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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

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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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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

There are no data associated with the paper.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.