



A METRIC FOR SOIL?

A summary report of a multi-stakeholder discussion on finding a metric for soil health

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The importance of soil health

During war-time and post-war Britain, productivity of the soil was used as an indicator of good soil health. This approach was strongly encouraged by government to ensure that there was enough food to feed the population. Since this time UK farmers have been driven to increase farm productivity through increased yields, with a greater reliance on fertilisers and nutrients. The introduction of phosphates enhanced this process, allowing farmers to increase productivity by increasing the number of growing season, but this has come at a cost to natural nutrients.

These practices have largely continued until the present day; there is now a growing concern for the state of the UK's soils, water and habitats. In England and Wales 2.2million tonnes of soil are lost every year, costing between £0.9 - £1.4 billion¹ and further damage is caused by soil compaction. Poor soil resilience is compounded by climate change and increased intensity rainfall events. This in turn impacts on water quality. The cost of removing nitrate and pesticides from surface and groundwater is £133million per year.

In the UK government's recent 25-year plan for the environment there is a recognition that practices need to change to sustain a productive agricultural sector and thriving environment. The government has committed to improving soil management approaches with a commitment that all of England's soils will be managed sustainably by 2030. To deliver this the government will use natural capital thinking to develop appropriate soil metrics and management approaches.

Improved soil management practices and soil metrics will be vital to addressing the soil challenges in England. In October 2017 Business in the Community, in partnership with the Grantham Centre for Sustainable Futures convened businesses around the question of 'Could we find a metric for soil health?'. This report is a summary of this discussions between the organisations present and provides BITC's recommendations on next steps for the short and long-term solutions.

¹ Safeguarding our soils: A strategy for England (2009) Defra https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69261/pb13297-soil-strategy-090910.pdf

The challenges of a metric for soil

Metrics around carbon and water are increasingly included in annual sustainability reporting by companies. This has helped businesses set targets to reduce their carbon and water footprints, driving sustainability and reducing risk. However, unlike carbon and water, soil is not a homogenous resource. Soil varies in type, chemical composition and quality according to its context and its history. We do not 'extract' set values of soil as different types of agricultural will vary in their requirements and impact. A metric for soil would enable business, government and farmers to make more **informed land management decisions** that would optimise the natural capital value of soil.

Soil is degrading, putting the UK agricultural sector at risk, with the current rate of soil erosion is 10-100 times higher than it has been in the past². This can be measured through proxy indicators such as increased turbidity of surface water and increased demand for added nutrients, but we are not able to measure the rate of degradation to soil health. There isn't a single measure that will capture the key components of soil. **A metric is highly dependent on context**; for example, measurement of high levels of organic matter in peat soil does not record loss due to shrinkage/oxidation. There is a variation in soil health, nationally, locally between fields and even within fields.

In the UK farmers are currently required to check the chemical content of soil³ every five years. However, there is currently no requirement to measure biological content including; organic matter, structure, pH and oxygen content, this is the information that would indicate soil health. The lack of data on our national soils means that there is **no baseline**. Some countries are trying to address this knowledge gap, for example Sweden is currently developing a national database for soil, monitoring 2000 sites by taking measurements every 10 years⁴.

Importantly, any metric on soil would need to translate this complex picture into a single measurable, standardised unit. It should help government to understand the natural capital value of soil as a resource and avert risk in national planning. Businesses should be able to **benchmark** the impact of their supply chains on soil and the actions they have taken to mitigate these risks. Farmers should be able to use this information to manage their land to its optimal state whilst maintaining productivity. We should all be confident in a metric for soil that confirms that we have returned the land in a better state than we received it. A metric for soil health would be a **long-term commitment**. Changes in organic carbon are not seen in a year, but over a decade, so this is a

² House of Commons Environmental Audit Committee report on Soil Health (May 2016)

³ Defra, New Farming rules for water

⁴ Hartemink & McSweeney (2014) Soil Carbon

large investment of time and resource. With the current state of soils, we may not be able to wait until we have all the information before we can take action; many farmers are already changing practices to those that will replenish the soil, such as cover cropping. An ambition to have a metric for soil should not overshadow the opportunity for business and government to work with farmers to embed good practice.

The business case for soil

Natural capital is another term for the stock of renewable and non-renewable resources (e.g. plants, animals, air, water, soils, minerals) that combine to yield a flow of benefits to people⁵. Natural capital is a vital input and mechanism for reducing risk across a range of sectors and the need to manage this resource sustainably is increasingly recognised by business⁶. **Soil provides critical natural capital** for food & beverage companies who are reliant on good soil health for production. Good soil also helps reduce the risk of floods and droughts by enabling rain water to be stored below ground, critical for wider businesses including utilities, insurance and any business in downstream towns and cities.

