From carbon neutral cropping systems To Climate Neutral Farms

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ClieNFarms
Climate Neutral Farms

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The project at a glance

”Co-develop and upscale systemic locally relevant solutions to reach climate neutral and climate resilient sustainable farms across Europe”

EU contribution:
€ 11 999 975
Overall Budget:
€ 13 639 536

48 months
1 January 2022

Testing and demonstrating systemic innovations in support of the F2F Strategy.
(LC-GD-6-1-2020)

33 partners &
14 European countries

Demonstrate that **innovative systemic solutions** have the potential to generate positive impacts by 2030

- Achieving climate neutrality of farms and farming systems
  - Reducing GHG emissions
  - Increasing carbon sequestration and storage
  - Consider other climatic effects (albedo change, surface energy partitioning...)

A consortium of 33 partners will interactively integrate and improve existing solutions to achieve economically viable business models in farming systems through a multi-actor approach.

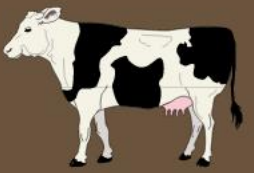
Manure applied to soils

Manure left on pasture

Manure management & housing

Synthetic fertilizers

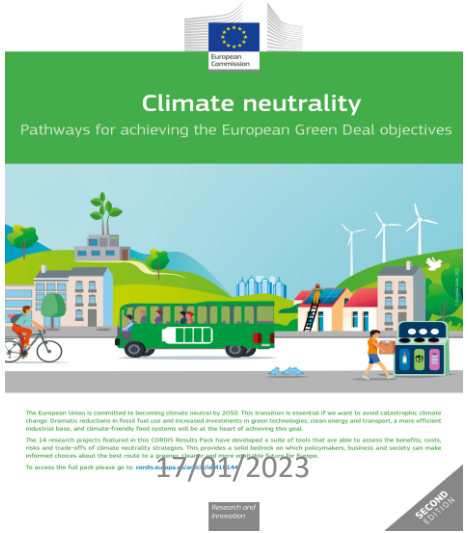
Crop residues and cover crops

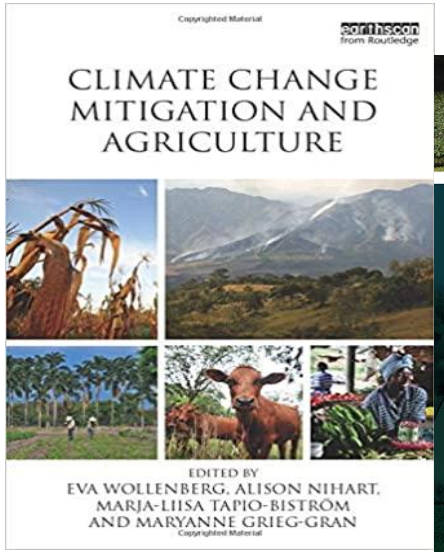


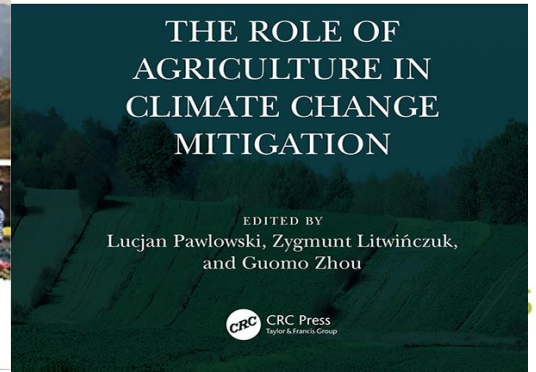
Enteric fermentation

Agriculture is part of the problem

but is also part of the solution!







- CARISMA: **Coordination and Assessment of Research and Innovation in Support of Climate Mitigation Action**
- EIFFEL: **REVEALING THE ROLE OF GEOSS AS THE DEFAULT DIGITAL PORTAL FOR BUILDING CLIMATE CHANGE ADAPTATION & MITIGATION APPLICATIONS**
- LANDMARC: **LAND-use based MitigAtion for Resilient Climate pathways**
- ASFORCLIC : **Adaption strategies in forestry under global climate change impact**
- …

Overall concept

ClieNFarms scope is based on a demonstration approach through the creation of I3S

Innovative

Induces development and adoption of efficient innovation to different elements such as finance; banks; colaborative proposals; etc.

