LETTER TO POLICYMAKERS AT THE 27TH MEETING OF THE SUBSIDIARY BODY ON SCIENTIFIC, TECHNICAL AND TECHNOLOGICAL ADVICE (SBSTTA-27; PANAMÁ, 2025)

Soils are home to more than half of all terrestrial biodiversity (Anthony et al., 2023) and form the living foundation of terrestrial ecosystems (Wagg et al., 2014). Yet, soil biodiversity remains underrepresented in national biodiversity strategies, conservation targets, and monitoring frameworks of several countries on the five continents. Many of them do not have the capacity or need adjustment in order to start monitoring soil biodiversity (Brown et al., 2025). However, a growing number of countries (from the EU, Brazil, United States, Australia, China, India, and several others) are formally assessing soil biodiversity through innovative national monitoring programs (Brown et al., 2025).

To promote the sustainable use and conservation of soil biodiversity, the Food and Agriculture Organization (FAO) through the Global Soil Partnership (GSP) launched the International Network on Soil Biodiversity (NETSOB) during World Soil Day in 2021, as per the recommendation of the Global Symposium on Soil Biodiversity and the Convention on Biological Diversity (CBD, 2022). At COP15 in 2022, the Global Soil Biodiversity Observatory (GLOSOB) was established to begin addressing those gaps (Parnell, Brown, et al., 2025; Parnell, de Ruiter, et al., 2025) and help support countries in building capacity for monitoring, assessment and policy action. NETSOB Working Group 1 has been tasked with enabling national soil biodiversity assessments and harmonizing efforts across countries.

As scientists and stakeholders committed to soil stewardship, we (authors and signatories of this letter; Supporting Information) call on governments, agencies, and biodiversity actors to recognize the urgency of coordinated, science-based action. Soils and their biodiversity must be included in national biodiversity strategies and ecosystem restoration targets—not only for the sake of the species they contain (Anthony et al., 2023) but also for the essential ecosystem services they provide: water, nutrient, climate regulation, food production, carbon storage, and protection of cultural heritage (FAO et al., 2020).

On this basis, we urge the following coordinated commitments from countries and biodiversity actors:

- Use and adopt the GLOSOB framework to support national soil biodiversity assessments.
- Support harmonization of Standard Operating Procedures (SOPs) (e.g., FAO, 2024, for soil microbial biomass) across soil biodiversity initiatives (Guerra et al., 2021).
- Identify soil biodiversity and ecosystem function knowledge gaps through global (Guerra et al., 2020) and national (Marín et al., 2022) mapping, engaging national representatives to fill them.

Soil biodiversity remains one of the least systematically studied components of global biodiversity, largely invisible in policy agendas. Its decline, however, has visible and growing consequences: reduced crop yields, increased erosion, pest outbreaks, land degradation, and diminished carbon storage (Delgado-Baquerizo et al., 2020; Wagg et al., 2014). Such consequences put human, animal, and ecosystem health at great risk. A coordinated approach is urgently needed to enable national-level action.

The UN Decade on Ecosystem Restoration and the Kunming-Montreal Global Biodiversity Framework risk not having their goals and targets met without meaningful inclusion of soil biodiversity. The science is clear, the frameworks exist (CBD, 2022), and the need for action is urgent. Emphasizing the need for countries to engage now, both to contribute data and expertise, and to benefit from shared infrastructure, we call on:

- Policymakers to include soils and their biodiversity in national targets, monitoring, and reporting (Parnell, Brown, et al., 2025; Parnell, de Ruiter, et al., 2025).
- Scientists and national institutions to engage in harmonized assessments and data sharing, thorough frameworks like GLOSOB.
- Biodiversity initiatives to fund soil biodiversity monitoring and capacity building, especially in underrepresented regions.

