



Unlocking private investment in soil carbon in England

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New recommendations for the design of high-integrity agricultural soil carbon markets highlight difficulties for farmers to enrol in both Sustainable Farming Incentive (SFI) and emerging agricultural soil carbon markets. To unlock private finance, new public schemes should focus on paying farmers for soil carbon testing, and keeping carbon stored in already well-managed, carbon-rich soils.

Overview

- **The Sustainable Farming Incentive (SFI) pays farmers to sow cover crops and add soil organic matter, potentially preventing farmers from entering Voluntary Carbon Markets (VCM) for these practices.**
- **This is a problem since the SFI funded practices are those most likely to store carbon, leaving poorly evidenced practices for the market, and public funding is paying for outcomes that markets could pay for.**
- **New payments for soil carbon testing, that already available in Scotland, Northern Ireland and Australia, would reduce costs for farmers entering VCM, making private investment more viable to farmers.**
- **A new Countryside Stewardship option should be considered for keeping Soil Organic Carbon (SOC) levels above comparable farms, rewarding early adopters of carbon farming practices and increasing the permanence of carbon in soils after VCM contracts have elapsed.**
- **Alternatively, SFI could continue paying for soil carbon as long as the full costs are not met, allowing projects to receive co-finance.**



Policy context

Agricultural subsidies in England are transitioning from paying farmers to maintain food production to the delivery of public goods including climate mitigation, biodiversity and flood protection. However, according to the Green Finance Institute (2021) an estimated £21-£53bn of additional private green finance would be needed to meet the 25 Year Environment Plan in England alone. Better alignment of the developing Environmental Land Management (ELM) schemes and private carbon markets are key to unlocking such investment.

Recognising the need for private finance to meet net zero and biodiversity goals in the land use sector, Defra are developing an Ecosystem Markets Framework alongside its forthcoming Green Investment Strategy, which will introduce core principles for the operation of high-integrity carbon and other ecosystem markets, including a mechanism to evaluate the quality of existing 'codes' and standards. In addition, the UK Environmental Reporting Guidelines are being revised to increase integrity of scope 3 carbon offsetting by companies and partnerships.

Existing policy fails to protect and restore soils

Greenhouse gas (GHG) emissions from the UK agricultural sector (44.8 MtCO₂eq in 2020, **Agri-Climate Report 2022**) has seen negligible declines in the last decade, which has been cited as a major barrier to the UK meeting its Net Zero by 2050 Climate Change Act and the commitments under the Paris Agreement. Practices aimed at increasing Soil Organic Carbon (SOC) can add an estimated 10 MtCO₂eq by 2050 (**Land Use report, CCC 2022**) to the current stock of 9.8bn tonnes of carbon in Britain's soils, but badly managed carbon-rich soil can be a major source of GHG emissions. The potential of carbon sequestration should not be considered in isolation but with all the productivity and ecosystem benefits that increased SOC delivers – biodiversity, clean water, flood risk management etc.

Currently, policies relating to soil management include the Farming Rules for Water and Basic Payment Scheme cross-compliance rules (Good Agricultural and Environmental Conditions (GAEC) 4, 5, 6). These include providing minimum soil cover, minimising soil erosion and maintaining the level of soil organic matter (SOM) in soil. The GAEC include no obligation to measure baseline data for existing soil carbon stocks, and no mechanisms to establish either compliance or breach for most GAECs. These rules are expected to cease to apply as part of the transition away from the EU Common Agricultural Policy in 2024.

The SFI pilot creates barriers to VCM for agricultural soils

The development of new public and private schemes has to ensure the two schemes co-exist harmoniously. Central to these is the concept of 'additionality'; the principle that buyers/investors will only pay for carbon-sequestering activities that would not happen without carbon funding. Additionality sits alongside other core principles of all carbon codes which include robust measurement, reporting, and verification (MRV) protocols, permanence (maintaining SOC after project end) and avoiding social or environmental harm ('do no harm' principles). A report recommending Minimum Requirements for agricultural soil carbon codes was recently published by the UK Farm Soil Carbon Code (UKFSCC) consortium (see References).

One additionality criterion is that projects must prove they would not have been financially viable without carbon funding – often referred to as 'financial feasibility' or 'investment' tests. As part of this, codes may set a minimum threshold for the contribution of carbon finance for the project to be considered additional (this financial feasibility test is set at 15% in the Peatland Code), or they may require evidence that the project would not have been financially viable without carbon finance, for example under the Woodland Carbon Code's investment test. In a recent review of 12 international soil carbon codes (Black et al 2022), it was found that investment tests are required in the majority of international codes.

Under the terms of the SFI arable and horticultural soils standards, farmers will be paid for three separate suites of actions across two tiers – introductory and intermediate. A fourth, relating to no/minimum tillage, is being considered for inclusion in the 'Advanced' tier. The SFI guidance specifically includes cover crops and the addition of SOM with the clear rationale to '...bring benefits for soil biodiversity and carbon storage'.

As it stands, Defra indicate that they will measure the impact of the SFI in terms of 'outputs' (e.g., area of ground covered) rather than 'outcomes' (e.g., carbon sequestered). However, regardless of explicit or implicit language on soil carbon sequestration in the SFI scheme guidance, SFI payment rates are determined (in principle) on a cost incurred/income foregone basis, and hence by design fully cover the cost of such actions without the need for carbon financing. This would preclude VCM payments for the same practices, as they will fail financial feasibility/investment tests.

