ENVIRONMENTAL LAND MANAGEMENT

TESTING AND TRIALS

Proposal/idea

Submitted by:

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Please describe your proposal/idea(s) and its key objective(s) (max 300 words)

In answering this please consider:

- Links to 25 year plan
- Evidence or past experience to support this proposal
- Have other options or approaches been considered or tried.

Title of proposed test/trial:

“Trail and test an extensive and long term farm scale biomass to biochar crop rotation model, presented on the ELM’s platform providing a mechanism where public money for public good can be used to deliver the 25 Year Environmental Plan soil objectives, COP21 ‘4 per 1000’ soil carbon obligations and potentially a “carbon farming” farm scale carbon trading model.”

Executive Summary:

Incorporate a biomass element to the existing grass ley/cereal rotation on our 767 Ha organic dairy and livestock farm on the Mendip Hills.

Matured biomass to be harvested, converted into biochar and incorporated into the top soil with the overall objective of increasing the organic carbon content by a minimum target of 0.4% /year.

Trial and test can be started immediately using an existing 146 Ha 18 year old biomass tree planation which requires conservation management. As this plantation is converted to biochar over an estimated 5 to 6 year period it will be replaced by newly planted hazel or willow biomass on suitable selected areas of the farm to ensure a continuous supply of biochar to continue the carbon sequestration process indefinitely. It is envisaged that c. 15% of the total area of the farm will be held within the biomass rotation.

25 Year Environmental Plan Objectives

This project contributes to achieving the specific 25 YEP goal/objective ‘ Using resources from nature more sustainably and efficiently’ as measured by headline indicator No 11 ‘ Production and harvesting of natural resources’ and more specifically System Indicator H29 ‘soil health’ which is recognised as a Natural Capital Asset.

It also contributes to achieving the UK Government COP21 ‘4 per 1000’ soil carbon obligations.

Evidence to support the proposal

A review of the literature will indicate significant evidence that incorporation of biochar into the top soil will result in a significant sustained increase in organic soil carbon levels with a resultant and associated increase in the activity of the soil microbiome and soil humus resulting in increased and sustained plant nutrient availability.

Have other options or approaches been considered or tried?

There is a current programme of improving soil fertility underway on the farm. The land has been managed organically since 2002 and herbal leys/green manure cover crops have been incorporated into the rotation. Whilst these approached have been successful the belief is that the additional inclusion of the biomass to biochar rotation will provide a significant step change in soil organic carbon, fertility and farm productivity. This step change may also give us the ability to consider a ‘carbon farming’ carbon trading model.
1. Please describe what innovation your proposal/idea(s) bring(s) to the new Environmental Land Management system?
In answering please consider:
1. Have you drawn on expertise inside and outside of your organisation
2. Have other options or approaches been considered or tried
3. Cost/benefit
4. Why is this proposal/idea suitable for a test and/trial
5. What would happen if we didn’t test and/or trial the proposal ideas

We believe that the main innovation our proposal will bring to the new ELM system is to incentivise soil organic carbon sequestration in a cheap, effective and technologically simple way leading to a cheap and effective way of reducing greenhouse gas emissions.

The 4 per 1000 (‘Quatre pour Mille’) proposal states that if farming and forestry could increase soil organic carbon by four parts per thousand pa that would be enough to totally offset the annual 16 billion tonnes increase in greenhouse gas levels. We believe that our biomass to biochar model will achieve these levels of permanent organic soil carbon increases (and perhaps more) across the entire farm with the step change opening up the possibility of commercial carbon trading.

Using up agricultural land for the production of biofuels is arguably wasteful, uneconomic and unsustainable and does nothing to help mitigate climate change. We believe that our proposal for ‘carbon farming’ shows how economic incentives to maximise soil sequestration of carbon using biochar can be an effective and low cost solution to lowering GHG emissions.