Systemic

Accounts the farm and the surrounding (eco)systems (suppliers; advisers; researchers; etc)

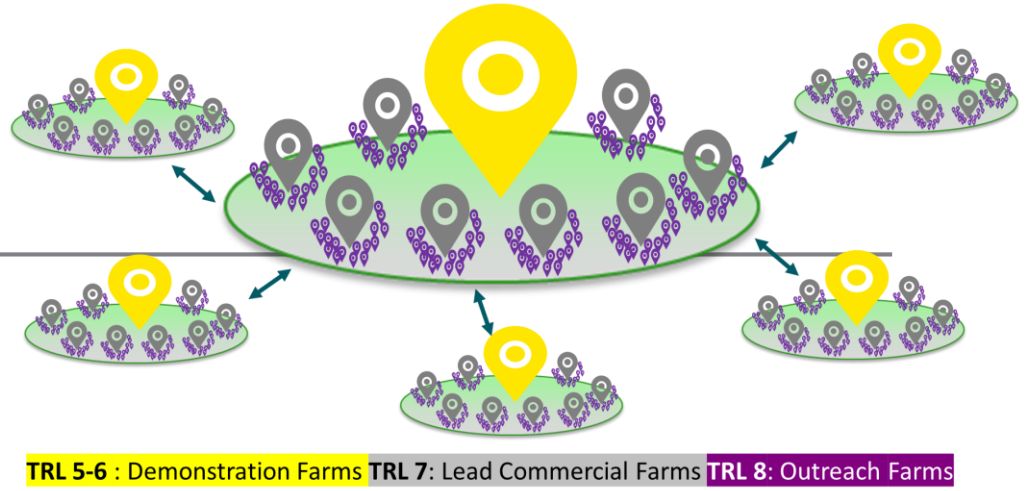
Solution Spaces

Proposes and tailors adapted-solutions based on local conditions (i.e. pedoclimatic conditions, resources and constraints).

Overall concept

The goal of I3S is to develop business models that ensure the financial sustainability of the solutions, with an upscaling methodology.

Farm networks from TRL5 to TRL8



1X

Demonstration Farms (DF)

Farms that are experimental/research sites on which a range of existing solutions will be tested, to reduce GHG emission and increase Carbon storage and sequestration, account for other climatic effects.

10X

Lead Commercial Farms (LCF)

Commercial farms who are pioneers in innovation testing and are well connected to the DFs, contextualizing prototypes in an operational environment.

100X

Outreach Farms (OF)

Network of the surrounding farms of LCFs to dissimenate project results to empower farmers for adoption.

1000X

Replication Farms (RF)

Includes the replication of successful systems through the supply chains that are either local, national or even international.

Bring concept to live

→ *Results gathered in the reservoir*

Policy solutions ←

Synergies with other EU projects, policies and initiatives

WP5

WP1

Existing solutions

Knowledge hub

Catalogue of solutions

Existing		New	
Applicable	Not applicable	Applicable	Not applicable
Already applied / Could be applied		Already applied / Could be applied	

Criteria

Quantified solutions (videos, narratives, reports, socio economic, values)

WP2

consolidated data

Data curation

Models & Tools

Protocols ←

→ *Protocols validation*

WP6

Communicatio, dissemination & exploitation of project results

WP3

Raw data

Creative arena

I3S

Protocols ←

→ *Protocols validation*

→ *Technico-economic blueprints*

Business models ←

WP4

Upscaling the I3S

Carbon certification platform

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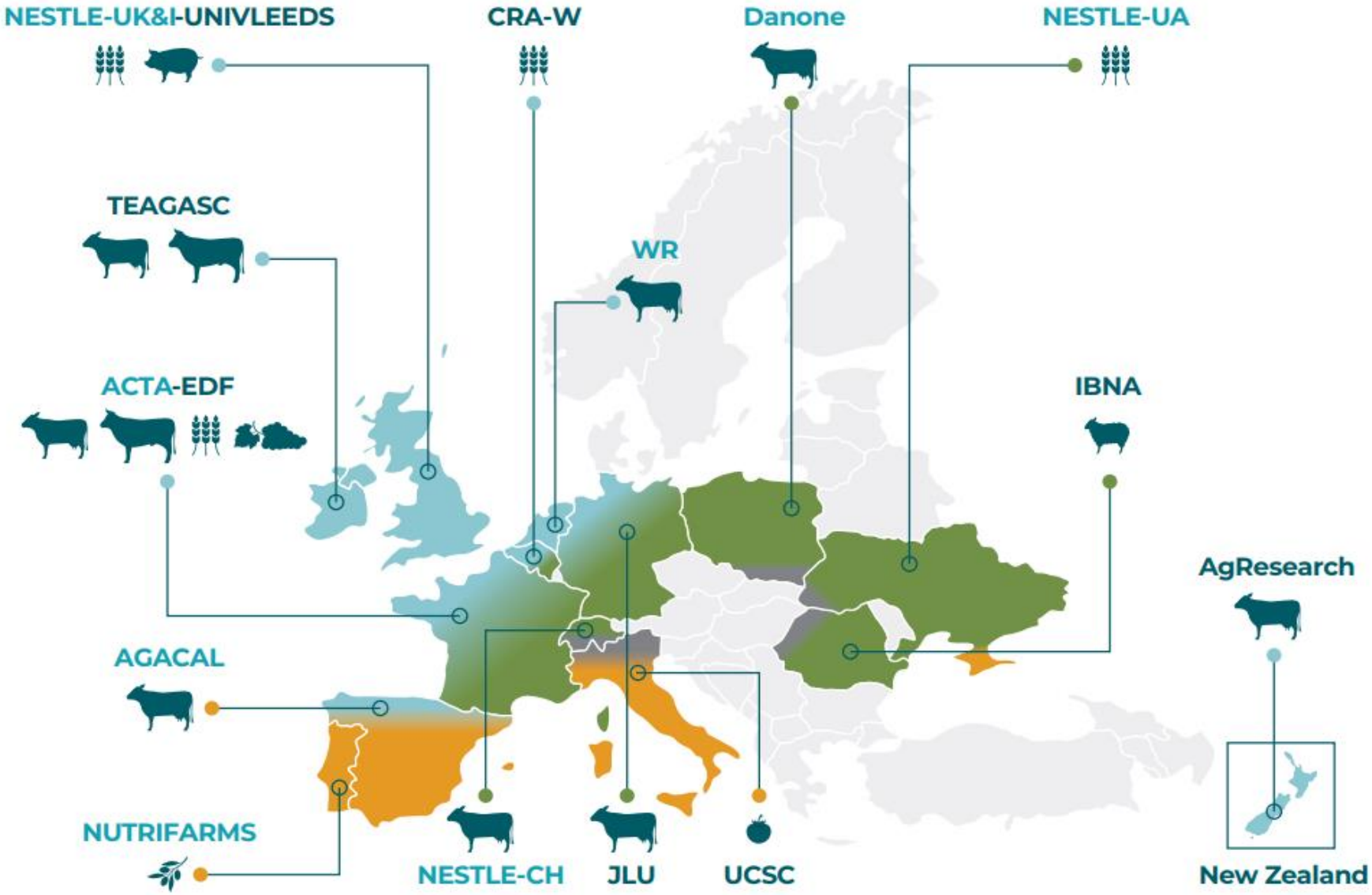


