AI4SoilHealth

Deliverable 2.2

D2.2 – STAKEHOLDERS ANALYSIS AND MAPPING

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HISTORY OF CHANGES		
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1.0	30.12.2023	• Initial version
1.1	22.10.2024	• Ex Annex 8.1 removed

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1. Executive Summary

The objective of AI4SoilHealth is to co-design, create and maintain an open access European-wide digital infrastructure, compiled using state-of-the-art Artificial Intelligence (AI) methods combined with new and deep soil health understanding and measures. The AI-based data infrastructure functions as a Digital Twin to the real-World biophysical system, forming a Soil Digital Twin. This can be used for assessing and continuously monitoring Soil Health metrics by land use and/or management parcel, supporting the European Commission's objective of transitioning towards healthy soils by 2030.

The project is divided into seven (7) work-packages including:

- (WP2) Policy and stakeholder engagement - networking and synchronising with EU and national programmes,
- (WP3) Soil health methodology and standards - developing/ testing methodology to be used by WPs 4-6,
- (WP4) Soil health in-situ monitoring tools and data - developing field and laboratory solutions for Observations & Measurements,
- (WP5) Harmonised EU-wide soil monitoring services - developing the final suite of tools, data and services,
- (WP6) Multi-actor engagement pilots - organizing field-works and collect users' feedback,
- (WP7) Soil literacy, capacity building and communication - organizing public campaigns and producing educational materials.

Key deliverables include:

1) Coherent Soil Health Index methodology,
2) Rapid Soil Health Assessment Toolbox,
3) AI4SoilHealth Data Cube for Europe,
4) Soil-Health-Soil-Degradation-Monitor, and
5) AI4SoilHealth API and Mobile phone App.

Produced tools will be exposed to target-users (including farmer associations in >10 countries), so their feedback is used to improve design/functionality. Produced high-resolution pan-European datasets will be distributed under an Open Data license, allowing easy access by development communities. AI4SoilHealth will provide an effective Soil Health Index certification system to support landowners and policy makers under the new Green Deal for Europe.

2. WP2 Background

Stakeholder engagement is linked to the project outcomes.
An important objective is to ensure stakeholders are identified and engaged throughout the project in order to promote the **relevance, acceptance, use and uptake** of project outcomes.
AI4SH is a complex project with a potential wide range of project outcomes. The Initial scoping of stakeholders allows the 28 project partners to communicate who they currently perceive to be stakeholders, that the AI4SoilHealth project will i) inform ii) activate, and iii) establish collaboration with.
This report elaborates on how that process is being developed, and will provide a snapshot of those stakeholders identified to date by the project partners. It is expected that this initial process will be developed further at plenary events such as at Bilbao in January 2024.
The second phase of stakeholder mapping and engagement will immediately follow on from that event. This will be an integrated plan for stakeholder engagement and dissemination drawn up in consultation with other Work Packages, centred around defined project outcomes. The plan will take into account the evolving EC policy landscape, and focus on key target audiences and key messages.

2.1. Internal Project engagement

Each project partner has provided contact details of a Responsible Person, to inform and help 'steer' stakeholder engagement. This is necessary to allow for reliable identification of stakeholders already engaged in AI4SH, including Pilot Sites. They are listed at the end of this Interim Report.

These Responsible Persons are responsible for populating the Dynamic Stakeholder spreadsheet for their territory, either independently, or with assistance where necessary. The process, and the Dynamic Stakeholder spreadsheet, is explained in the Methodology section of this Interim Report.

Strategic Roadmap of Project Outputs
A strategic roadmap of project outputs will allow for development of stakeholder engagement within a context of outputs specifically relevant to identifiable external stakeholders.

It is likely that there will be certain outputs that will attract commercial interests and have a consumer focus, with land managers/ foresters anticipated to be the end users.

It is also most likely that the underlying outputs of AI4SH will be of interest to high level policy makers, notably at EU level, with its focus on strategic use of land and soils, and connection to the Proposal for a Directive on Soil Monitoring and Resilience.

These categories of stakeholders will be engaged in the program of fora that are being developed under WP7. There will be a series of workshops, demonstration days, information materials and participative events, including two international open conferences (T7.2), with the aim of: (i) advocacy and influencing activity targeting policy-makers at EU, national, regional and local level

harnessing the policy stakeholder mapping done by WP2 (top-down); (ii) engage with the network of multi-actor stakeholder pilots (WP6)(bottom-up); (iii) expand the outreach of the project's innovations by bringing together internal (project's networks) and external stakeholders to steer interactions and needs sharing among these actors and between top down/bottom-up perspectives and facilitate negotiations to achieve transformative outcomes.

2.2. Example of Stakeholder Engagement (WP6)

Stakeholder engagement and the Pilot Sites.
Schedule of the Pilot Sites.

Country	Organisation	Type	Name	Region
Sweden	Stockholm University	Research		Lomma
Netherlands	Planet Labs	Multi farm cluster	Boermarke-Zeijen	Assen
Finland	Natural Resources Institute Finland	Research	Kotkanoja	South West Finland
Finland	Natural Resources Institute Finland	Research	Toholampi	Western Finland
Denmark	AU	Research data set	7-km grid subset	Danish national soil grid
Greece	Aristotle University of Thessaloniki	Multi farm cluster	Imathia	Central Macedonia
Spain	NEIKER	Research and multi farm cluster		Basque Country
France	INRAE	Research	ACBB-EM	Estrées-Mons
Croatia	University of Zagreb Faculty of Agriculture	Research	The Neretva River Valley	The Neretva River Valley
UK	UKCEH	Research	Plynlimon	Wales
Italy	UniRoma3	Research data set	Roma Capitale	Italy

Process of establishing Stakeholder engagement for the Pilot Sites
As AI4SoilHealth pilot sites were being established throughout 2023, those involved were surveyed by the project (WP6), to collate their geographic and physical features, their management and purpose, and to understand their potential stakeholders at a local level. Pilot site coordinators for AI4SoilHealth then joined one of two multi-actor facilitation workshops to provide them with the tools necessary for multi-actor co-design processes with stakeholders.

