



CREDIBLE
EU carbon farming



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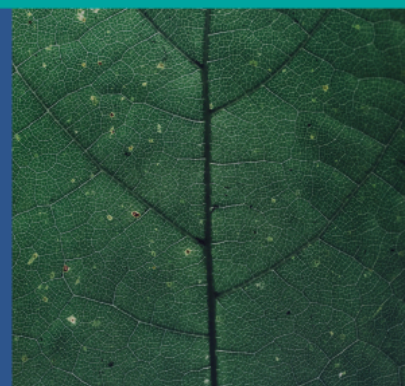
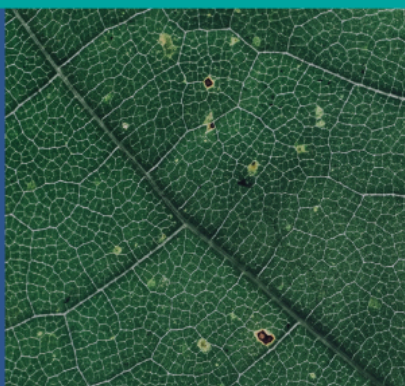
How to harmonise public and private datasets for mapping and monitoring soil carbon dynamics

Project CREDIBLE: “Building momentum and trust to achieve credible soil carbon farming in the EU”.

Funded by the European Union under the Grant Agreement n° 101112951.

www.project-credible.eu

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Executive summary

This document is part of the EU-funded project CREDIBLE, Grant Agreement 101112951, and it captures the main outputs of the first round of conversations had within the Focus Group on “How to harmonise public and private datasets for mapping and monitoring soil carbon dynamics?” (FG3.1).

The main goal of this Focus Group is to establish an exchange of ideas on the topic of the voluntary and regulated carbon farming certifications and their interactions and roles in the support of carbon farming. A barrier in the diffusion of carbon farming is the put in place of a robust system for carbon farming certification, with a public system to certify the private companies which produce and sell the carbon credits certificates. Both by the side of farmers and by the side of the companies, willing to buy those certificates, there is the need to have a publicly regulated certification system. Different systems are currently used for Monitoring Reporting and Verification (MRV), based on differentiated approaches in terms of modelling, analytical/estimation methods, and sampling protocols applied. Every MRV system implies a different level of uncertainty, which is rarely explicitly declared. Furthermore, the data produced by the private sector is usually not accounted for in national reporting due to the lack of a system for data quality, standardisation, harmonisation, and sharing. A EU-wide harmonisation is needed towards a EU-wide system of harmonised national reporting. The objective of the focus group will be to coordinate among different initiatives ongoing on the topic (e.g. EJPSOIL, MARVIC, MRV4SOC, ICOS, eLTER, EUROSOLAN, SOILWISE, BONARES, among others), and with JRC-EUSO, in order to align with the European Commission objectives.



1. Focus Group participation and activities

Table 1 - Partners of CREDIBLE who participated in the Focus Group.

Name of the expert	Affiliation	Role*	Country
Maria Fantappiè	CREA	Leading	Italy
Hannes Mollenhauer	UFZ	Member	Germany
Roberta Farina	CREA	Co-leading	Italy
Panagiotis Tziachris	ELGO	Member	Greece
Vassilis Aschonitis	ELGO	Member	Greece
Jonathan, Atherton	UH	Member	Finland
Emmanuel, Pajot	EARSC	Member	Belgium
Michelle, Hermes	EARSC	Member	Belgium
Tommy, D'Hose	ILVO	Member	Belgium
Tristano Bacchetti De Gregoris	SAE	Member	Spain
Karina Marques	SAE	Member	Spain
Irena Ymeti	UCSC	Member	Italy
Fenny van Egmond	WR-ISRIC	Member	Netherlands
Paulina Rajewicz	University of Helsinki	Member	Finland
Allan Souza	University of Helsinki	Member	Finland

Table 2 - Members of the Focus Group external to CREDIBLE.