Pedoclimatic regions

- Mediterranean
- Continental
- Mountain
- Oceanic

Production systems

- Dairy
- Monogastrics
- Arable crops
- Specialised culture
- Beef
- Sheep

Partners in charge of I3S
ACTA; CRA-W; UNIVLEEDS; TEAGASC; EDF; JLU; UCSC; IBNA; AgResearch; WR

Supply chain involved
NESTLE-UK&I; AGACAL; NUTRIFARMS; NESTLE-CH; NESTLE-UA; Danone

A holistic approach to climate-neutral and climate-resilient farming

The I3S network is structured around 6 six major themes to investigate and test solutions:

1. **Livestock (including feeds management, animal management, housings, grass management…)**

2. **Crops and special crops (including fertilization, soil management, crops management, specific mitigation practices, crops rotation…)**

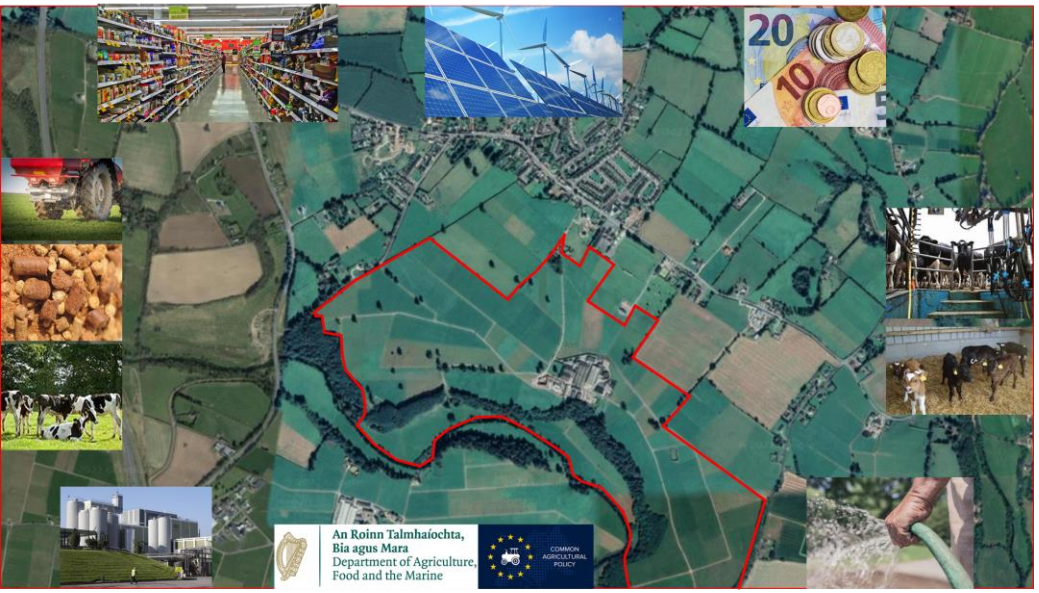
3. **Carbon sequestration (including soil, humic balance, impact of farming practices on soil carbon sequestration, effect of hedgerows, agroforestry, biochar, albedo…), reduction of GHG emissions from soils, albedo effects…**

4. **Low carbon energy production and consumption (including fuel and electricity consumption, biogas plant, wooden chips from hedgerows, photovoltaic…)**