The workshops were online interactive sessions offering pilot site coordinators the opportunity to:

- Learn about multi-actor facilitation theory and practice

- Explore why and where multi-actor facilitation is useful for in our day-to-day work
- Identify pilot site stakeholders
- Identify what pilot site stakeholders' information needs are
- Learn how to identify and communicate incentives for your stakeholders
- Learn how to build trust, exchange knowledge, and run effective meetings for stakeholders
- Connect with other participants working on pilot sites across EU member states, Switzerland and the UK

Pilot site potential stakeholders were identified by pilot site coordinators and collated through an interactive metimeter session e.g. local level water boards/authorities, area residents, researchers and their institutions and local policy makers, and their potential future involvement with AI4SoilHealth project in 2024/2025. This process, alongside the results, are included as an Annex to this Interim Report.

At the 2024 General Assembly meeting in Bilbao, pilots' sites coordinators will be included in multiple co-creation sessions, including representing their local level stakeholders' needs in a project workshop that will start the ongoing co-creation and co-design process for AI4SoilHealth physical tools and outputs such as Soil Health Data Cube v1 and AI4SoilHealth app.

Harmonisation of Data from Pilot Sites.

If one uses the metaphor of the construction of a house when describing the AI4SH project, then the foundations lie on a harmonisation of data flowing from the Pilot Sites, and its subsequent application to Living Labs, via the medium of the Soil Data Cube. Once all relevant data from across the project partners' countries of origin is available and consistent, it will be integrated into the open access AI4SH Soil Data Cube for Europe (a key deliverable).

Once the AI4SH Soil Data Cube for Europe has reached a certain threshold, it will be made available to external stakeholders, as an open source application.

At that stage stakeholder engagement will be reassessed in the light of;

1) policy developments at EU level with the Proposal for Directive on Soil Monitoring and Resilience;
2) developments in the research community;
3) and finally with the more general commercialisation of and development of soil management applications, potentially at local land use level.

It is likely then that there will be one group of stakeholders interested in generating commercially available products which will access and utilise the Soil Data Cube.

It is also likely that there will be an interest from high level policymakers interested in seeing how to utilise the data to assist with land use modelling. As David Robinson from Project Partner CEH says

in an interview posted on the AI4SH website **‘The project is generally pitched at a regional to pan European scale where policymakers will be using this information.’**

Bearing this in mind, it becomes easier to develop a prioritisation of external stakeholders once the harmonisation of data from the project partners and the Pilot Sites has been achieved. This is already quite advanced, but not yet complete.

At this initial stage, before harmonisation has been attained, the key emphasis of the stakeholder program should be to identify all of the stakeholders participating both in the AI4SH consortium, but also in the Pilots and Living labs, and communicating the value of working together integrate the architecture of the digital ‘house.’

It is important that the Project Partners (especially those with Pilot Sites in their territory) should populate the Dynamic Stakeholder spreadsheet with all stakeholders engaged in this harmonisation process; and also all those who would have an interest in being informed about the Work Package. This will be an ongoing process throughout the AI4Soil Health project.

3. Analysis Of Key Stakeholder Groups

This section provides an outline about Stakeholder Engagement over the full course of the AI4SH Project.

AI4SoilHealth aims at reaching not just policy-making organizations and scientific researchers, but also ultimately, farmers and landowners. AI4SH will engage with networking with stakeholders and target users, and so we expect that public relations, education and networking will help reach extensive user communities.

We especially aim to reach the following target groups:

- Policy-making institutions e.g. EU and governmental institutions, DG Research & Innovation, DG Agriculture and Rural Development; DG Environment: Activities include: a programme of structured interviews with selected policymakers which will ensure effective engagement with target EU and governmental institutions from the outset; organization of five EU workshops structured around the five soil functions with the aim to contribute to the implementation of current soil-related policies to the elaboration of the future ones PLUS EU workshop to consolidate findings; articles in scientific journals and specialist titles. This group will be target attendees for our two major events.

- Policy support organizations, e.g. JRC / EU Soil Observatory: Activities include - dedicated collaborative tasks across work packages will include meetings and 1:1 engagement plus our wider stakeholder engagement programme of activities.

- Commercial enterprises, e.g. SMEs especially focused on carbon farming, regenerative agriculture, private and public forestry agencies: Activities include - primarily through the multi-actor engagement pilots, and outputs including podcasts, soil health digital campaign materials and involvement in demonstration days across the pilot sites.

- Real soil managers: Activities include - proactive engagement from the project initiation including participation in the multi-actor engagement pilots, inclusion in demonstration events and soil health digital campaign materials. A dedicated activity has been planned to help interpret the more technologically complex elements of AI4SoilHealth's activities to ensure that jargon is limited and learnings, insights and their application are relevant to adoption at the farm, land and forest management level.

- Universities and research institutions; Activities include - involvement of students where possible in all WPs but with a particular encouragement for the data collection and user testing in the multi-actor engagement pilots. Soil scientists will be a target audience for the development of soil health literacy materials. The soil health digital campaign will also include campaign collateral that can be adapted and translated for use across the EU to engage

citizens. The two hybrid conferences planned for will aim to engage a broad cross-section of our target audiences.

These extensive categories of potential stakeholders are included in this Interim Report to highlight the range and ambition of the AI4Soil Health project, once it moves into delivering outputs.

AI4SoilHealth has anticipated the requirement to extensively engage with a wide range of stakeholders throughout the delivery of the project. Their identification through the course of the project will be led by activity in WP2. In conjunction with the multi-actor engagement pilots, a wider network of actors will be actively engaged and encouraged to participate in our dissemination activities. This will help us ensure that target actors are fully aware of the relevance, acceptance and future requirements to utilize the project outcomes.

4. Methodology

4.1. Stakeholder Mapping and Analysis

Dynamic Stakeholder Engagement Spreadsheet.

The first phase of Stakeholder mapping has centred on Identification of key stakeholders, by the project partners.

A Dynamic Stakeholder mapping tool, in the form of a spreadsheet (see Annex 1), has been developed to enable the project partners to perform the following actions;

1) To enter details of internal project stakeholders, such as farms participating in trials, and other research partners, and
2) To identify other stakeholders that they would seek to engage with their project work, and
3) To identify other stakeholders that they would wish to inform about their project work, and
4) To identify other stakeholders that they might seek to collaborate with as their project develops.

The Dynamic Stakeholder spreadsheet, complete with data entry instructions has been disseminated to each of the AI4SH partners. The stakeholder mapping tool was to be completed based on the instructions in the covering letter.

Format of the Dynamic Stakeholder spreadsheet. Although the Dynamic Stakeholder Engagement mapping tool is broken up into 'pages' for each of the project partner's territory, there is an initial section that can be populated with international stakeholders where appropriate.
The other categories;

1.**National and regional policy stakeholders**

(e.g. Agriculture Ministries, …

2.**Research Communities, including universities**.