Businesses increasingly recognise that soil poses a risk to their supply chains and capital assets and are frustrated by a lack of understanding about the scale and urgency of these issues. Addressing the inherent risks of soil degradation on the UK food and beverage sector requires long term planning and strategy. **Interventions need to take place at scale** to optimise the benefits for the UK's natural capital. A metric for soil health could be a useful tool in achieving this but ultimately businesses want to see outputs leading to impact.

Multi stakeholder engagement is critical to addressing these issues. There are clear drivers for businesses, government, academia and farmers to work together on a shared approach. Business action on soil requires a collaborative approach operating in a pre-competitive environment. Building the business case will be key to engaging the private sector, Nestlé are using the landscape enterprise network approach (LENS) in Cumbria⁷. LENS uses a commodity focus, dairy in Cumbria, to understand the natural assets that exist in water, soil and wildlife (natural capital resource assets) and the risks for stakeholders reliant on these assets in specific landscapes. Such approaches would eventually aim to reach beyond agri-foods to include insurance, building, property etc.

⁵ <https://naturalcapitalcoalition.org/natural-capital/>

⁶ <https://www.cisl.cam.ac.uk/business-action/natural-capital/natural-capital-impact-group/pdfs/the-leadership-compact-committing-to-natural.pdf>

⁷ LENS Analysis of Cumbria <http://environment.bitc.org.uk/smart-water/healthy-ecosystems-cumbria-lens-2>

We need to strengthen the profile and importance of soil. It needs to be integral to the discussion on natural capital. There will be gaps in our knowledge but prioritising it as an issue we can start to address these gaps. This should happen from government to business to farmers. As the UK moves towards leaving the European Union and the government starts to deliver on the 25 Year plan for the environment, natural capital (inclusive of soil) will be integral to enabling broader thinking around payment mechanism and **incentivising good practice** for business, farming and government.

It is fundamental that any collaborative approach includes farmers; they are stewards of the soil and unless they manage their soil's health they will not be able to achieve a sustainable livelihood. This includes crop rotations and increasing the income they get working with business partners through being part of **quality improvement programmes**. The impact on tenant farmers and contractual relationships they have requiring them to maintain healthy soil must also be considered. A metric would demonstrate this, but this could be supported further by a code of practice that advocates better management approaches. Strengthening advisory and regulatory services to support farmers choices to improve soil health, including demonstration farms could help encourage the measurement of soil at farm level to include soil organic matter and soil structure.

Any guidance on soil, whether through a metric or through land management approaches, should be simple and build on existing best practice. This can be reinforced through the implementation of regulations and through the communication of best practice measures on farm e.g. crop cover, no/min till, buffer strips, seven-year crop rotation etc. Businesses can reinforce these messages working through their supply chains, if provided with clear guidance.

Recommendations

1. At a national level, we must account for the economic value and risks of soil. Soil health should be accounted for within the natural capital evaluation, which can set a baseline for data on soil. Accounting for soil at a national level would drive awareness through supply chains and at farm level. Business would need to start accounting for the externalities caused by their value chains and work through their supply chains to mitigate these. Natural capital accounting could support this but businesses can also work collaboratively on stewardship approaches through agreements such as Courtauld 2025.
2. Policy should incentivise good soil management. A replacement for CAP should incentivise payment for environmental services rather than land. Strengthening advisory services on soil at a farm level would support better management practices, these would be strengthened by incentives such as a scorecard systems or sustainability payments. Any policy or incentivisation should take account of heterogenous land types and management models, including best practice for managing rented land.
3. Any metric should be simple to use, with the objective of soils ability to grow wholesome food, energy and fibre with no undue detriment to biodiversity, water or human health. Recommended measures include organic matter, pH, P, K trace elements and soil structure.
4. The UK should harness existing data, supplemented by a coordinated approach to data collection to provide a national picture of soil as a natural capital asset. To support this there needs to be consistent soil monitoring over a variety of metrics, including chemical, biological and physical measures.
5. The soil analysis should be developed with farmers and should provide practical guidance on land management. Working in partnership, government and academia can aggregate this data to provide national level analysis to monitor the long-term state of our soil as part of our natural capital approach accounting.

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This is BITC report, the recommendations of this report capture the discussions of the participants of this group but do not represent the views of individuals or the organisations they represent.

Resources supporting soil testing

<http://www.innovationforagriculture.org.uk/ifa-decison-support-tool/>

<https://www.nfuonline.com/cross-sector/environment/soil/how-farmers-improve-soil-health-all-year-round/>