Earth's soils could play key role in locking away greenhouse gases

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Credit: Mick Lissone/public domain

The world's soils could store an extra 8 billion tonnes of greenhouse

gases, helping to limit the impacts of climate change, research suggests.

Adopting the latest technologies and sustainable land use practices on a global scale could allow more emissions to be stored in farmland and natural wild spaces, the study shows.

Growing crops with deeper root systems, using charcoal-based composts and applying sustainable agriculture practices could help soils retain the equivalent of around four-fifths of annual emissions released by the burning of fossils fuels, the team says.

The role that soils could play in efforts to combat climate change has until now been largely overlooked, owing to a lack of effective monitoring tools, say a team of scientists including researchers at the Universities of Aberdeen and Edinburgh. Recent advances in technology have enabled researchers to work out their full potential.

Coordinated efforts involving scientists, policymakers and land users are key to achieving any meaningful increase in soil storage of greenhouse gases, researchers say. Resources should be provided to help reduce the environmental impact of farms, they add.

Community-based initiatives would help to overcome cultural barriers, funding issues and monitoring challenges to achieve a global increase in soil uptake, the team says. Schemes such as the Cool Farm Tool, a free online greenhouse gas calculator for crop growers, help farmers measure, manage and reduce emissions from their land.

Previous research shows that soils currently lock away around 2.4 trillion tonnes of greenhouse gases, which are stored underground as stable organic matter.

The study, published in the journal *Nature*, received funding from the

Natural Environment Research Council. The research was carried out in collaboration with Colorado State University, Cornell University and Michigan State University.

Professor Dave Reay, of the University of Edinburgh's School of GeoSciences, said: "In the fight to avoid dangerous climate change in the 21st century we need heavyweight allies. One of the most powerful is right beneath our feet. Soils are already huge stores of carbon, and improved management can make them even bigger.

"Too long have they been overlooked as a means to tackle climate change. Too often have problems of accurate measurement and reporting stymied progress towards climate-smart soil management. With the surge in availability of 'big data' on soils around the world, alongside rapid improvements in understanding and modelling, the time has come for this big-hitter to enter the ring."

Professor Pete Smith, of the University of Aberdeen, said: "Soils have probably been overlooked as you cannot see the large carbon stocks they contain, whereas you can see trees growing and getting bigger. It is also difficult to easily measure changes in soil carbon as changes are slow and we are trying to measure a small change against a large background.

"But after International Year of Soils in 2015, and the French Government's initiative to increase soil carbon stocks to tackle climate change agreed at the Paris climate summit last December, soils are now firmly on the climate change agenda."

More information: Climate-smart soils, *Nature*, DOI: 10.1038/nature17174

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