(e.g.Government Soil Scientists, University Departments, …

3.**Farmers organisations**

(e.g.Farmer Unions, Learning Networks, …

4.**Farmers and Demonstration Farms**

(e.g.Participating farms in the pilots, …

5.**Agro-industry**, e.g. SMEs especially focused on carbon farming, regenerative agriculture, private and public forestry agencies

6. **Laboratories, National Science testing and verification centres**

7.**Non-Governmental Organisations.**

(e.g. Sustainable Soils Alliance, …

Project partners are then asked to give an assessment of the Stakeholders who they identify in the spreadsheet as follows.

Degree of interest and influence in the field/topic
Interest based on accountability – Please provide your best estimate of how responsible this stakeholder is for science policy interface. Greater responsibility corresponds to greater interest.

Key Words on field/topic

Level of Activity (drop down menu; Global, National, Regional, Local);
Scale ranking – please indicate the scale of relevance for this stakeholder.
If this stakeholder is engaged up to EU-scale please, select Global
If this stakeholder works primarily at national scale, select National
and if this actor is primarily sub-national at regional/local level please select Regional or Local.

Level of Influence (Low, Medium, High);
Power based on influence: please provide your best estimate of stakeholder influence using this three-category code: High, Medium, Low (Influence refers to the extent to which this stakeholder can persuade/coerce other to make decisions).
High = This person/group has power of veto, formally or informally so their influence is central to achieving desired policy outcomes,
Medium: Goals could be achieved without their support but not easily,
Low: This person/group can do little to influence the policy outcomes.

At national level, AI4SH partner contacts identify relevant stakeholder organisations who engage with each of the AI4SH policy domains in their country. The project partners identify the key policy stakeholder organisations who have good knowledge, understanding and engagement with the AI4SH policy domains. Where possible, the policy stakeholder organisations with good knowledge and understanding of at least one core policy domain area are to be included. In total 12 country level responses are to be collected covering the range of the AI4SH partner countries and initial input from them is entered into the Dynamic Stakeholder spreadsheet.

The Dynamic Stakeholder spreadsheet is designed to be updated regularly throughout the course of the AI4SH project. Each contributing project partner creating entries can be identified through a tab on the Dynamic Stakeholder engagement spreadsheet

The version of the Dynamic Stakeholder spreadsheet that accompanies this report is indicative only, owing to GDPR restrictions, but does include a populated entry for the UK.

PROGRAM FOR UPDATING THE DYNAMIC SPREADSHEET WITH PROJECT PARTNERS

As with the Stakeholder engagement process with the Pilot Site project partners, input is required from all partners to populate the spreadsheets, and to ensure that stakeholder engagement begins from the local to the national; engagement will not be fully completed by a top down approach, especially with the ambition to link in the project to farmer networks around the Pilot Sites.

We will continue to work with project partners on a one to one basis where necessary to assist with identifying their stakeholders; this ongoing work will accelerate in 2024 as the AI4Soil Health project coheres around outputs. We will prepare a second round of assistance at the optimum time, most likely at the General Assembly. We will use the 'Six Tests for Stakeholder Identification' (The Consultation Institute, London).

- Test: Who is directly impacted? · Whose lives will change as a result of this policy? · Who cannot easily avoid being affected by this policy? · Who will have to change behaviour due to this policy?
- Test: Whose help is required to make it work? · Are there vital individuals or groups in the delivery? · Who will have the ability to obstruct implementation unless co-operating? · Who understands the likely impact of this decision on other stakeholders?
- Test: Who thinks they know about it? · Who has studied the subject and published views on it? · Who has detailed know-how that those implementing the policy should also understand? · Are there individuals or groups that will be perceived as knowledgeable on the subject?
- Test: Who has interest in the topic? · Are there organisations or individuals who think they have an interest? · Has anyone been campaigning about the issue? · Is there anyone publishing or broadcasting views on this?

4.2. Relationship with WP7

Soil Literacy, capacity building, and communications

AI4SoilHealth has anticipated the requirement to extensively engage with a wide range of stakeholders throughout the delivery of the project. From the outset, AI4SoilHealth will be committed to collaborating with the other Soil Health Mission projects and activities with a particular focus on communicating the link between soil health, soil function and environmental services.

The Dynamic Stakeholder spreadsheet will be a valuable resource for the Work Package 7, 'Soil literacy, capacity building and communications.' It will be of special importance for the following

outputs. A series of workshops, demonstration days, information materials and participative events, including two international open conferences (T7.2); with the aim of:

- Advocacy and influencing activity targeting policy-makers at EU, national, regional and local level harnessing the policy stakeholder mapping done by WP2 (top-down);
- Engage with the network of multi-actor stakeholder pilots (WP6) (bottom-up);
- Expand the outreach of the project's innovations by bringing together internal (project's networks) and external stakeholders to steer interactions and needs sharing among these actors and between topdown/bottom-up perspectives and facilitate negotiations to achieve transformative outcomes.

In 2023 WP7 produced a **Plan for Dissemination, Exploitation and Communication**.

Communication starts at the outset of the project and continues throughout its lifespan with the aim to promote the action and inform about the results to multiple audiences. Communication as the broadest term means to reach out to society and explain the research in a way that is understood by non-specialists.

Dissemination is focused on making the action's results public by any means and the process starts only after these become available. Dissemination aims to transfer and circulate knowledge to the ones who can make the best use of it and further build on the project's results to maximise the impact.

Exploitation can only start once the research results are available, but they do not need to be complete and this can be done throughout the project as results become available. It focuses on making concrete use of research results for commercial, societal, and political purposes. Depending on the nature and scope of the project, there is a wide spectrum of results that may be recognised as exploitable, including policy recommendations or standardisation activities.

A key consideration for this plan is ongoing communication activities throughout the lifetime of this project including from launch, and not to limit results to the final outputs at the end of the project. The PDEC identified goals that are specific to stakeholder engagement; the following activities will be mapped across, where appropriate, to the Dynamic Stakeholder spreadsheet, with its multiple categories.