KEYWORDS: harmonization, monitoring, SBSTTA, soil biodiversity, standard operating procedures

AUTHOR CONTRIBUTIONS

César Marín, Carlos Barreto, and Zoë Lindo led the initiative and wrote the first draft; Brajesh K. Singh, Peter C. de Ruiter, George

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G. Brown, Jeff Battigelli, Gian Luca Bagnara, Rosalina González, Carlos Guerra, Xin Sun, Tara Dirilgen, Jacob Ulzen, Giulio Malorgio, Luca Montanarella, Claudia Coleine, Leena Vilonen, and J. Jacob Parnell reviewed and edited a second version; and all 128 authors have read and agreed to the final content of the letter.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

There are no data associated with the paper.

- César Marín^{1,2} 
 Carlos Barreto³ 
 Brajesh K. Singh⁴ 
 Peter C. de Ruiter⁵
 George G. Brown^{6,7}
 Jeff Battigelli⁸ 
 Gian Luca Bagnara⁹ 
 Rosalina González¹⁰ 
 Carlos Guerra^{11,12} 
 Xin Sun^{13,14,15} 
 Tara Dirilgen^{16,17} 
 Jacob Ulzen¹⁸ 
 Giulio Malorgio¹⁹ 
 Luca Montanarella²⁰ 
 Claudia Coleine²¹
 Leena Vilonen^{12,22}
 J. Jacob Parnell²³ 
 Joseph Edwards²⁴
 Heba Alfares^{25,26}
 Gandhiv Kafle²⁷
 Nasradeen A. H. Gadallah²⁸
 Hannah Karuri²⁹
 Arindam Roy³⁰
 Edward Yeboah³¹
 Punyasloke Bhadury³⁰
 David Kothamasi³² 
 Niraj Agarwala³³
 Sukumar Debnath³⁴
 Thilina Surasinghe³⁵
 Frank Ashwood³⁶
 Tushar Kumar³⁷
 Pawan Kumar³⁸
 Samina Siddiqui³⁹
 Jane Gicheha⁴⁰
 Petr Heděnc⁴¹
 Rachid Sabbahi⁴²
 Jasper Wubs⁴³
 Zhuang Ge⁴⁴
 Andrey Zaitsev^{45,46}
 Loris Galli⁴⁷
 Sunil Mundra⁴⁸
- Prabavathy Vaiyapuri Ramalingam⁴⁹
 Kate Buckeridge⁵⁰
 Partha Pratim Chakravorty⁵¹
 Raquel Juan-Ovejero⁵²
 Tobias Pfungstl⁵³
 Samuel Eziuzor⁵⁴
 David Elliott⁵⁵
 Derrick Y. F. Lai⁵⁶
 Sören Thiele-Bruhn⁵⁷
 Guille Peguero⁵⁸
 Nandan Bhattacharyya⁵⁹
 Samuel Bonnett⁶⁰
 Isimemen Osemwegie⁶¹
 Davorka Hackenberger Kutuzović⁶²
 Israel Ikoyi⁶³
 Hamada Abdelrahman⁶⁴
 Antonietta La Terza⁶⁵
 Mourad Bendada⁶⁶
 Konstantin Gongalsky⁶⁷
 María Laura Moreno⁶⁸
 Daniel Blackburn⁶⁹
 Luís Carlos Lunes Oliveira Filho⁷⁰
 Stefano Taiti⁷¹
 Maria Fernanda Cordova Hernandez⁷²
 Leandro Fonseca de Souza⁷³ 
 Ingeborg Klarenberg⁷⁴
 Marta Novo⁷⁵
 Matthieu Chauvat^{76,77}
 Ana Ribeiro-Barros⁷⁸
 Kari E. Dunfield⁷⁹
 Giuliana Shelly Lizana Flores⁸⁰
 Sumit Rai⁸¹
 Shankar Ganapathi Shanmugam⁸²
 Brett Hale⁸³
 Dinesh Govindaraj Kamalam⁸⁴
 Luis Wall⁸⁵
 Maria J. I. Briones⁸⁶
 Ji-Zheng He⁸⁷
 Rakesh Kumar⁸⁸
 Reza Ghaderi⁸⁷
 Radhika Sharma^{89,90}
 María Gómez-Brandón⁹¹
 Muhammad Imtiaz Rashid⁹²
 Maria Pappas⁹³
 Louise Egerton-Warburton⁹⁴
 Katalin Szlavecz⁹⁵
 Luigimaria Borruso⁹⁶
 Giulia Bongiorno⁹⁷
 Christina Birnbaum⁹⁸
 Samson Mang'oka⁹⁹
 Raza Khan¹⁰⁰
 Chiara Alisi¹⁰¹
 Levan Mumladze¹⁰²
 Victoria Burton¹⁰³

