

Australia's soils have sent us a warning: We should listen

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Praveena Sridhar, the CTO of the Save Soil Movement, believes that Australia's soil has been signalling a message to us, and as a result, we ought to pay attention

'Keeping carbon in the ground' has become the rallying cry of environmentalists across the globe. Yet this doesn't just apply to fossil fuels but to our soils, too.

Have Australia's soils sent us a warning? Should we listen?

Currently, our soil contains more stored carbon than the atmosphere and plant matter combined. This makes our soils the world's second-largest carbon sink, behind our oceans.

However, soil's status as a carbon sink is under threat. Recent research has revealed that a warming climate could make Australian soils a net emitter of carbon dioxide over the next two decades.

The study estimated that the median annual emissions from Australia's soils will range from about 30 to 100 megatonnes of CO₂ over the next 100 years. This would mean that the soil carbon emissions during the years 2020 to 2045 would be equivalent to 14% of the country's total 2022 emissions.

This degradation can trigger a negative climate feedback loop. By emitting more carbon than they store, Australia's soils could cause additional global heating, which could further exacerbate soil's carbon losses.

This should be seen as a global warning. Australia has repeatedly been the 'canary down the coal mine' of climate change. Between the wildfires, droughts, heat waves, and now soil degradation, where Australia goes, the rest of the world should expect to follow. Indeed, these extreme climatic events can put farmers' livelihoods at risk, as they can cause livestock death, lead to insect plagues, financial hardship, and damage to mental health.

History can explain in part why Australia's soils are so vulnerable. The introduction of a distinctly European style of agriculture in 1788 led large areas of native flora and fauna to be cleared. The extensive land-clearing, invasive livestock and foreign crops all added to Australia's accelerated soil degradation.

Today, some 55% of Australia's land is used for agriculture. While there is a growing movement to adopt more regenerative practices across Australia, only a handful of Australian farmers still use regenerative farming practices. Regenerative farming, in short, is a farming approach that restores soil health, enhances biodiversity and improves ecosystem resilience by using practices like crop rotation, cover cropping and reduced tillage.

Soil management in Australia

Of course, boosting the fertility and, therefore, the carbon storage potential of soil is a question of management. Using both crop rotation and cover cropping can help to maintain a healthy soil structure, which in turn helps to prevent erosion and enhance soil fertility. Reducing tillage, engaging in agroforestry and promoting further carbon farming methods could boost soil fertility and carbon retention.

One illustrative example is the case of two Queensland farmers who were the first to receive a large-scale sum of carbon credits, totalling 151,312 Australia Carbon Credit Units, meaning they were able to show their farming practices sequestered an extra 151,312 tonnes of CO₂ in the soil.

The Lawrie family shifted from set-stocking to resting paddocks and intensive time-controlled grazing, a form of rotational grazing where small paddocks are heavily stocked for short periods, followed by a long resting period. The Archer family also introduced time-controlled grazing, legumes, and subtropical grasses. Both families' management of the soil carbon project also resulted in an increase in favourable species, productivity and carrying capacity. With increased groundcover and deep-rooted perennial species, there was an improvement in water infiltration, and consequently, the farm recovered much faster from dry periods.

Pivoting to a more regenerative style of farming is a matter of education. For example, many farmers may need to learn that regenerative practices can boost not only the environmental sustainability of a farm but its economic sustainability, too. A study commissioned by the Australian Federal Department of Environment showed that the average profits of regenerative graziers were consistently higher than comparable farms (particularly in years where there was low rainfall).

The rest of the world could learn from this approach. Globally, our soils remain a net carbon sink, and a crucial buffer against climate change. Yet we cannot take this state for granted; 24 billion tonnes of fertile soil is lost per year. According to Rattan Lal, Director of Ohio State University's Carbon Management and Sequestration Centre, the world's cultivated soils have lost between 50 and 70% of the original carbon stock, much of which becomes oxidised upon exposure to air to become CO₂.

Some of this soil degradation is outside of our immediate control; higher temperatures, along with longer droughts, are causing our soils to shed their carbon load. However, the use of intensive farming practices, along with the use of pesticides, is another key driver of soil degradation. Today, some 40% of the world's land has already been taken over by agriculture, a large percentage of which uses intensive practices.

Put soil preservation at the top of the agenda

Building back life and health into the world's soil is as much a humanitarian necessity as it is an environmental one. The world's population is set to reach just under 10 billion by 2050. At that same time, some estimates predict that up to 95% of the world's land could be degraded in the same time period. This reduction in arable land could lead to disease, food shortages, water shortages and mass migration.

Intensive farming practices are inherited from the industrial era's mechanical mindset. Instead of regarding our farmland as simply an economic resource from which we can extract value, it should be seen as a living, breathing organism that will only nurture and nourish us if we return the favour.

We have time to correct our course. This year, through the UNCCD 16th session on the Conference of Parties, the Biodiversity Conference of 2024, and COP 29 in Azerbaijan, we have a triple opportunity to put the preservation of our soils at the top of the agenda. Ensuring that we maintain a minimum of 3 to 6% of organic matter in our soils should be seen as a global security priority.

Australia's soils have sounded the alarm. Will we listen?