Activity	Target	Outreach	Indicator of success
Press releases on key AI4SoilHealth deliverables inc. project launch.	Two press releases per year.	Circulated to 100 media contacts across EU and international titles.	Each press release featured in 25 media outlets with a combined reach of 10 million.
Social media channels.	Presence on four channels (twitter, YouTube, Instagram, Facebook) @AI4soilhealth account with weekly posts.	Total of 50,000 combined followers by year 4 across all channels.	Growth in reach and shares of social media content during project duration Three-fold increase in shares of campaign materials over duration of project.
Videos, news items and podcasts inc. digital campaigns pack.	Monthly outputs from across the partnership (minimum of one per month). Each multiactor stakeholder pilot to produce two specific outputs to share learnings. Video or blog for each key deliverable over the duration of the project plus content from soil literacy training and campaigns.	2,000 average number of views, 500 downloads and 200 shares.	Reach target for each campaign materials output 50,000 citizens by year four.
Visits to AI4SoilHealth website plus Soil Health Assessment toolbox	One website with new content uploaded monthly	300,000 unique visitors over the duration of the project Soil Health Assessment toolbox made operational serving real users (exceeding 10,000 unique IPs per month)	
Webinars and workshops and demonstration days	Five EU workshops structured around the five soil functions	Up to 50 policy makers attending each workshop Up to 100 individuals attending demonstration days over project duration for each multi-actor stakeholder pilot	Implementation of current soil-related policies

Practice Abstracts	28 practice abstracts *(one per partner)*	500 views, 100 downloads, 200 shares	Average six citations per publication
Peer Reviewed Publications	20 Publications	Average 5,000 views and 1.000 downloads per publication	Average six citations per publication
Policy papers and recommendations	10 policy relevant publications accompanied by two policy briefs	Average 5,000 views and 1,000 downloads per publication 500 views, 100 downloads, 200 shares per policy brief	Soil Health Index methodology cited extensively by EU and nat. agencies in the majority of member and associated states Average six citations per publication
Participation in workshops, scientific conferences, symposia and events	One event attended annually per partner	100 attendees in attendance	Questions raised on the project results and activities 10 new contacts made per event
AI4SoilHealth international open conferences (with hybrid) with other SHM and HEU funded programmes	Two international open conferences	Up to 1,000 delegates registering for hybrid events	Target number of attendees met. Feedback on conference content above 80% satisfaction High levels of engagement received

Reaching target audiences

These target audiences can be identified in part via the Dynamic Stakeholder spreadsheet. Key to reaching the target audiences is identifying the best way to reach them, including the media they consume, the platforms they interact with and what is the best language to use (e.g. English or local, social media or press etc).

Stakeholder Group	Area of interest	Communication needs	Media
Policy Makers and national governments	How AI tools and other measurement indicators can support agricultural policy objectives for net zero, soil health and biodiversity outcomes. Specifically, how can these tools be used to fast-track outcomes by	Evidence they can trust. Good summaries of information that get them up to speed without needing to understand the detail. Case studies which they can point to which	Broadsheet news Social media Policy conferences Influencer networks National and regional policy boards

	enabling land managers to have the confidence to make changes to their practices.	support their policy decisions.	
Farmers / land owners and managers	How new tools can support business decisions in practical ways. Needs to know why measurement is important and what immediate benefits it will bring to the farm/land business. Low risk entry points to new technology and technical support to understand how it can be adapted to their specific business model and land.	Farmer and land manager summaries of our outputs which get to the practical outcomes straight away. Ambassadors of information they can relate to. I.e. Other land managers they trust using this new technology. Peer to peer networks to discuss outcomes.	Social media and WhatsApp communities Video platform like YouTube Farming press Farmer and forestry learning networks Farming and forestry conferences Interest groups Agricultural advice sector Regional and local innovation support services
Soil Scientists and researchers	How can new measurement tools support my research objectives?	Detailed information and data which supports the benefits of new tools. Peer reviewed scientific studies.	Research conferences Social media NGO networks National and regional policy boards
Universities, teachers and students		Step by step learning guides with tiered levels of complexity to match different levels of understanding. Attractive resources which explain the power of measurement for soil health outcomes.	Social media Classrooms Student societies Educational resources Popular digital content platforms
Citizens (general public)	How can good soil health measurement make a positive change in the world around me? What positive stories are out there which explain the relevance of soil health measurement tools.	Simplified, clear and short explanations of the importance of measurement and how it can change the world.	Social media Broadsheet media TV and radio

4.3. Wider Soil Project Partners

AI4SH is one EU project among others working on Mission Soil, and there are significant overlaps with them.

As a consequence, there is considerable opportunity for engagement with stakeholders identified in those projects' Stakeholder mapping inventories, subject to adequate GDPR compliance. To that end, and if we have GDPR clearance, we will also enter in to the AI4SH Dynamic Stakeholder spreadsheet relevant Stakeholders identified from EJP Soil, and these are identified through a different colour coding on the Dynamic Stakeholder spreadsheet.

Although it is beyond the scope of this Work Package 2.2 at this early stage, there could be a benefit of the Soil Health Mission projects collating their stakeholder mapping to ensure maximum impact for Work Package 7 as they develop and cohere around the Proposal for Directive on Soil Monitoring and Resilience.

5. EU Soil Policy Stakeholders - Analysis and Engagement Activities

The vast and diverse soil-related community operating at the European level includes official bodies, frameworks, Missions, programmes, partnerships, networks, task forces, platforms, and initiatives directed to Member States. Instruments such as strategies, directives and incentives support the implementation of soil-friendly practices around and beyond Europe. Through its designated bodies, the European Commission is also involved at a global level, committing to several partnerships that play a significant role in placing soil health at the forefront of global political and policy discussions. Achieving coordination amongst a broad range of policy actors is necessary to create synergies between relevant policies and mobilise resources and funding for soil research and soil management innovation.

AI4SoilHealth's active involvement and engagement with such a large community is crucial to advocating a dialogue between science and soil-sensitive policymaking and to make sure soil research contributes to shaping responsive regulations.

A project snapshot of the soil policy landscape and its main actors identifies carrying out the work Task 2.1 is presented below:

- **The Soil Inner Circle** - vertical actors directly involved in soil regulation and research;
    - Mission Soil – A Soil Deal for Europe and the Mission Soil Platform: A one-stop shop for the Mission's activities
    - Horizon Europe
    - European Joint Programme EJP Soil
    - EUSO
    - EU-driven national and local soil networks
    - Land managers, industries, Non Governmental Organisations and civil society actors at EU level
    - Global Outlook
- **The Bigger Picture** - horizontal actors indirectly touched by soil policies and impacted by soil health who can support a holistic approach to soil policymaking.
    - A web of soil-relevant policies and actors
- **Soil Health monitoring Law: current policy process and actors**

5.1. The Soil Inner Circle – Vertical Soil Stakeholders

Mission Soil – A Soil Deal for Europe

Operating under the EU Research and Innovation (R&I) Horizon Europe Programme, Mission Soil is the beating heart of Europe's actions to lead the transition towards restoring and protecting soils, aiming for 100 living labs and lighthouses to be set up by 2030. Given AI4SoilHealth's need to leverage the Mission's extensive stakeholder network to engage the institutional community with the project's findings, a framing within Mission's governance structure and implementation tools available is mandatory.