- Nasir Bashir Naikoo¹⁰⁴
 Marc Dumont¹⁰⁵
 Lidia Oktaba¹⁰⁶
 Olaf Schmidt¹⁰⁷
 El Hassan Mayad¹⁰⁸
 Karin Jacobs¹⁰⁹
 Chidozie Ernest¹¹⁰
 Dhananjaya Bhakthanakatte Chandrappa¹¹¹
 Sol Santander-Mendoza¹¹²
 Lenin Medina-Orozco¹¹³
 Michael Schloter¹¹⁴
 Leigh Winowiecki¹¹⁵
 Erica Lumini¹¹⁶
 Cristina C. Bastias¹¹⁷
 Matthew Bakker¹¹⁸
 Laura Zucconi¹²¹
 Fabiana Canini¹¹⁹
 Maria Tsiafouli¹¹⁹
 Mohd Afzanizam Muda¹²⁰
 Sud Sair Sierra¹²¹
 Raul Hernando Posada¹²¹
 Carlo Jacomini¹²²
 Myo Thant¹²³
 Deborah A. Neher¹²⁴
 Anne Nurbaity¹²⁵
 Maika Daveta¹²⁶
 Robabeh Latif¹²⁷
 Atabak Roohi Aminjan¹²⁸
 Hilmar N. Thordarson¹²⁹
 Moussa Tady Diallo¹³⁰
 Becky Ball¹³¹
 Sina Adl¹³²
 Zoë Lindo^{12,133} 
- ¹⁴Zhejiang Key Laboratory of Urban Environment Processes and Pollution Control, CAS Haixi Industrial Technology Innovation Center in Beilun, Ningbo, China
¹⁵University of Chinese Academy of Sciences, Beijing, China
¹⁶Department of Biology, Maynooth University, Maynooth, Co. Kildare, Ireland
¹⁷Earth Institute, University College Dublin, Belfield, Dublin, Ireland
¹⁸Forest and Horticultural Crops Research Centre, University of Ghana, Accra, Ghana
¹⁹Department of Agricultural and Food Sciences, Alma Mater Studiorum - Università di Bologna, Bologna, Italy
²⁰Independent Researcher, Rome, Italy
²¹Department of Ecological and Biological Sciences, University of Tuscia, Viterbo, Italy
²²School of Global Environmental Sustainability, Colorado State University, Fort Collins, Colorado, USA
²³Biome Makers, Cary, North Carolina, USA
²⁴University of Tennessee, Knoxville, Tennessee, USA
²⁵Department of Agricultural Engineering, Faculty of Veterinary Medicine and Agricultural Engineering, An-Najah National University, Nablus, Palestine
²⁶Department of Chemistry, College of Science and Technology, North Carolina Agricultural and Technical State University, Greensboro, North Carolina, USA
²⁷Faculty of Forestry, Agriculture and Forestry University, Hetauda, Nepal
²⁸Department of Forest Conservation and Protection, Faculty of Forestry, University of Khartoum, Khartoum, Sudan
²⁹Department of Biological Sciences, University of Embu, Embu, Kenya
³⁰Indian Institute of Science Education and Research Kolkata, Mohanpur, India
³¹CSIR-Soil Research Institute, Kumasi, Ghana
³²Laboratory of Soil Biology and Microbial Ecology, Department of Environmental Studies, University of Delhi, Delhi, India
³³Department of Botany, Gauhati University, Guwahati, India
³⁴Nova Biotech, Guwahati, India
³⁵Department of Biological Sciences, Bridgewater State University, Bridgewater, Massachusetts, USA
³⁶School of Forestry, University of Canterbury, Christchurch, New Zealand
³⁷Maharana Pratap University of Agriculture and Technology, Udaipur, India
³⁸Patanjali Organic Research Institute, Haridwar, India
³⁹National Centre of Excellence in Geology, University of Peshawar, Pakistan
⁴⁰CIAT, Kenya
⁴¹Universiti Malaysia Terengganu, Institute of Tropical Biodiversity and Sustainable Development, Terengganu, Malaysia
⁴²Research Team in Science and Technology, Higher School of Technology of Laayoune, Ibn Zohr University, Laayoune, Morocco
⁴³Sustainable Soil Management Group, Van Hall Larenstein University of Applied Sciences, Leeuwarden, The Netherlands