Option 1 – allow a reduced SFI payment rate

Allow farmers to get a SFI payment rate covering only 85% of costs for options designed to mitigate climate change, allowing projects to pass ‘financial feasibility’ tests. SFI costings need to be made public and transparent to allow verification that they do not cover the full costs of implementation.

Pros: allows farmers to apply SFI and enter private schemes for the same practices.

Cons: may need to have different rates to reflect the variability in costs and opportunity costs across England and between different farm types.

The importance of soil testing

The new SFI standard requires farmers to test their SOM. Defra’s February 2020 Farm Practices Survey revealed that practices relating to GHG mitigation are widespread, with 66% of farmers currently taking action to reduce GHG emissions from their farm. However, only 32% of farmers keep track of SOM. This demonstrates farmers willingness to address GHG emissions, but low awareness of soil carbon’s potential to contribute - 43% of farmers that don’t measure SOM gave the reason it is ‘not important enough to test for’.

The required soil testing as part of SFI soils standards is insufficient to measure, report or verify SOC stocks or sequestration. Firstly, it combines soil samples from across the field, which ignores known spatial differences even within typical fields. It only asks to sample the top 15 cm of soil and does not require assessment of change to bulk density which is required to calculate SOC stocks. Finally, SFI allows the use of loss-on-ignition method, which is not accurate enough to determine SOC change over time, especially on heavy soils.

A professional soil carbon sampling and analysis, including bulk density assessment, typically costs around £65-£85 per sample in the UK. However, these costs can be dramatically reduced using automation and remote sensing. For example, new technologies are available that can design, sample, process and analyse SOC stocks at a starting cost of £5 per sample or £30/ha. Other innovators are trialling satellite remote sensing to monitor SOC.

The rapidly dropping cost of soil testing motivated several public administrations to provide dedicated funding to farmers to test their soils. In Scotland, farmers can get up to £30/ha to perform soil sampling on 20% of their land

annually. In Northern Ireland, the devolved administration pays companies to test farmers’ soils. A similar scheme exists in Australia, who also pays for historically collected soil data. Most recently, the European Commission published their EU Soil Strategy 2030 which calls Members States to “... put in place through national funds the ‘test your soils for free’”.

Reducing the cost of soil testing, a key part of VCM codes for baselining and verification of sequestered SOC, will make carbon finance much more attractive. As an illustrative example, with carbon prices of about £30 per tonne of carbon sequestered in soil (based on figures from two soil carbon schemes operating in the UK), achieving 0.2 tC/ha/yr will generate £60/ha income to farmers over a 10-year project lifetime. This just about breaks even with soil testing costs (before and after project), based on Scottish scheme payment rates.

Option 2 - payments for monitoring SOC stocks

A soil testing scheme would reduce the cost for private schemes and help unlock private investment. This could be paid to farmers (as done in Scotland) or via a tender to organizations to do the sampling and testing (as in NI). If linked to benchmarking, this could fall under advisory services exemption in the “Green Box” of the World Trade Organization.

Pros: will reduce costs of entering VCM and provide a regional baseline of ‘comparable’ farms.

Cons: concerns of keeping soil testing market competitive (especially with NI model), data protection and ownership of soil testing data.

SOC as a Public Good

SOC is the essential ‘engine’ for soil health, microbiology, nutrient cycling and many other processes that maintain healthy soils and is key to the climate resilience of our food system. That recognition is reflected in the National Food Strategy independent review which recommended that ‘roughly a third of the ELMs budget – £500–£700 million per year – should go on paying farmers to manage the land in ways that actively sequester carbon and restore nature’. It is therefore justified to pay public money to keep SOC where it is ‘above and beyond’ comparable farms. Indeed, the recent European Commission proposal for carbon removals certification argues for adopting a baseline reflecting the “*standard performance of comparable activities in similar social, economic, environmental and technological circumstances and geographical locations*”.



Option 3 – public payments for maintaining SOC in soils

Set a new Countryside Stewardship option for maintaining SOC above ‘comparable’ farms to keep SOC sequestered by early entrants and secure SOC in the long term. Paying the difference between ‘comparable’ farms and the farmer’s baseline will ensure additionality with VCM that pay to increase SOC above that baseline. A new national soil testing would define the baseline for ‘comparable’ farms.

Pros: addresses the issue of permanence where farmers do not want to maintain SOC after their VCM contract by more than 10 years (Phelan et al. 2022) whereas private buyers are asking for 25+ years.

Cons: may fall into “Amber Box” of the World Trade Organization.

Recommendations

There is no one solution to enable the operation of soil carbon markets in England. The authors’ recommendation is to consider all three options –reducing SFI rates (option 1) to allow co-funding, paying farmers to monitor SOC (option 2) to reduce costs of VCM schemes, and setting up a new soil carbon maintenance scheme (option 3, likely as a Countryside Stewardship option) to maintain SOC higher than ‘comparable’ farmers.

Further information

For a more detailed Sustainable Soil Alliance briefing paper see [Soil Carbon in the Sustainable Farming Incentive Observations and Recommendations](#)

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References:

1. GFI et al. 2021, [The Finance Gap for UK Nature](#)
2. UKFSCC 2022, [Recommendations on minimum requirements for high-integrity soil carbon markets in the UK](#)
3. Black H.I.J. et al. 2022, [What makes an operational farm soil carbon code? Insights from a global comparison of existing soil carbon codes using a structured analytical framework](#)
4. Phelan L. et al. 2022, [Reconciling farmers’ expectations with the demands of the emerging UK agricultural soil carbon market](#)

Disclosure statement

The authors have no potential competing interest.