Name of the expert	Affiliation	Role*	Country
Arthur Monhonval	Soil Capital	Member	Belgium
Marta Gomez Gimenez	GMV	Member	Spain
Theodoros Tsatsoulis	AUTH	Member	Greece
Pierre Barre	CERES	Member	France
Guillame Lefranc	ACADIAN Plant Health	Member	Canada
Stefano Spotorno	University of Pavia	Member	Italy
Nafissa Sfaksi	MEO-CS	Member	France
Christine Le Bas	INRAE	Member	Europe
Marek Rybar	Carboneg	Member	Czech Republic
Ainhoa Rodriguez	Global Factor	Member	Spain



Anais L'Hote	Idele – French Livestock Institute	Member	France
Nikiforos Samarinas	AUTH	Member	Greece
Greta Formaglio	eAgronom	Member	CZ
Dorice Philbert	AGRICULTURE	Member	Tanzania
Angels Melines	Quality manager	Member	Spain
Chris Ajemian	Verra	Member	USA
Gitanjali Thakur	Research and Technology associate	Member	Luxemburg
Chris Tolles	soil C MRV startup	Member	USA
Daniel Long	The Greenfarmer Coop	Member	Ireland
Juan Antonio Polo Palomino	International Olive Council	Member	Spain
Filippo Iodice	Uptoearth GmbH	Member	Germany
Anton Yarotsky	UAS	Member	Ukraine

Table 3 - List of main activities carried out to steer the conversations.

General description of the activity	Date of execution
Inaugural Focus Group online meeting	20th of December 2023
Discussions with separate FG members	January-March 2023
Meetings concerning preparation for the European Carbon Farming Summit with FG representatives	January-March 2023
Plenary session presentation + panel during the European Carbon Farming Summit	6th of March 2024
Breakout session during the European Carbon Farming Summit	6th of March 2024

2. Introduction

In order to have a coherent Monitoring Reporting and Verification system which could apply at different scales, from the field scale, to the reporting at national and international scale, there is the need for a standardisation and harmonisation of procedures adopted at several levels, starting with procedures, instruments, and protocols adopted in field, passing through the analytical methods and standards adopted, the carbon modelling methods adopted, and finally on the base of the



reporting procedure. Several data is needed, such as soil data, biomass input data, land use and management data, climatic data, possibly proximal and remote sensing data. In order to have comparable and coherent results, there is the need to overcome several technical and legal challenges. Several international research projects and other initiatives, both at national and international scale, are ongoing on the topic (e.g. JRC-EUSO, EJPSOIL, MARVIC, MRV4SOC, ICOS, eLTER, EUROSOLAN, SOILWISE, BONARES, among others). The involvement in the discussion of private stakeholders is also needed to adequately consider practical aspects as well. .

Focus Group 3.1 has centred conversations around three main themes related to MRV: 1. harmonising soil analysis: standards and protocols, 2. enabling soil data sharing, 3. producing baselines – needs and challenges. The three themes are connected in the standardisation and harmonisation effort.

3 Short process report

3a. focus group activities

Focus Group 3.1 has a diverse membership spanning academia (e.g., soil science, proximal sensing, social sciences), farmers, research institutes, and the private sector.

There are currently 37 members in total, both internal and external to CREDIBLE (Table 1 and 2, respectively). The Focus Group kicked off with an online meeting in December 2023. In the first meeting, a Mentimeter was organised. As reported in figure 1, half of the respondents belonged to research and academia, half to private companies (including 2 farm advisors).

To which stakeholders category do you belong?

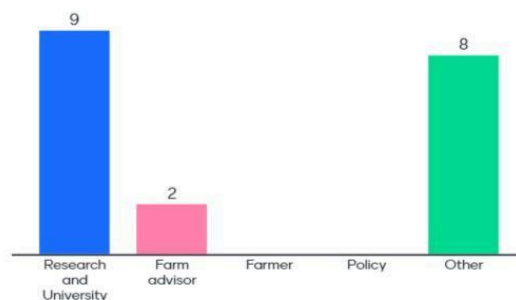


Figure 1. Categories of the participants to the Mentimeter at the meeting of 20th December 2023. Category “Other” reported during the meeting that these members mostly belong to private companies dealing with carbon certification.

Using the Mentimeter, important aspects for enabling the harmonisation of private and public datasets for mapping and monitoring carbon dynamics were also evaluated. The result is reported in figure 2.

Why is important the harmonization of private and public datasets for mapping and monitoring carbon dynamics?
35 responses



Figure 2. Mentimeter answers the question “why is it important the harmonisation of private and public datasets for mapping and monitoring carbon dynamics?” obtained during the online meeting of Focus group 3.1, on the 20th December 2023.