Mission Soil's governance framework

- **DG AGRI** - Provides the Soil Mission manager and the Soil Mission secretariat, tasked with Mission coordination
- **DG R&I** – Provides the deputy Soil Mission.
- **Joint Research Council (JRC)** - In charge of the Mission's building block on soil monitoring to develop an integrated EU monitoring system (see Mission Dashboard below). This is one of the hottest topics and is one of the four building blocks of Mission Soil, along with capacity building and knowledge base for soil stewardship, co-creation and upscaling of place-based innovations through support to Living Labs, and engagement with the soil user community and society at large.
- **Mission owners group for inter-service coordination** – Cross DGs programming group including representatives of the DGs CLIMA, ENV, JRC, MARE, SANTE, ENER and MOVE among others, with different levels of involvement. These actors are part of the Horizontal Soil stakeholders whose involvement with Mission Soil is key to implement the Mission's objectives and accelerate Europe's green transition towards sustainable land and soil management.

AI4SoilHealth's engagement

Primary engagement with the leading soil governance framework powers WP2's tasks. Representatives from DG AGRI, DG R&I, JRC, and other soil-relevant actors will be involved in **semi-structured interviews** (also available in an online survey format) through which the project investigates the way current soil-relevant policies address the issues and identify any data gaps that need to be addressed to ensure better soil protection.

Following a meta-analysis of the qualitative data gathered from the interviews and surveys a **Workshop involving EU policy stakeholders** will be organised between February and March 2024 to review and consolidate the policy needs for soil health and the assessment of gaps.

Towards the end of the project, a broader representation of European Commission officers from other DGs and stakeholders representing the wide range of activities and expert groups horizontally involved in soil health policy, will take part in a series of **five EU Workshops (M48).**

The events will be organised around five key soil functions: biomass production, carbon sequestration/storage, nutrient recycling, water filtration/storage, and habitat support. Focusing on ecosystem impacts, benefits, and potential unintended effects on soil functions will help evaluate and prioritize soil health policies and practices,

Mission Soil Platform: A one-stop shop for the Mission's activities

To support the Mission's implementation, the Mission Soil Platform was set up. This one-stop shop provides information on Mission activities, events, and progress and supports the networking of Mission communities. It feeds the roll-out of the Mission and related R&I activities, facilitates collaboration among the Mission Soil-funded projects, and increases awareness about the

importance of soil, the challenges it faces and the solutions that exist thanks to the latest research results.

AI4SoilHealth's engagement

The project is embedded in the Mission and deeply involved in all activities pertaining to the development of Living Labs and Lighthouses and communication and dissemination initiatives related to Mission Soil (WP7). AI4SoilHealth aims to support the Mission Soil Platform by using its media formats and providing inputs for the Mission Soil Newsletter and the Mission Soil Podcasts. Through the project's official media channels and partners' company and personal social media profiles, AI4SoilHealth engages with the Mission Soil Platform's main social media channels, tied to DG AGRI (X: @EUAgri, Facebook: EUAgri, YouTube: EUAgri, Instagram: EUagrifood), using the official hashtag *#MissionSoil*.

Several project partners were present at the Cluster event of projects funded under the EU Mission 'A Soil Deal for Europe', Brussels on the 22-23 March 2023 and at the European Mission Soil Week on 21-23 November 2023 in Madrid (Spain) where they had the opportunity to meet and discuss with different stakeholders (researchers, policymakers, farmers, etc.) the challenges for making and keeping EU soils healthy. Participation in Mission Soil initiatives will continue for the duration of the project.

As part of the project' mapping of EU policy-relevant actors invested in soil matters, the EU online community was scanned to identify the most active and influential profiles that can contribute to bringing the debate about soil online. The aim is to engage the selected institutional "influencers" in AI4SoilHealth's feeding of the science-policy dialogue.

Horizon Europe

Mission Soil is powered by Horizon Europe, the EU research and innovation framework programme which is the main funding instrument for Mission Soil's implementation. Horizon Europe' main mode of operation is through calls for proposals of research and innovation projects which are selected and funded. Since 2021, the European Commission has launched three dedicated Mission Soil calls for proposals and evaluated 120 proposals, resulting in 28 projects with a total EU contribution of €161 million. Mission Soil calls are mobilising and connecting communities working on soil protection (researchers, land managers, industries, etc.). The calls have targeted all four operational objectives of the Mission.

A cluster of Mission projects, including AI4SoilHealth is contributing to the development of robust harmonised, reliable, cost-efficient soil health monitoring, making use of artificial intelligence, remote sensing and Internet of Things and laying the ground for a digital twin of soils as part of Destination Earth. Funded projects are also developing business models for soil health and methods for the monitoring, reporting and verification of soil carbon removals. These activities help generate novel opportunities for diversification of farmers' income (e.g. through carbon farming) and support industries in the creation of soil friendly and climate neutral value chains. The delivery of strategies

and solutions for soil decontamination in urban and rural areas is another important outcome of funded projects with significant potential for follow-up investments.

As regards soil literacy and education, Mission projects are strengthening the skills of soil advisors and promoting citizen science as well as soil education on soils in schools and universities as a contribution to the Education for Climate Coalition. Soil-centered funding opportunities are available also under Cluster 6 'Food, Bioeconomy, Natural Resources, Agriculture, and Environment', which includes 75 new topics in the areas of sustainable food systems, nature-based solutions and biodiversity, and the sustainable development of rural, coastal, and urban areas, among others.

AI4SoilHealth's engagement

Collaboration with other EU-funded research projects on soil is a priority for AI4SoilHealth. Although the main **clustering activities** take place under WP7 (Communication and Dissemination), all other WPs aim to have a close link with the Horizon Europe research community.