We have drawn on the expertise of several recognised experts in the fields of soil organic carbon sequestration, use of biochar for achieving same, soil carbon testing and enjoy the support of the experts in the Sustainable Soil Alliance.

At the macro level the estimated cost of current levels of soil degradation to UK plc is estimated to be in the region of £1.2 -£1.4 billion /pa. (majority of this cost is for removing soil from drinking water). In addition there is an individual farm cost due to increased input and reduced output related to poor soil fertility. Proposed test/trial will facilitate a greater understanding of the cost of low organic carbon levels at the individual farm level with the ability to extrapolate increased farm productivity from increased organic carbon levels.

Please see Appendix 1 for a supporting case study based on the Yeo Valley business. This demonstrates how the carbon we will sequestrate can be used both innovatively and locally in a simple carbon trading model.
2. **How does the proposal/idea link in with the 25 year environmental plan objectives? (max 200 words)**

In answering this please consider:

- What specific outcomes will you be targeting/will potentially be impacted? What aspects of your proposals/idea have been informed by the 25 year environment plan?
- What land management practices do you plan to use to deliver these outcomes?
- Have you considered/factored in any potential social/public benefits, as well as the natural benefits within your proposal/ideas(s)?

The specific outcome of the trial/test proposal is to raise the soil organic carbon content of the top 15 to 30 cm of soil by a targeted 0.4% per year initially over a 4-6 year period and to ensure ongoing maintenance at the final achieved level. This increase in soil carbon will contribute to an increase in the activity of the soil microbiome and soil humus resulting in increased and sustained plant nutrient availability, improved soil structure and build up soil fertility.

The 25 YEP has 10 outcome goals of which one is “using resources from nature more sustainably and efficiently. Progress towards these outcome goals is assessed using 15 headline indicators each of which is made up of a subset of system indicators with 1-4 indicators per headline (65 in total).

Unfortunately soil per se is not a headline indicator but is very much included within headline indicator No 11: *Changes in production and harvesting of natural resources.* This headline indicator has four components, the second of which is a ‘composite measure of soil health which underpins the multiple functions of soils and soil health in food production, run off, erosion and carbon sequestration’. System indicator H29 Soil Health is one of the four related to Headline indicator No 11. H29 makes reference to the goal of improving our approach to soil management: *by 2030 we want all of England’s soils to be managed sustainably using natural capital thinking to develop appropriate soil metrics and management approaches.*

We believe that the proposed test/trial speaks directly to the 25 YEP outcome goals and the associated soil headline and system indicators in terms of improving soil health using carbon sequestration and managing soils sustainably.

The possibility of using an incentivised carbon sequestration model may possibly deliver social/public benefits if it was developed into a carbon trading model.
3. **What are the specific risks with the proposal/ideas(s) and what are your plans to control or mitigate against these (Max 250 words)**

The proposal has been so far and will continue to be exposed to the full Company project management process. This is in summary:

- **Strategic positioning paper**: detailing where we want to be regarding our environmental credentials.
- **Short summary concept document outlining a summary of the project and giving us a rough idea of time and resource requirement**. (this document)
- **Business case**: (currently being worked up) detailing the investment required and the environmental benefits.
- **Project plan document**: will detail the delivery approach
- **Project delivery**: keeping the delivery on track
- **Project closure**: have time and cost targets been met
- **Benefits realisation**: have the benefits identified in the business case been achieved.

Throughout these stages risks will be identified that could impact successful completion of the project. For any risks identified at the beginning of the project mitigation activities can be included within the project plan. Additional risks may be identified as the project progresses as identifying risk is a constantly live/routine task throughout project delivery, in this instance resources may need reallocating to prevent a specific risk from happening.

Possible risk areas identified at this stage are project budget, project schedule, technical and hardware issues, procurement and suppliers and business and environmental risk.

Having accessed these areas of possible risk, at this stage of the project we cannot identify any single significant issue that would cause us any major concern, however as stated above as the project delivery process continues we will continue to actively monitor the risk status.