Through Mentimeter we asked the following question: should the European Commission support the establishment of a network of certified soil laboratories applying standard analytical procedures? The result is reported in figure 3.



Should the European Commission support the establishment of a network of certified soil laboratories applying standard analytical procedures?

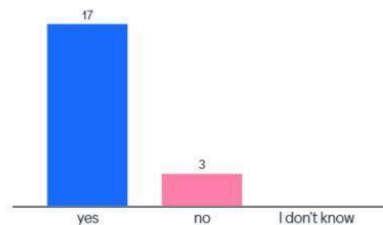


Figure 3. Mentimeter answers to the question “Should the European Commission support the establishment of a network of certified soil laboratories applying standard analytical procedures?” obtained during the online meeting of Focus group 3.1, on the 20/12/2023.

The outcomes of our hitherto work as the Focus Group 3.1. have been presented at the First European Carbon Summit (Valencia, 2024), at a plenary session on MRV and data management. We have also organised a breakout session 5 (BOS5) where the discussions on the three main themes continued. At the BOS5, approx. 70 participants, including representatives of the private sector, including farmers, and academics of different fields. Firstly, we had 5 pitches related to the topic of discussion of the focus group, then, we divided into 3 groups. In all the 3 groups the discussion was focused on answering the 3 questions related to the 3 themes: 1) Should the EU support the establishment of a network of certified soil laboratories applying standard analytical procedures and participating in interlaboratory calibration tests? 2) Which are the barriers, and which could be the incentives for data sharing? 3) Which is your best definition of the term “baseline” in the framework of carbon farming? How should the baseline be determined at different scales and by which procedure/institution?



3b. key discussion points

Section 3.b summarises key points, related to the three main themes, raised and considered by Focus Group 3.1. and discussed during the breakout session at the First European Carbon Farming Summit. Recommendations relating to these points follow in section 4.

Theme 1: Harmonising soil analysis: standards and protocols.

The EU should not impose a list of laboratories and companies who could do the soil sampling and laboratory analyses. Instead, for governing the CRCF, clear guidelines to comply with quality criteria for laboratories and VCM companies should be presented (e.g. to participate in interlaboratory calibration and to adopt standard methods and procedures; SOC measurements should always be accompanied by uncertainty levels). A clear list of minimum quality standards should be published.

The analytical standards adopted should be declared in the metadata and clear guidance should be given on the metadata standard to be applied, to facilitate the publication of all the information needed for interoperability of the data produced.

Reference analytical standards and standard sampling protocols to be applied should be defined, and harmonisation functions towards the reference standard should be defined, that is, transfer functions to transform analytical results from a different standard to the reference standard. Examples of standards: How to measure or derive soil bulk density; Soil sampling depth defined as topsoil (0-30 cm deep); subsoil (e.g. 30-60 cm deep).

The data should be in the same format to be easily shareable. Therefore, tools should be created and made available for standard data sharing. Several databases already exist, but how do we use them, if they are not interoperable (e.g. metadata are not complete with standard methods applied, unit of measure)?

It is expected that the EU registry will only be for carbon credits, not for soil data itself. Bringing the data into the sharing system could be an additional burden for farmers and other stakeholders involved.

IPCC standards may be fine for national and international scale (reporting) but are too coarse at farm scale.

Theme 2: Enabling soil data sharing.



Situation: Several databases already exist but are not shared. There is the need for more global transparency. E.g. farmers have to take soil sampling every 5 years as a requirement (Nitrate directive). Could these measurements be used as a baseline?

- Barriers: the cost for analysing soils, the data anonymity (GDPR issues).
- Possible incentives: Offer compensation for data sharing. Tie data sharing to subsidies.

To incentivize private companies to share their data, the effort of data collection should in large part be subsidised with the support of the EU. The farmer should have the ability to request a subsidy for data collection (such as soil sampling) and hire himself a company to perform the sampling and lab analysis.

- o Showing the results to farmers.
- o To ensure the respect of privacy, the data shared should be maps which show aggregated data (e.g. at country level) However, the model needs data at a fine spatial scale in order to have accurate estimations of carbon sequestration in the soil.

Theme 3: Producing Baselines – Needs and Challenges

On the definition: Carbon removals and emission reductions MRV systems have different scopes, different approaches to baselines. Furthermore, the term baseline is used both for baseline practices (Business As Usual) and for the baseline soil carbon content. This double use creates confusion. We will focus here in the term baseline considered in the meaning of baseline soil carbon content.