On top of joining forces with other projects to enhance awareness of the link between soil health, soil function and environmental services, there is scope for **joint stakeholder mapping and engagement activities** to ensure maximum impact and enhance the science-policy interface carried out in WP2. To this end, AI4SoilHealth has also joined the EU Soil Mission Collaboration Working Group on Stakeholder Engagement across the Soil Mission projects. Also, the project is part of the coordination platform dedicated to all Mission Soil Projects hosted by the InBestSoil project.

Engaging effectively with the **Soil Health Mission living labs and lighthouse farms** from other projects will be a strategic asset for partners coordinating the multi-actor engagement pilots in WP6 To guarantee a solid route for the effective implementation of AI4SoilHealth's tools and services.

The Table below gives an overview of the projects with which AI4SoilHealth is currently either directly involved or establishing synergies and collaboration.

Topic title	Project	AI4 Soil Health
Preparing the ground for healthy soils: building capacities for engagement, outreach and knowledge	PREPSOIL project website	Participation of project partner (AU) in the activities
From knowledge gaps to roadmaps on Soil Mission objectives	SOLO project website	
Validating and further developing indicators for soil health and functions	BENCHMARKS (project website	Twin project – organisation of joint activities
Incentives and business models for soil health	NOVASOIL project website SoilValues project website InBestSoil project website	Participation to the stakeholders engagement activities
Engage with and activate municipalities and regions to protect and restore soil health	HuMUS project website	Synergies explored with the Project Coordinator

National engagement sessions and support to the establishment of soil health Living Labs	NATI00NS project website	Participation of project partner (AU) in the coordination
Next generation soil advisors	NBSOIL project website	
Building the Mission's knowledge repository and advancing the European Soil Observatory	SoilWise (CORDIS)	
Improving food systems sustainability and soil health with food processing residues	DeliSoil (CORDIS), Waste4Soil (CORDIS)	
Soil biodiversity and its contribution to ecosystem services	BIOservisES (CORDIS), SOB4ES project website	
Remediation strategies, methods and financial models for decontamination and reuse of land in urban and rural areas	ARAGORN (CORDIS), ISLANDR project website EDAPHOS project website	
Monitoring, reporting and verification of soil carbon and greenhouse gases balance	MaRViC (CORDIS), MRV4SOC project website	
Network on carbon farming for agricultural and forest soils	CREDIBLE project website	Synergies explored with the coordinator
Foster soil education across society	LOESS project website	
Framework Partnership Agreement for a Living Lab Network Support Structure	SOILL	
Citizen science for soil health	ECHO project website	

European Joint Programme EJP Soil

EJP SOIL is a European Joint Programme on agricultural soil management addressing key societal challenges including climate change and future food supply.

EU Soil Observatory (EUSO)

EUSO aims to be the primary source of soil-related data and knowledge in the EU. It serves as a dynamic platform, offering essential knowledge and data to Commission Services and the soil community for soil protection and restoration. EUSO enhances EU Research & Innovation in soils and increases public awareness of soil significance. Collaborating with EU Agencies like EEA, EFSA, ECA, and Horizon Europe's Soil Mission, EUSO plays a key role in EU policy support. It shifts from mere monitoring to understanding soils, aiding the European Green Deal's soil objectives.

The EU Soil Observatory (EUSO) is establishing a comprehensive dashboard containing indicators that present data on soil-related issues within and, in some cases, outside of the EU. With the EUSO Soil Health Dashboard, the JRC provides a spatial assessment of where unhealthy soils may be located in the EU – and which degradation processes affect them using a convergence of evidence methodology, which spatially combines datasets to highlight the intensity and location of 15 soil degradation processes. The EUSO Soil Health Dashboard will evolve as new scientific data become available (e.g. Horizon Europe's Soil Mission projects) and with the implementation of EU and national soil policies, in particular the recently issued EU Soil Health Law.

AI4SoilHealth's engagement

As a Horizon-funded project producing direct quantitative (and qualitative) data useful to assess soil health, AI4SoilHealth will directly contribute to feeding the EUSO Soil Health Dashboard in accordance with the **Open Science** and open data objectives of the EU. AI4Soil Health has participated actively and contributed to the following EUSO Meetings: data and data management, indicators and soil erosion

True to its name, AI4SoilHealth is particularly committed to using artificial intelligence and other digital technologies (i.e. earth observation) to monitor and predict soil health for farmers and growers across Europe. As such, the project aims to create and maintain an open access European-wide digital infrastructure, compiled using state-of-the-art AI methods combined with new and deep soil health understanding and measures. The debate around Open Science and the regulations concerning the use of AI-generated data is particularly relevant for the project to ensure that farmers and landowners can benefit and take part in the management of a digital infrastructure for soil monitoring.

In this respect, AI4SoilHealth closely follows the regulatory development of the **AI Act**, in terms of the use of data generated through AI and is particularly concerned by the need to strike a balance between data protection issues and regulating access to AI-generated data which can be beneficial to the soil community.

EU-driven national and local soil networks

The European Commission is mobilising and initiating various networks that prepare Member States (MS) for the establishment of the Living Labs (LLs) and Lighthouses (LHs) that feature so prominently in the Mission Soil's implementation plan aiming for 100 living labs and lighthouses by 2030 as a means to promote sustainable land and soil management in urban and rural areas.

Several Member States have set up **cross-sectoral mirror groups for Mission Soil**, featuring various national ministries and local stakeholders. Efforts are underway to strengthen the links between mirror groups and national hubs created by the European Joint Programme EJP Soil.

Overall, improving commitment from the national/regional level is regarded as an important mechanism for leveraging the well-targeted outputs of the Mission's "core" policy actions (as supported via HE Work Programmes) As a result, intensified support for MS representatives in

organising initiatives (beyond HE calls) are underway, especially to improve communication between MS representatives and the Mission Soil Board.

AI4SoilHealth's engagement

The local multi-actor stakeholders' engagement activities carried out in WP6 work towards strengthening the relationship between pilot sites and future Living Labs and creating effective **bottom-up networks** able to implement Mission Soil objectives at national and local levels.

Land managers, industries, Non Governmental Organisations and civil society actors at EU level

Along with the institutional actors involved in policymaking and policy support, the wider European soil landscape also includes representatives of land managers and farmers, networks of industries with an interest in soil, NGOs and civil society organisations and advocacy groups. A selection of the main players is available below.