5. **Integral Environmental sustainability (including biodiversity, risk of nutrients leaching, ammonia emissions, soil erosion…)**

6. **Other approaches (including circular organization, governance, territorial approaches, value chain, collaboration with other stakeholders…)**

A short focus on the creative arena



Low impact High uptake potential	High impact High uptake potential
Low impact Low uptake potential	High impact Low uptake potential

- Create collective intelligence
- Empowerment of farmers
- Spark discussion between stakeholder, an appreciation for each other's points of view
- Gather knowledge on how we can help get solution onto farms
- Lessons learnt from the first creative arena can be provided to help other I3S plan their creative arena

workshop 1 - Ideal farm

Activity 1 - Ideal farm using map and post-its – mixed groups

Activity 2 - Ideal farm using solution cards (uptake line and matrix) – mixed groups

workshop 2 – How can stakeholders help farmers to implement impactful solutions

Activity 3 - Barriers and pre-requisites of high impact solutions

Activity 4 - What do farmers need; what can stakeholders offer

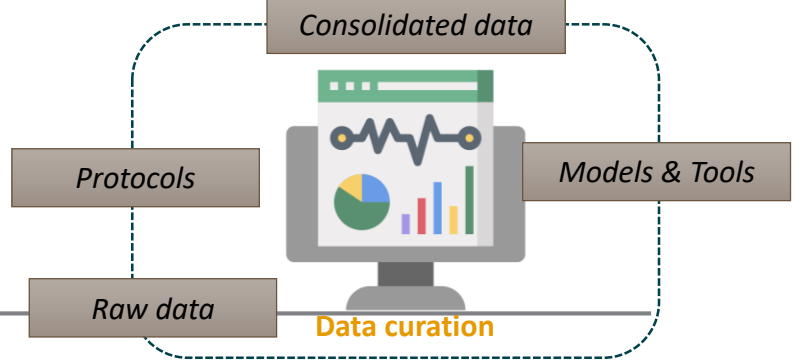
Plenary

Activity 5 - Plenary discussion on how stakeholders can help farmers implement impactful solutions

Activity 6 – How DF can support high impact, low uptake solutions

24th January 2023 at Teagasc, Moorepark,

A short focus on the MRV



- A framework for **carbon sequestration** & GHG reduction in agriculture is under construction at European & international level (certification rules, sources of financement...)

Brussels, 30.11.2022
COM(2022) 672 final

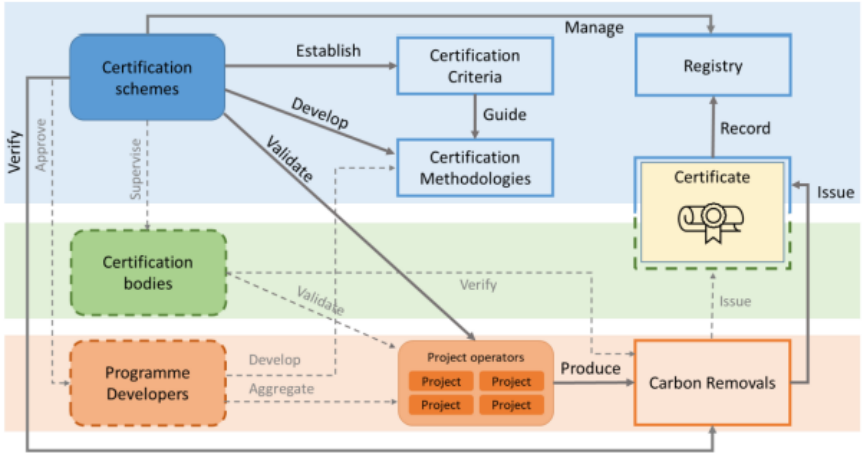
2022/0394 (COD)

Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

establishing a Union certification framework for carbon removals

{SEC(2022) 423 final} - {SWD(2022) 377 final} - {SWD(2022) 378 final}



▪ **Figure 1: organisation et fonctionnement du futur cadre de certification carbone européen**

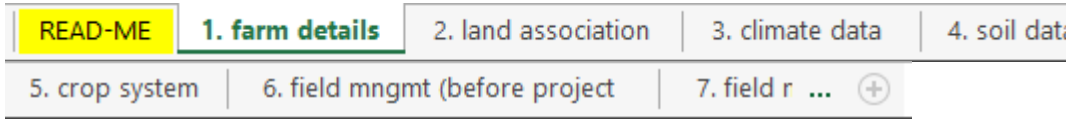
Source : Etude d'impacts sur le futur cadre de certification

QU.A.L.ITY: QUantification, Additionality and baselines, Long-term storage and sustainabILITY

- In this context, and among other things, a methodological framework for MRV is under construction

MRV and predicting

- When designing an MRV scheme, it is important to consider several factors, including **data availability and feasibility.**
  - **Data availability** refers to the amount and quality of data that is available for use in the MRV scheme.
    - It is important to ensure that there is sufficient data available to accurately measure and report on the initiative, and that the data is of high quality and can be trusted.
  - **Feasibility** refers to the practicality and viability of implementing the MRV scheme.
    - This includes considerations such as the resources required to implement the scheme and whether those resources are available, as well as any technical or logistical challenges that may arise.
- Other factors that may need to be considered when designing an MRV scheme **include the goals and objectives of the initiative**, the target audience for the MRV reports, and any legal or regulatory requirements that must be met.



