

Positive cascading effect of restoring forests

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Recent assessment of global tree restoration potential reports that under current climate conditions there would be room for additional 0.9 billion hectares of woodlands and forests Bastin (2019). This could store 205 gigatonnes of carbon making forest restoration a viable strategy for climate change mitigation. Commenting on Bastin (2019), Chazdon and Brancalion (2019) call for holistic approaches because forest restoration is a mechanism to achieve multiple goals that go beyond climate mitigation, also including biodiversity conservation, socioeconomic benefits, food security, and ecosystem services. A timely scientific debate considering the recent decision of the UN Environment Assembly in Nairobi, Kenya, to declare the coming decade 2021–2030 the UN Decade on Ecosystem Restoration (Link 1).

This interesting scientific debate could be further enhanced by including aspects of symbiotic partnerships between trees, soil and of microbes such as fungi and bacteria (Steidinger, Crowther, Liang, & Ch Zo-Bi, 2019). Forests play a major role in soil development and are thus the most effective form of soil protection from erosion processes which today is the greatest global threat to soil function (Montanarella et al., 2015). A global increase in vegetation coverage could offer better conditions to soils to develop, mutually support biota, moderate quality and quantity of water resources and store carbon (Lal, 2018). Soils are the largest terrestrial organic carbon (C) pool (2376–2450 Pg C to a depth of 2 m), containing about three times more C than in the atmosphere (Chappell, Baldock, & Sanderman, 2016). It is estimated that every year about $2.5_{-0.3}^{0.5}$ Pg C/year are displaced due to water erosion (Borrelli et al., 2018). Thereof, a large share of displaced carbon comes from poorly vegetated lands. An increase of 0.9 billion hectares of forests would have the potential of decreasing annual displaced carbon of an approx. 20–30%, with positive effects on land-atmospheric carbon feedback (Lugato et al., 2018).

With the upcoming UN Decade on Ecosystem Restoration (2021–2030) and UN Food and Agriculture Organization calling for actions to stop soil erosion (Link 2), it is time to strengthen ties between disciplines, to join forces and act holistically.

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Links

- Link 1: UN decade on ecosystem restoration. <https://www.unenvironment.org/news-and-stories/story/new-un-decade-ecosystem-restoration-inspire-bold-un-environment-assembly>.
- Link 2: FAO global symposium on soil erosion. <http://www.fao.org/about/meetings/soil-erosion-symposium/about-the-symposium/en/>.

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