Representatives of land managers and farmers

- COPA - Committee of Professional Agricultural Organizations - General Confederation of Agricultural Cooperatives
- ELO European Landowners' Organization
- CEJA European Farmers' Association
- European State Forest Association
- Conféderation Européenne des Propriétaires Forestiers
- European Coordination Via Campesina
- Agroecology Europe
- The Council of European Municipalities and Regions (CEMR)
- EUROCITIES
- ICLEI
- Anci Toscana - Humus Project

Networks of industries with interest on soil

- European Compost Network
- FoodDrinkEurope
- European Chemical Industry Council
- Fertilizers Europe
- European Biogas Association

NGOs and civil society organizations and advocacy groups

- European Environmental Bureau (EEB)
- ClientEarth AISBL
- BirdLife Europe
- ECOS European Environmental Citizens' Organization for Standardization (ECOS)

- Slow Food International
- Climate-Kick
- IFOAM Organics Europe - Organic target 4 EU
- European Federation of National Associations of Water Services (EurEau)
- Pesticide Action Network Europe

Global Outlook

The European Commission, and in particular the Mission Soil secretariat, has invested in a broad range of partnerships that contribute to getting soil health high on political and policy agendas around the world, such as:

- UN's Global Soil Partnership
- Global Coalition of Action for Soil Health
- FAO
- IFAD
- UNFCCC
- Global Forum for Food and Agriculture
- Agriculture Innovation Mission for Climate

5.2. The Bigger Picture – Horizontal Soil Stakeholders

A web of soil-relevant policies and actors

Over the past 30 years, the European Union (EU) has implemented a wide array of environmental measures with the objective of enhancing the quality of the environment for its citizens and promoting a high standard of living. EU environmental legislation spans various sectors, including air, water, nature conservation, circular economy, and chemical management.

The study supporting the Impact Assessment of the Soil Health Law (Trinomics 2023) lists 27 EU legislations and funding mechanisms directly or indirectly linked with soil protection and remediation. The recent landing of the Soil Health Law (July 2023) introducing a unified definition of soil health and establishing a comprehensive monitoring framework with detailed indicators, has provided the oversight structure that was missing. Several EC Directorates Genaral have high stakes in soil and are cross-collaborating within the Directive elaboration as the data will be of use for supporting schemes, implementing policies, and strengthening stakeholder engagement activities on climate change, biodiversity conservation, carbon removal, etc.

Apart from DG ENV which is the driving force behind the Directive, synergies are particularly strong and desirable with DG AGRI, DG CLIMA, DG MARE, DG SANTE, DG MOVE, DG ENER and DG CONNECT. In addition, the successful elaboration and implementation of this Directive will require coordination of data coming from different governance levels and diverse types of stakeholders into a comprehensive tool.

Given how soil is a fundamental resource for agriculture, and its health is crucial for food production, biodiversity, and environmental sustainability the Common Agricultural Policy (CAP) incorporates soil health as a key component of its approach to sustainable agriculture, recognizing the vital role soil plays in the broader environmental and economic context of farming. However, soil's elective link with agriculture has also been a weakness. Soil health and soil functions have implications that go way beyond agriculture. As noted in the EU Missions two years on: assessment of progress and way forward Commission Staff Working Document, the scientific discipline of studying soil health (or closely related concepts) has been around for decades, but has mainly focused on agricultural soils and food production. Broadening it up to other soil types and usages has become an urgency!

The over-arching reach of soil has highlighted the need for an integrated, systems approach to soil health. While traditionally, R&I, soil monitoring and policies have largely focused on agricultural soils, Mission Soil promotes cooperation across disciplines and sectors to address all land uses (e.g. agriculture, forestry, urban areas, protected areas, etc.).

According to the Commission Staff Working Document EU Missions two years on: assessment of progress and way forward, Mission Soil's added value within the soil scenario is its potential to "tie together fragmented frameworks, policies, networks, etc. that all cover a specific part of soil health without making connections between topics like experimenting, monitoring, changing incentives, and adapting regulations for soil management practices that affect different ecosystem services and soil health indicators". The same study observes how there has been little policy progress at EU level in this field in the past decades, thus suggesting that the Mission can lead the way for effective policymaking on the topic, in response to the needs for soil protection and restoration that have been identified.

AI4SoilHealth's engagement

AI4soilHealth is determined to help broaden the perspective to make sure multiple actors are involved in approaching soil in a holistic way. To this end, AI4 Soil Health will explore data needs and coherence across soil health-relevant initiatives – in particular:

Soil for food	• Farm to Fork • INMAP "Integrated Nutrient Management Action Plan" • SUR - Sustainable Use of Plant Protection Products • CAP NSP - Common Agriculture Policy National Strategic Plans
Soils as carbon pool	• Climate Adaptation Strategy • LULUCF Regulation on land use, land use change and forestry • Carbon removal - Proposal for a Regulation on an EU certification for carbon removals
Soil for ecosystems and biodiversity	• Water Framework Directive • Habitats Directive • European Biodiversity Strategy • Zero Pollution Action Plan • NRL Nature Restoration Law • EU Forest Strategy • LIFE Programme

Soil in the circular economy	• Bioeconomy Strategy • Circular Economy Action Plan

A **project deliverable** *Policy brief: priority areas and data needs for EU soil monitoring and information systems* will be devoted to mapping and analysing all soil-relevant policies and instruments to help identify policy data gaps and highlight unmet needs. The analysis will be supported by stakeholder consultation activities (interviews, validation workshops, etc.).

In the final part of the project, following an identification of priority areas and data needs for EU soil monitoring and information systems carried out with vertical soil stakeholders (EU officials and representatives' stakeholders from farming, Non-Governmental Organizations and National Advisory Bodies), a series **EU Workshops** will be hosted. To promote a systems perspective and an integrated approach to soil, the events will revolve around five key soil functions: biomass production, carbon sequestration/storage, nutrient recycling, water filtration/storage, and habitat support.

Aiming for a diverse representation from different EC DGs and connected strategic and stakeholders, the workshops will bring together multiple perspectives to prioritize soil health policies and practices, focusing on an all-encompassing view of their ecosystem impacts, benefits, and potential unintended effects.

5.3. Soil Health Law (SHL) – Current policy process and actors

As the premier piece of EU legislation dedicated to soils, the recent directive proposal (July 2023) introduces a unified definition of soil health, establishes a comprehensive monitoring framework, and promotes sustainable soil management and remediation of contaminated sites. The directive is part of the Food and Biodiversity bundle of legislative measures expected to enhance the resilience of food systems and agriculture across the EU.