DF → LCF → OF

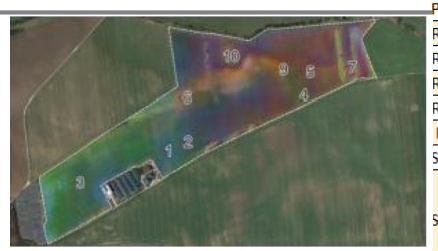
Demonstrate that **innovative systemic solutions** have the potential to generate positive impacts by 2030

MRV requirements that should be considered

There are a number point to be considered when designing an MRV:

1. The **number of models** (tools) being necessary/ used to accurately "measure and report " -> it may be necessary to use multiple models or approaches.
2. **Field sampling versus modeling**: Depending on the goals of the initiative and the resources available, it may be necessary to use soil sampling techniques or modeling techniques (or a combination of both) to measure and report on progress.
3. **Data quality and accuracy**: it is important to ensure that the data used in the MRV scheme is of high quality and accuracy, as this will impact the reliability of the measurements and reports.
4. **Verification procedures**: It is important to have clear and transparent verification procedures in place to ensure the accuracy and reliability of the MRV reports.
5. **Stakeholder engagement**: Engaging with stakeholders such as local communities and government agencies can help to ensure the success and relevance of the MRV scheme.
6. **Legal and regulatory requirements**: It is important to ensure that the MRV scheme is in compliance with any relevant legal and regulatory requirements.
7. Using a **decision tree** can help to make the MRV scheme selection process more structured and systematic, and can help to ensure that all relevant factors are considered.

Not only C and GHG but also biodiversity, water footpring ...



Model/tool name	Partner
MASC	INRAE
MDSM-ERIN	Teagasc
MEANS-InOut	INRAE
MetaModel4p1000 Carsolel	INRAE
MITERRA-Europe	WR
ORCHIDEE	CEA
Precision Sampling	AgriCircle
RFCC	INRAE-CESBIO
RothC	AgriCircle
RothC	WR
RothC calibrated	CRA-W
RothC spatial	UCSC
SAFY-CO2/SAFYE-CO2	INRAE-CESBIO
Simeo-AMG	INRAE-AgroTransfert
SYCI	CRA-W
Systerre	ACTA