Why are baseline soil carbon content maps needed? Question: are we losing carbon in the soil? How do we reward farmers that have already been doing well? While also avoiding farmer shaming?

Challenge of additionality. Having a reference mean soil organic carbon values for each EU pedoclimatic zone, or even at finer scales, in the scenario of Business as Usual at current climatic conditions, could enable valorising those farmers who are already above the mean value.

- Should we rather focus on a qualitative analysis of practices?
- LIFE Carbon Farming project: the baseline was developed by making one assessment per farm and using carbon storage factors per type of surface.



The maintenance of carbon storage should be rewarded. But to do this, you need to know the standard storage performance of the region.

4. Summary of recommendations

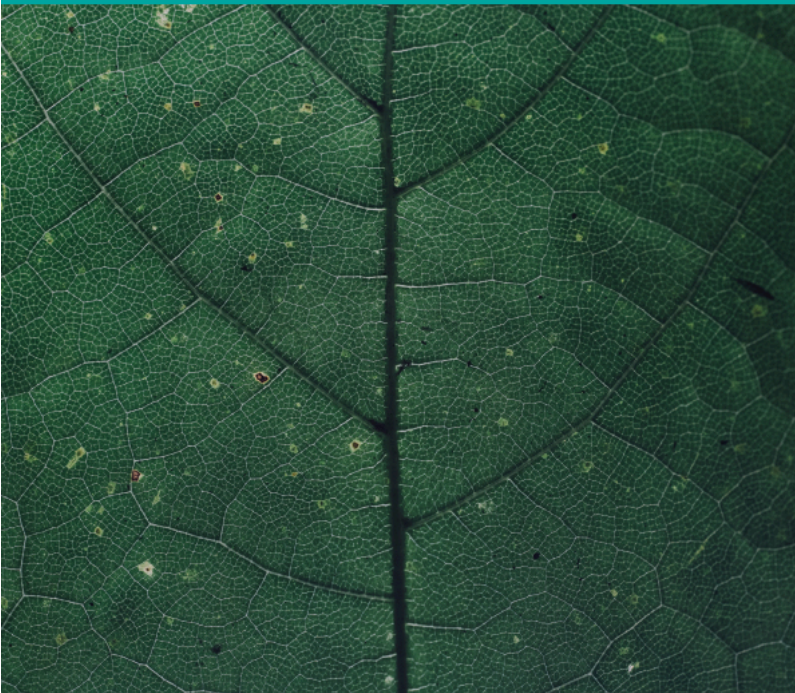
Here we present recommendations based on the key discussion points arising from Focus Group 3.1 that can be used for CREDIBLE carbon farming:

1. The government structure of the EU regulated market should include the requirement to comply with quality criteria for laboratories and VCM companies (e.g. to participate in interlaboratory calibration and to adopt standard methods and procedures; SOC measurements should always be accompanied by uncertainty levels). A clear list of minimum quality standards should be published.
2. The analytical standards adopted should be declared in the metadata and clear guidance should be given on the metadata standard to be applied, to facilitate the publication of all the information needed for interoperability of the data produced.
3. Reference analytical standards and standard sampling protocols to be applied should be defined, and harmonisation functions towards the reference standard should be defined.
4. The data should be in the same format to be easily shareable. Therefore, tools should be created and made available for standard data sharing.
5. To incentivize private companies to share their data, the effort of data collection should in large part be subsidised with the support of the EU. The farmer should have the ability to request a subsidy for data collection (such as soil sampling) and hire a company to perform the sampling and lab analysis.
6. To ensure the respect of privacy, the data shared should be maps which show aggregated data (e.g. at country level). However, the model needs data at a fine spatial scale in order to have accurate estimations of carbon sequestration in the soil.



7. Carbon removals and emission reductions MRV systems have different scopes, different approaches to baselines. Furthermore, the term baseline is used both for baseline practices (Business As Usual) and for the baseline soil carbon content. This double use creates confusion.
8. To overcome the challenge of accounting for the additionality, we suggest to have reference mean soil organic carbon values for each EU pedoclimatic zone, or even at finer scales, in the scenario of Business as Usual at current climatic conditions. These mean baseline SOC values could enable valorising those farmers who are already above the mean value.
9. The maintenance of carbon storage should be rewarded. But to do this, it is required to know the standard storage performance of the region.





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