Technology Acceptance and Transformative Capacity Towards Proximal Sensing Innovations and Digitalization in Carbon Farming

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Focus Group 3.2

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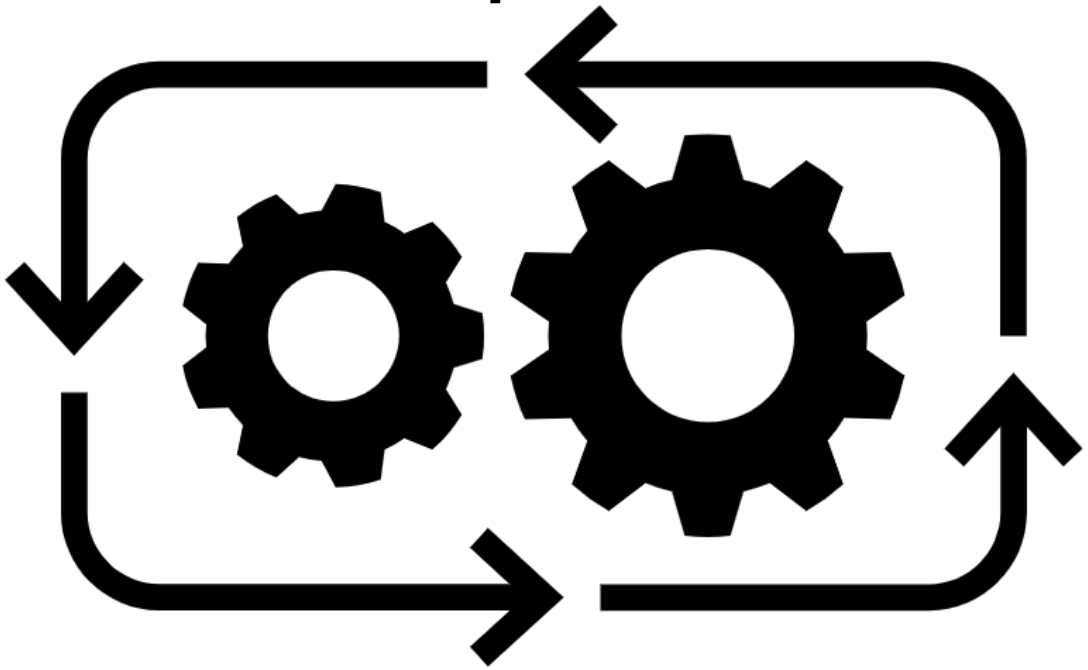
Proximal sensing



Technology acceptance & Transformative capacity

Digitalization

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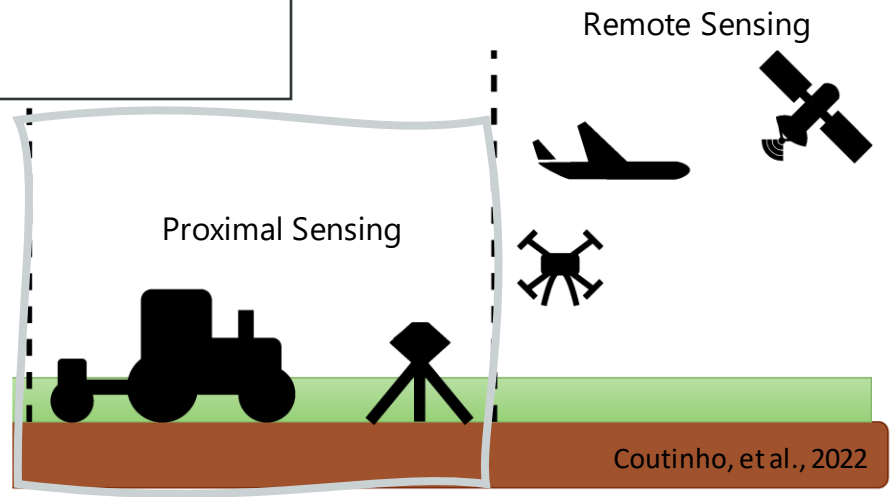
Proximal Sensing (PS)

- the use of field-based sensors to obtain signals from the soil when the sensor's detector is in contact with or close to (within 2m) the soil
- PS techniques can be non-invasive or invasive (ex-situ or in-situ), passive or active, with direct or indirect inference
- PS can be divided into mechanical, electrochemical, electric or electromagnetic, optical or radiometric techniques



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Proximal Sensing innovations in CF: challenges

1. Lack of systematic definitions and standardized methodology

2. Lack of consensus on the approach to accuracy and precision, as well as reporting of accuracy/precision in PS measurements

3. Lack of guidelines on how to compare, connect, and integrate proximal sensing with traditional soil measurements and remote sensing and how to implement proximal sensing into MRV systems

4. Social background issues and other aspects in the PS applicability

Proximal Sensing innovations in CF: goals

1. To collate and evaluate all the currently available PS technologies

2. To deliver a tool for choosing the best-suited PS technology

3. To provide support and guidelines for the smooth implementation of the PS

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Digitalization (DG)

- the process of using digital technologies to transform and improve various aspects of activities, including business or society
- it involves the adoption and integration of digital tools, technologies, and data to enhance efficiency, accessibility, and overall functionality

Data streams from PS systems

Data streams from new sources forced by new legislation

New data streams from increasing automatization

Digital soil mapping

AI

Machine Learning

Internet of Things

Digital logbooks

Data harmonization

FAIR

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Digitalization in CF: challenges

1. Lack of knowledge on the current stage of digitalization at individual farms across Europe and on the possibilities of the implementation of new digital solutions

2. Lack of clear standards for data flow, data management, and data pipelines. Lack of standardization concerning, e.g., computational resources, data quantity, and quality to successfully implement artificial intelligence solutions, including ML and models

3. Lack of procedural guidelines allowing for relatively easy and direct implementation of digital solutions at an individual farm level as well as for utilizing and accessing the digital solutions by land users

Digitalization in CF: goals

1. To survey and evaluate the current stage of digitalization and options for the implementation of new digital solutions in Europe

2. To deliver guidelines on choosing the best-suited digital toolsets

3. To provide support for the smooth and easily-maintainable digitalization

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Technology acceptance (TA)

- a process of overcoming all the various barriers to the adoption of new techniques
- the acceptance might have to take different paths and require different tools in terms of proximal sensing technologies and digitalization

Transformative capacity (TC)

- the capacity of individuals or organizations to navigate within complex multi-crisis settings and situations
- TC is key for addressing climate change impacts, as it refers to the ability for profound and intentional change in response to current challenges and the move toward a more desirable and resilient state

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Tech. Acceptance & transformative capacity: challenges

1. Lack of clear guidelines on new technologies implementation (holistic view need)

2. Fear of involvement due to work overload

3. Issue of communication between carbon credit market players, scientists, digital solution developers, etc., and end-users

Tech. acceptance & transformative capacity: goals

1. To survey and evaluate the current approaches and perspectives towards PS innovations and digitalization

2. To set the language and form of the delivered guidelines (points on PS and DG) within the positive, approachable, and compassionate frame, designed with respect for land user's needs and wishes

3. To support the process of building a platform for communication between various CF system players (both on local and European level)

4. To bring momentum in positive change in approach towards innovations and digitalization

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Proximal sensing

Digitalization | TA & TC

Guidelines for gaining technology acceptance and building transformative capacity in proximal sensing and digitalization for Carbon Farming

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Thank You

Breakout session 6: Proximal sensing and digitalization in carbon farming
Today from **17:10** to **18:40**

Engagement Session 2
Tomorrow from **12:40** to **13.50**

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