Post -doc

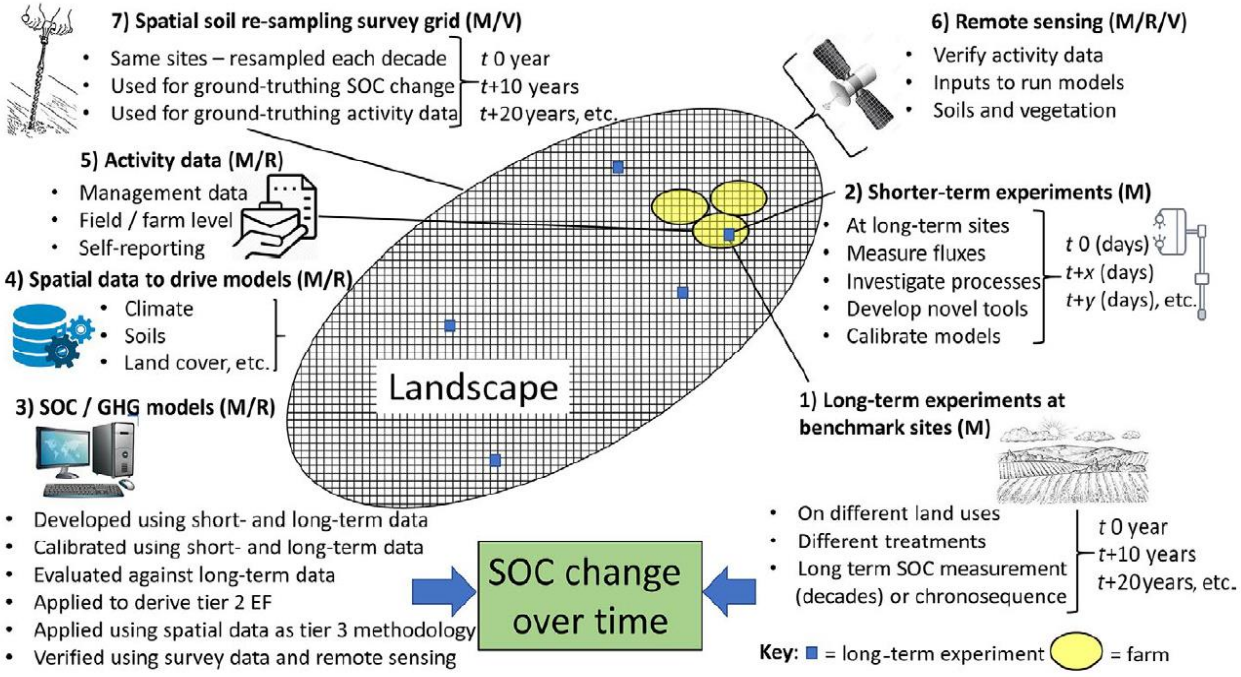
WP5

Informal policy workshop

Proposal of legislative framework for the certification of carbon removals

A short focus on the MRV

Therefore, in strong collaboration with the OrcaSa and Marvic Horizon projects and building on the conceptual framework for Monitoring by Smith et al. (2020)



ClieNFarms will:

- Analyse the current/existing frameworks for MRV at different production systems (duration of the projects, definition of the baselines, levers considered...) ==> towards the proposition of a unified framework,

- Contribute to the development of digital tools for monitoring by :

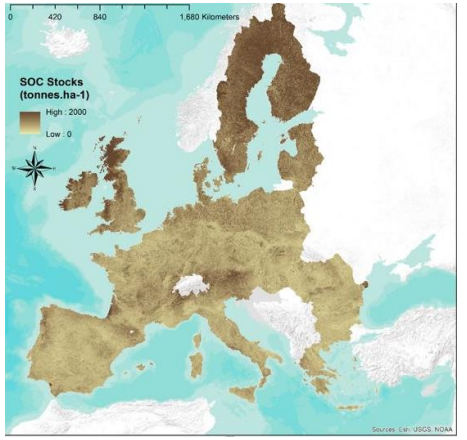
- Analysing the compliance of the current digital tools (e.g. models) with the certification methodologies (literature study) : analysis of strength and weaknesses of current models, needs for further development, accounting or not for key climate mitigation practices ==> proposition of improvement of the current certification methodologies,
- Testing a range of models and implementing them at Demo and Lead commercial farms ==> analysis of minimum dataset needed, data collection, sensitivity and accuracy analysis, ensemble modelling,
- Developing dedicated protocols for data collection at farm level (e.g. soil and vegetation sampling) and best use of new data steams (e.g. remote sensing) for model's input & validation,
- Developing prototypes of digital Monitoring tools for the MRV taking the advantage of new data streams (e.g. remote sensing)

=> increase the accuracy, the scalability and reduce de cost of implementation of Monitoring for MRV schemes

From farm to larger scale

- To have a huge impact need upscaling
- Food processors are part of the project (Nestlé, Danone, Friesland Campina, Nutrifarms)
- Working with them allow to reach a large number of farmers