¹Centro de Investigación e Innovación para el Cambio Climático (CiiCC), Universidad Santo Tomás, Valdivia, Chile

²Amsterdam Institute for Life and Environment, Section Ecology and Evolution, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands

³Algoma University, Sault Ste Marie, Ontario, Canada

⁴Hawkesbury Institute for the Environment, Western Sydney University, Penrith, New South Wales, Australia

⁵Wageningen UR, Wageningen, The Netherlands

⁶Universidade Federal do Paraná, Curitiba, Brazil

⁷Embrapa Forestry, Colombo, Brazil

⁸Northern Alberta Institute of Technology, Edmonton, Alberta, Canada

⁹Independent Researcher. Cà Colonna srl, Ravenna, Italy

¹⁰Facultad de Ingeniería, Universidad de La Salle, Bogotá, Colombia

¹¹Universidade de Coimbra, Coimbra, Portugal

¹²Global Soil Biodiversity Initiative, Fort Collins, Colorado, USA

¹³State Key Laboratory of Regional and Urban Ecology, Ningbo Observation and Research Station, Institute of Urban Environment, Chinese Academy of Sciences, Xiamen, China

- ⁴⁴Dalian University, Dalian, China
- ⁴⁵Senckenberg Museum of Natural History Goerlitz, Görlitz, Germany
- ⁴⁶Severtsov Institute of Ecology and Evolution RAS, Moscow, Russia
- ⁴⁷Department of Earth, Environment and Life Sciences, Genoa University, Genoa, Italy
- ⁴⁸Department of Biology, College of Science, United Arab Emirates University, Al Ain, United Arab Emirates
- ⁴⁹MS Swaminathan Research Foundation, Chennai, India
- ⁵⁰Luxembourg Institute of Science and Technology, Luxembourg City, Luxembourg
- ⁵¹Raja Narendralal Khan Women's College (autonomous), Midnapore, West Bengal, India
- ⁵²Department of Ecology and Animal Biology, University of Vigo, Vigo, Spain
- ⁵³Department of Biology, University of Graz, Graz, Austria
- ⁵⁴School of Engineering, University of British Columbia - Okanagan, Kelowna, British Columbia, Canada
- ⁵⁵University of Derby, Derby, UK
- ⁵⁶Department of Geography and Resource Management, The Chinese University of Hong Kong, Hong Kong
- ⁵⁷Trier University, Trier, Germany
- ⁵⁸Department of Evolutionary Biology, Ecology and Environmental Sciences, Universitat de Barcelona, Barcelona, Spain
- ⁵⁹Panskura Banamali College (Autonomous), Purba Medinipur, India
- ⁶⁰University of the West of England, Bristol, UK
- ⁶¹The Centre for Development Research (ZEF), University of Bonn, Bonn, Germany
- ⁶²Department of Biology, J. J. Strossmayer University of Osijek, Osijek, Croatia
- ⁶³School of Biological, Earth and Environmental Sciences; and Sustainability Institute, University College Cork, Cork, Ireland
- ⁶⁴Cairo University, Giza, Egypt
- ⁶⁵School of Biosciences and Veterinary Medicine, University of Camerino, Camerino, Italy
- ⁶⁶Laboratory of Agricultural Production Improvement, Biotechnology and Environment, Faculty of Sciences, Mohammed First University, Oujda, Morocco
- ⁶⁷Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Moscow, Russia
- ⁶⁸Instituto de Ecorregiones Andinas (INECOA), CONICET - Universidad Nacional de Jujuy, San Salvador de Jujuy, Argentina
- ⁶⁹Department of Soil, Water and Agriculture Engineering, Sultan Qaboos University, Muscat, Oman
- ⁷⁰Universidade Federal de Santa Catarina, Florianópolis, Brazil
