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### The 4 per 1000 Initiative

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Soil organic matter is at the nexus of global challenges: food security, climate change adaptation and mitigation, soil security. The 4 per 1000 initiative, launched at the Climate COP21 within the Lima-Paris Action Agenda proposes to increase soil organic carbon (SOC) stocks to simultaneously address all these challenges. It directly addresses three sustainable development goals: SDG2 'no hunger', SDG13 'Climate action', and SDG15 'Life on land' and indirectly concerns several others. The initiative targets agricultural soils in priority, which are often the most degraded soils and because of the high expected benefits in terms of soil fertility and hence of productivity. A range of agricultural practices are available that allow to increase SOC stocks while ensuring a resilient, productive and environmentally friendly agriculture, so that a large-scale deployment can be aimed at. Here, we review and discuss the main limits and criticisms addressed to the 4 per 1000 initiative. These are biophysical barriers (permanence and reversibility of the soil organic C storage (needs for water, nutrients), trade-offs (other GHG emissions, other uses of the biomass), and socio-economic barriers (adoption of practices, economic benefits, adequate incentives). The feasibility of the proposed aspirational target (an annual increase of standing SOC stocks by 0.4%) is also debated. This lively debate helps to shape the initiative and shows that the implementation of the initiative has to be spatially differentiated, accounting for socio-economic and pedoclimatic regional differences. Avoiding GHG emissions from organic rich soils, such as peatlands, remains a priority. The 4



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per 1000 initiative has successfully placed soils in the political arena and is a unique opportunity, in combination with other global efforts such as the Global Soil Partnership, to set a platform between scientists, policy makers and practitioners for interactions and common action. The plan of action of the 4 per 1000 initiative includes advocating the importance of soils and soil organic matter and engaging a diversity of local, national and international stakeholders, establishing priorities for an international research and scientific cooperation program, providing reference criteria and indicators for SOC management projects evaluation, setting up a collaborative platform open to partners and members of the initiative and developing a digital resource centre on soil organic carbon management.

**Keywords:** Soil organic matter; carbon sequestration; science – policy interface.

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