- Two approaches
  - Spatial modeling (ex Cland)
    - Research approach

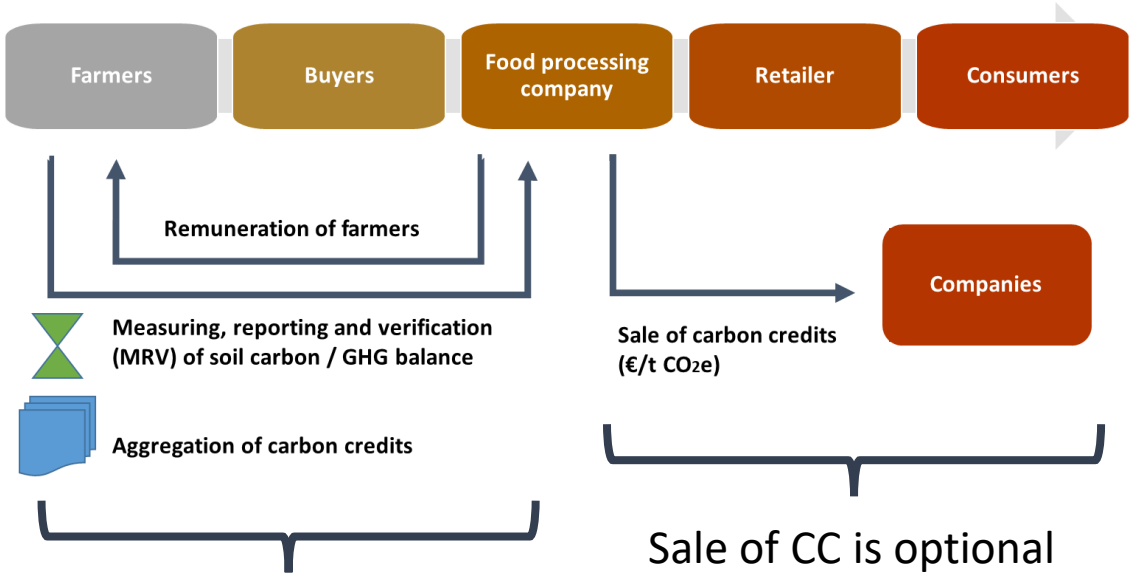


esdac.jrc.ec.europa.eu

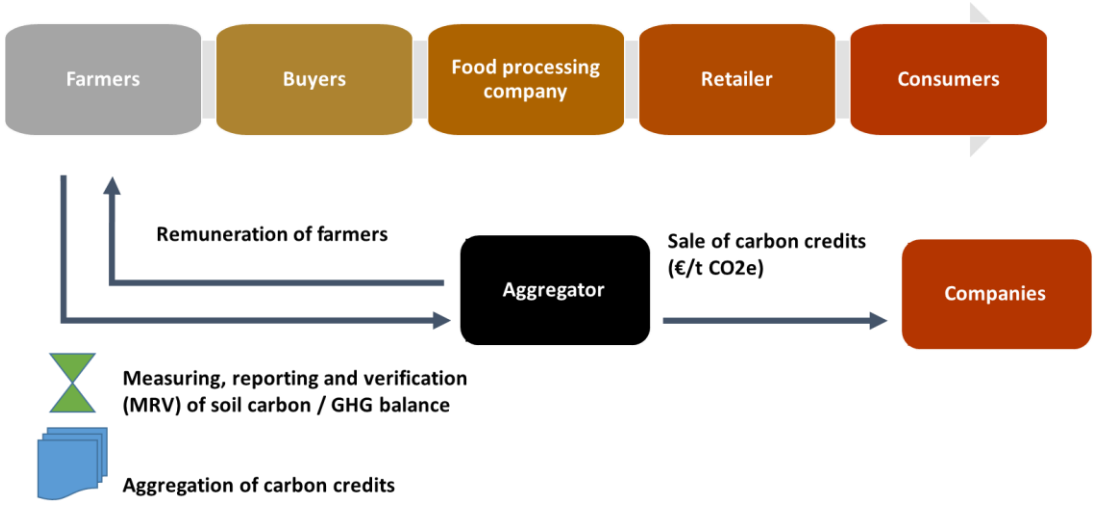
  - Developing sound business models from farms archetypes
    - Operational approach

Examples of Business models

Financing carbon storage by an agri-food company in its value chain



Aggregation of carbon credits by a third party



EU opening through Webinars and Policy Workshops

by ClieNFarms / October 24, 2022

On 8 July 2022, the first ClieNFarms public policy workshop took place online. The topic of the the workshop was climate neutrality and food security in the context of the war in Ukraine.

by ClieNFarms / September 22, 2022

In this 90-minute webinar, six Green Deal projects will present their approaches and solutions to two of the biggest problems facing the agri-food sector: greenhouse gas emissions and food losses and waste: ClieNFarms, ENOUGH, SISTERS, ZeroW, Agro2Circular, and FRONTSH1P.

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https://clienfarms.eu/

Informal policy workshop

Proposal of legislative framework for the certification of carbon removals

24 January 2023, 10:00 – 13:15

EIT House, Rue Guimard 7, 1000 Brussels

In this informal workshop, a small group of invited policy makers and stakeholders will discuss the proposal of the legislative framework for the certification of carbon removals. First, the European Commission will present the proposal. Then ClieNFarms will provide feedback on the proposal based on the experiences in the project. Finally, we will open the discussion for all invited participants to bring in their different perspectives.

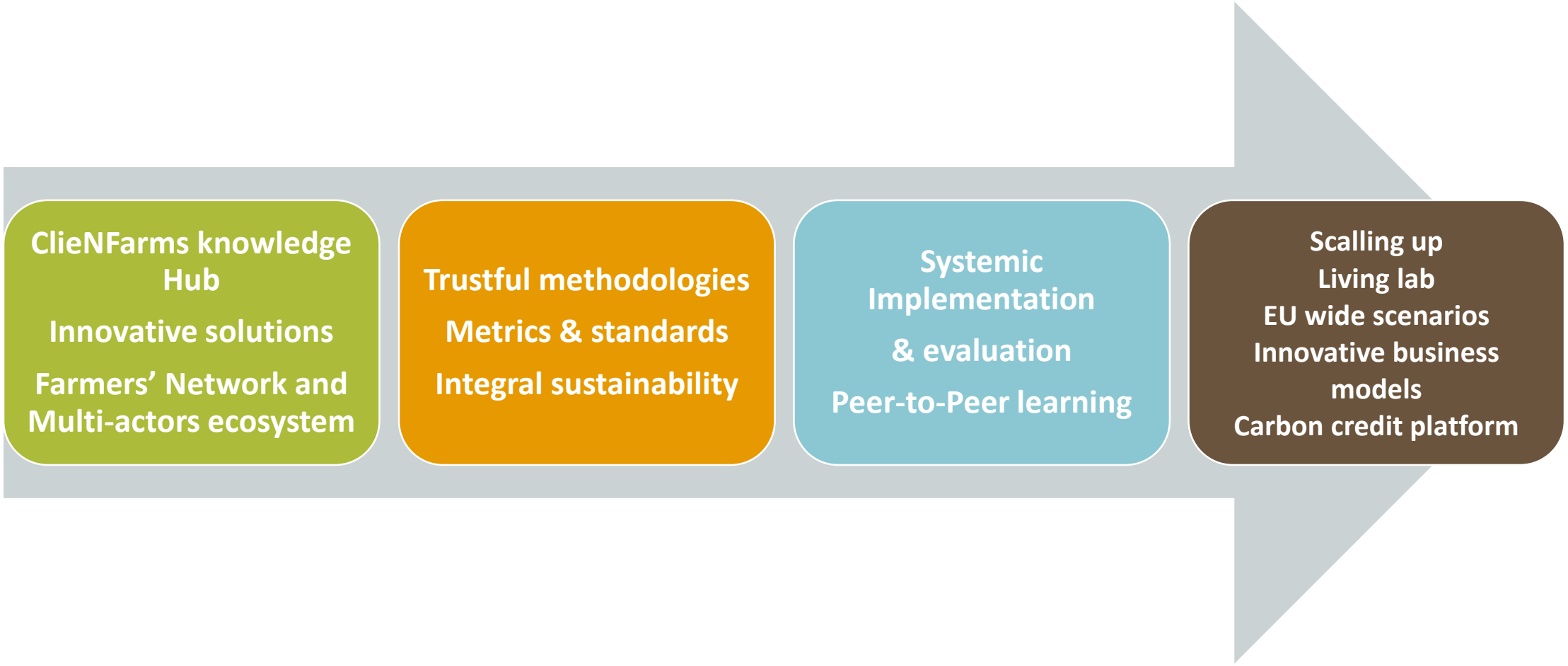
International Advisory Board / Int. Initiatives