- ⁷¹Research Institute on Terrestrial Ecosystems, Italian National Research Council, Florence, Italy
- ⁷²Entomology Laboratory, Faculty of Biological Sciences, Universidad Nacional de San Agustín de Arequipa, Arequipa, Peru
- ⁷³Federal University of Espírito Santo, Alegre, Brazil
- ⁷⁴VU, Amsterdam, The Netherlands
- ⁷⁵Departamento de Biodiversidad, Ecología y Evolución, Facultad de Ciencias Biológicas, Universidad Complutense de Madrid, Madrid, Spain
- ⁷⁶INRAE, Université de Rouen Normandie, Rouen, France
- ⁷⁷Littoral Environnement et Sociétés (LIENSs), UMR 7266, CNRS, La Rochelle Université, La Rochelle, France
- ⁷⁸Forest Research Center, Associate Lab. TERRA, School of Agriculture, University of Lisbon, Lisbon, Portugal
- ⁷⁹University of Guelph, Guelph, Ontario, Canada
- ⁸⁰Universidade Estadual Paulista (UNESP), Jaboticabal, Brazil
- ⁸¹Centre for Environment Assessment and Climate Change, GB Pant National Institute of Himalayan Environment, Kosi-Katarmal, Almora, India
- ⁸²Mississippi State University, Starkville, Mississippi, USA
- ⁸³AgriGro, Inc, Doniphan, Missouri, USA
- ⁸⁴College of Agriculture, Iroisemba, Central Agricultural University, Imphal, India
- ⁸⁵Centro de Bioquímica y Microbiología del Suelo, Universidad Nacional de Quilmes, Bernal, Argentina
- ⁸⁶Dept. Ecología y Biología Animal, Facultad de Biología, Universidad de Vigo, Vigo, Spain
- ⁸⁷School of Agriculture, Food and Ecosystem Science, The University of Melbourne, Melbourne, Victoria, Australia
- ⁸⁸Department of Biosystems Engineering, Auburn University, Auburn, Alaska, USA
- ⁸⁹School of Agriculture, Food and Ecosystem Sciences, Faculty of Science, University of Melbourne, Parkville, Victoria, Australia
- ⁹⁰Punjab Agricultural University, Ludhiana, India
- ⁹¹Grupo de Ecología Animal (GEA), Universidad de Vigo, Vigo, Spain
- ⁹²Center of Excellence in Environmental Studies, King Abdulaziz University, Jeddah, Saudi Arabia
- ⁹³Department of Agricultural Development, Democritus University of Thrace, Orestiada, Greece
- ⁹⁴Northwestern University, Evanston, Illinois, USA
- ⁹⁵Department of Earth and Planetary Sciences, Johns Hopkins University, Baltimore, Maryland, USA
- ⁹⁶Faculty of Agricultural, Environmental and Food Sciences, Free University of Bozen-Bolzano, Bolzano, Italy
- ⁹⁷Soil Biology Group, Wageningen University and Research, Wageningen, The Netherlands
- ⁹⁸University of Southern Queensland, Ipswich, Queensland, Australia
- ⁹⁹Directorate of Irrigation and Agricultural Mechanization Services, County Government of Mandera, Mandera, Kenya
- ¹⁰⁰SAARC Agriculture Center, Dhaka, Bangladesh
- ¹⁰¹Department of Sustainability, ENEA, Rome, Italy
- ¹⁰²Institute of Zoology, Ilia State University, Tbilisi, Georgia
- ¹⁰³Natural History Museum London, London, UK
- ¹⁰⁴Department of Agriculture Technology, Government Degree College, Sopore, India
- ¹⁰⁵School of Biological Sciences, University of Southampton, Southampton, UK
- ¹⁰⁶Institute of Agriculture, Warsaw University of Life Sciences, Warsaw, Poland
- ¹⁰⁷School of Agriculture and Food Science, University College Dublin, Dublin 4, Ireland
- ¹⁰⁸Faculty of Sciences - Agadir, University of Ibnou Zohr (UIZ), Agadir, Morocco

