EDITORIAL

Give soils their due

We are not paying enough attention to the world's soils, a "nearly forgotten resource" and our "silent ally," 33% of which are in a state of degradation.* We can't breathe, eat, drink, or be healthy without sustainably managing soils. So in recognizing 2015 as the International Year of Soils, the United Nations (UN) is focusing global attention on the increasing pressures on soils and their ripple effect on other global challenges.

A major concern is whether soils will support the growing demand for food. Human activities have transformed soils, lands, and regions, with long-lasting effects that include desertification, decreased organic matter in soils, altered biodiversity, and changed biogeochemical and hydrological cycles. As a result, the land available for food production is shrinking, irreversibly in some cases. Converting cropland to biofuel systems and urban centers is having the same effect. Agricultural practices have increased soil erosion to rates much greater than those of soil formation (it can take up to 1000 years to form 1 cm of soil). The mismanagement of soil resources is exacerbating these assaults on the food supply.

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The good news is that there is a mandate to improve soil management. With soil security now a priority, several Draft UN Sustainable Development Goals (2016 to 2030) directly and indirectly involve soils. Goals 2 and 15, for example, target sustainable food production and the use of lands. Nations also are addressing the major consequences of the misuse and mismanagement of soils through focused agendas: degraded land (UN Convention to Combat Desertification), loss of biodiversity and ecosystem services (UN Convention on Biological Diversity), and increased greenhouse gas emissions (UN Framework Convention on Climate Change). Further, the Global Soil Partnership—a voluntary partnership between national governments, concerned stakeholders (including universities, industry, and landowners), and nongovernment organizations—is facilitating collaborations among these conventions. Its achievements are promising: An Intergovernmental Technical Panel on Soils is now advising on global soil issues.

Exploration of soil's unique habitats reveals numerous microbes and invertebrates that contribute to life-sustaining services such as cleansing water, regulating pests, and cycling nutrients. Connections between different soil biota can be severed through mismanagement of all lands: cities, forests, deserts, grasslands, and agricultural fields. Hence, this connectedness extends to bonds between soil biota and humans, and we must improve the functioning of soil biota as part of our long-term commitment to a sustainable future.

A holistic management approach to soils requires understanding that human health depends on nondegraded soils not only for food but for clean air and water. Air pollutants derived from disturbed soils include volatile organic compounds, greenhouse gases, dust, and biota. These are transported by wind for hundreds to thousands of miles. The impact of such mobility by potential pathogens such as parasitic worms on plants, animals, and humans is becoming clearer. Because soils are also one of the largest stores of carbon that is in direct exchange with the atmosphere, soil degradation negatively affects society via climate change feedbacks. The water we drink depends on maintaining soils that store, filter, and cleanse water. Although the soil–clean air–clean water–human health linkage has led to air and water regulations, they do not address the cause of the impacts: the mismanagement of soil.

The 2015 International Year of Soils is an occasion to celebrate and raise awareness of Earth's soil and its functions for humanity. As we pave fertile soils for cities, expand agriculture into marginal lands such as polar regions and deserts, and address climate change impacts of droughts and floods, we should consider the benefits that managing soils provides for multiple global environmental issues. As U.S. President Franklin D. Roosevelt said, "A nation that destroys its soils destroys itself."

– Diana H. Wall and Johan Six

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*www.fao.org/news/story/en/item/270812/icode/.

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