- **Dhanush Dinesh**, Europe/international, ex CGIAR, Consultancy science/policy, Clim-Eat
- **Akiko Nagano**, Japan, FAO Programme Officer at Office of Climate Change, Biodiversity and Environment (OCB), and Ministry of Agriculture in Japan
- **Noor Yafai**, Europe/International, Europe Director Global Policy and Institutional Partnerships at The Nature Conservancy
- **Mark Howden**, Australia, Director of the ANU Institute for Climate, Energy and Disaster Solutions, IPCC member
- **Liz Bowles**, UK, Chief Executive of the Farm Carbon Toolkit (FCT), former Director Farming and Land Use at the Soil Association in charge of Innovative Farmers Programme
- **Karen Mapusua**, Pacific/ International, Vice President of IFOAM Organics International
- **Yash Dang**, Australia, Soil and Carbon
- **Marion Verles**, Europe/International, Certification, SustainCert
- **Margaret Bancerz**, Canada, Government, AAFC Agriculture and Agri-Food Canada living labs
- **Luca Urbano**, Europe/ International, Industry, UNILEVER

International initiatives recommended by the IAB:

- Innovative farmers : a 10 years old network of farmers and growers who are running on-farm trials on their own terms.
- Fabulous Farmers : an INterreg project that aims to reduce the reliance on external inputs by encouraging the use of methods and interventions that increase the farm's Functional AgroBiodiversity (FAB).
- Farm Net Zero : farmers work with the partners in order to reduce or mitigate their climate impacts
- Green Climate Fund program: looks at converting major economic production systems to regenerative organic production with a focus on C sequestration, biodiversity, etc.
- Global Soil Partnership : mechanism established in 2012 with the mission to position soils in the Global Agenda and to promote sustainable soil management
- Global research alliance on GHG : bring countries together to find ways to grow more food without growing greenhouse gas emissions.
- farmers for climate action : farmers taking climate action and making themselves heard by media, policy makers and Australians.

General outputs



Expected Impacts

Achieving climate neutrality of farms and farming systems

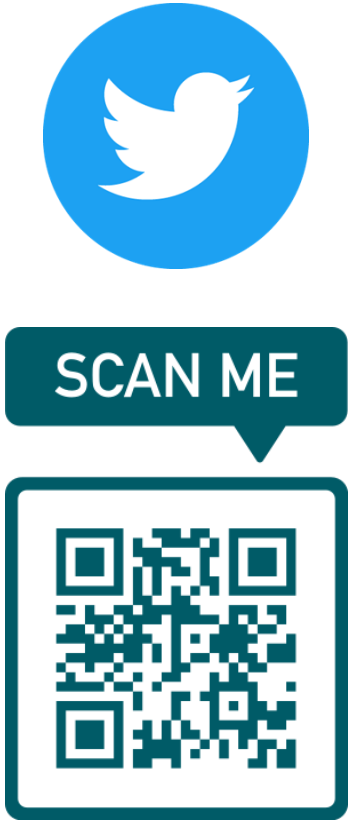
- Reducing GHG emissions
- Increasing carbon sequestration and storage
- Reducing biophysical effect

Providing sufficient, safe, nutritious, healthy and affordable food for all.

Improving the overall sustainability of food systems.

Improving the resilience of food systems to shock and stress.

Follow us on our digital channels!



Thank you for your attention!

ClieNFarms
Climate Neutral Farms

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036822