- ¹⁰⁹Department of Microbiology, Stellenbosch University, Stellenbosch, South Africa
- ¹¹⁰Dangote Agricultural Services, Dangote Fertiliser Limited, Lekki, Nigeria
- ¹¹¹Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences, Shivamogga, India
- ¹¹²Instituto de Suelos, Havana, Cuba
- ¹¹³Tecnologico Nacional de Mexico, Mexico City, Mexico
- ¹¹⁴Chair for Environmental Microbiology, Technical University of Munich, Munich, Germany
- ¹¹⁵CIFOR-ICRAF, Kenya
- ¹¹⁶CNR-IPSP, National Research Council – Institute for Sustainable Plant Protection, Turin Unit, Torino, Italy
- ¹¹⁷Área de Ecología, Departamento de Botánica, Ecología y Fisiología Vegetal, Universidad de Córdoba, Córdoba, Spain
- ¹¹⁸University of Manitoba, Winnipeg, Manitoba, Canada
- ¹¹⁹School of Biology, Department of Ecology, Aristotle University of Thessaloniki, Greece
- ¹²⁰Maybank Malaysia, Kuala Lumpur, Malaysia
- ¹²¹Zenkinoko SAS, Bogota, Colombia
- ¹²²ISPR, Rome, Italy
- ¹²³Forest Department, Ministry of Natural Resources and Environmental Conservation, Myanmar
- ¹²⁴University of Vermont, Burlington, Vermont, USA
- ¹²⁵Soil Biology Laboratory, Soil Science Department, Faculty of Agriculture, Universitas Padjadjaran, Bandung, Indonesia
- ¹²⁶Ministry of Forestry, Suva, Fiji
- ¹²⁷Farzanegan Campus, Semnan University, Semnan, Iran
- ¹²⁸Department of Biology, Faculty of Science, Bu-Ali Sina University, Hamedan, Iran
- ¹²⁹Land and Forest, Gunnarsholt, Iceland
- ¹³⁰Service National des Sols (SENASOL), Conakry, Guinea
- ¹³¹School of Mathematical and Natural Sciences, Arizona State University, Phoenix, Arizona, USA
- ¹³²College of Agriculture, University of Saskatchewan, Saskatoon, Saskatchewan, Canada
- ¹³³University of Western Ontario, London, Ontario, Canada

Correspondence

César Marín, Centro de Investigación e Innovación para el Cambio Climático (CiiCC), Universidad Santo Tomás, Av. Ramón Picarte 1130, Valdivia 5090000, Chile.
Email: cmarind@santotomas.cl

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ORCID

César Marín  <https://orcid.org/0000-0002-2529-8929>
 Carlos Barreto  <https://orcid.org/0000-0003-2859-021X>
 Brajesh K. Singh  <https://orcid.org/0000-0003-4413-4185>
 Jeff Battigelli  <https://orcid.org/0000-0002-7334-7342>

- Gian Luca Bagnara  <https://orcid.org/0000-0002-6115-2038>
 Rosalina González  <https://orcid.org/0000-0002-5860-657X>
 Carlos Guerra  <https://orcid.org/0000-0003-4917-2105>
 Xin Sun  <https://orcid.org/0000-0002-3988-7847>
 Tara Dirilgen  <https://orcid.org/0000-0001-9687-9651>
 Jacob Ulzen  <https://orcid.org/0000-0001-7378-1002>
 Giulio Malorgio  <https://orcid.org/0000-0001-6899-8880>
 Luca Montanarella  <https://orcid.org/0000-0002-4176-3878>
 J. Jacob Parnell  <https://orcid.org/0000-0002-2295-9779>
 David Kothamasi  <https://orcid.org/0000-0002-6344-9249>
 Leandro Fonseca de Souza  <https://orcid.org/0000-0002-0774-7428>
 Zoë Lindo  <https://orcid.org/0000-0001-9942-7204>

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SUPPORTING INFORMATION

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