AI4SoilHealth's engagement

The recent landing of the Soil Health Law (SHL) as a novel policy instrument while WP2 project activities were already underway represented a disruptive event that called for an adjustment of the interview protocol to integrate the directive's perspective and a re-elaboration of certain aspects of the science-policy dialogue on the matter, especially in terms of monitoring requirements.

However, given the high relevance of the SHL for the debate around soil health, in November 2023 AI4SoilHealth issued a **position paper** to provide scientific input and considerations to the ongoing public consultation.

The project warmly welcomed the Soil Monitoring and Resilience Law Proposal but also highlighted possible weaknesses and proposed potential integrations, especially concerning the definition of Soil Districts and parameters in order to acknowledges the need for different spatial and temporal intensity sampling according to the proposed soil descriptors.

Overall, the position paper identifies a lack of clarity regarding the design of monitoring activities within the Soil District designated as fundamental administrative units for managing and reporting soil health. It is crucial to determine whether monitoring within soil districts will follow a standardized pan-European design and protocol. The concern is that if each soil district develops its own monitoring design without a pan-European context, it could hinder the ability to compare data and, ultimately, make monitoring less efficient.

These considerations are in addition to the Scientific Response Document prepared by Wageningen University and Research and signed by the coordinator of the AI4SoilHealth project on behalf of the consortium.

AI4SoilHealth is determined to continue contributing to SHL consultation process in an effort to improve the science policy dialogue over the most suitable soil monitoring practices.

5.4. AI4SoilHealth's Action Plan – Understand, Involve and Engage Soil relevant actors in the EU policy landscape

AI4SoilHealth's WP2 is devoted to feeding the Science-Policy Dialogue on soil health mainly through the exploration and identification of the soil health data needed across policy areas to enable policymakers to meet the current goals set by the Soil Strategy, the Green Deal and subsequent strategies as well as possible future policy goals.

The consultation process with stakeholders at EU level is particularly focused on retrieving the views and needs of actors belonging to both the Soil Inner Circle and the Soil Bigger Picture, in order to identify EU policy issues for which soils are likely to be a contributing factor.

The building of the Science-Policy dialogue follows 3 main stages.

Mapping (June 2023 - September 2023)

The first task involves a short desk review to pinpoint policy areas within the EU where soil plays a contributing role whilst evaluating the impact of initiatives such as the work of JPI soil, Soil Mission Support Project and relevant soil policies and frameworks.

Consultation (October 2023 – January 2024)

Following the mapping of soil-relevant policy areas, the project will zoom in on soil pertinence for different regulatory spheres and geographical areas considering scale, stratification, accuracy, precision, and frequency of soil monitoring data required. The focus is on improving the understanding of soil-relevant policies and identifying data gaps that need to be addressed to ensure better soil protection.

To support this investigation, a series of **20-30 semi-structured interviews** with EU officials and representatives' stakeholders from farming, Non-Governmental Organizations and National Advisory Bodies will take place to identify which kinds of soil monitoring information are useful and relevant to implement in current legislations and to inform the drafting of future regulations.

To complement the interviews, the protocol has been adapted in an online survey format which will allow the collection of further views from selected stakeholders.

Validation (February 2024 – March 2024)

The findings from interviews and surveys will be analysed to:

- highlight the most relevant current and future policy questions for which soil data are needed,
- identify soil data parameters/indicators/characteristics required by different types of policy activities.

Following a meta-analysis of the qualitative data gathered from the survey, a Workshop involving EU policy stakeholders will be organised to review and consolidate the policy needs for soil health and the assessment of gaps. The Workshop will take place between February and March 2023.

Delivery (March 2024 – M48)

The aforementioned activities will lead to the production of a project output to be delivered at the beginning of the project's second year entitled *Policy brief: priority areas and data needs for EU soil monitoring and information systems.*

This foundational policy brief will serve as a basis for the development of a final project policy document (*Policy brief on Innovative policies and economic incentives for soil health)* which will identify innovative policies and economic incentives able to take into consideration the linkage between soil health, soil functions and ecosystem services. The topic will be approached through a systems perspective to scan for innovative policies, land management practices and possible economic incentives able to promote soil health in an integrated way – contributing to multiple objectives set by the EU Soil Strategy and by international commitments (SDGs, UNCCD, UN CBD).

The background for this document will come from:

Impact Analysis

- Assessment of the economic impacts of soil-related policies.
- Evaluation of economic incentives like eco-schemes and carbon farming for their effectiveness in promoting soil health among farmers and landowners.
- Case studies from leading countries in soil health policy and data quality.
- Integration of findings from selected Living Labs (WP5), where applicable.

EU Workshops

Hosting of five workshops to evaluate and prioritize soil health policies and practices, focusing on their ecosystem impacts, benefits, and potential unintended effects. These events will complement the systems perspective to help frame soil health within a wider picture and identify innovative policies and economic incentives that can support sustainable land management practices.

- Workshop Participants
  Aiming for a diverse representation from European Commission Directorates-General (DG ENV, DG AGRI, DG CLIMA, DG SANTE, DG RTD, INTPA, etc.) and connected strategic and expert groups involved in soil health policy.
- Workshop Structure
  Organize workshops around the five key soil functions: biomass production, carbon sequestration/storage, nutrient recycling, water filtration/storage, and habitat support.
  Focus on enhancing current soil policies like the Soil Health Law and shaping future initiatives, like the Nature Restoration Law.

6. Dynamic Stakeholder Spreadsheet – UK example

The Dynamic stakeholder spreadsheet is tailored to each participating country and overarching EU stakeholders. The table below shows the UK example (edited for GDPR compliance).

UK		
International policy stakeholders		
Name of institution	**Level of activity**	**Level of influence**
Welsh Government	Global	Medium
National Resources Wales	National	High
DEFRA	National	High
DEFRA	National	High
Scottish Natural Heritage	Regional	Medium
Scottish Environmental Protection Agency	Regional	Medium
Natural England	Regional	Medium
Natural England	Regional	High
Scottish Government	Regional	High
Met Office	National	Medium
Environment Agency	Regional	High
Environment Agency	Regional	High
Research communities		
Name of institution	**Level of activity**	**Level of influence**
The James Hutton Institute	National	Medium
University of East Anglia	National	Medium
British Society of Soil Science	National	High
Cranfield University	National	High
Lancaster University	National	Medium
CEH (Centre for Ecology and Hydrology)	National	High
University of Leeds	National	Medium
University of Sheffied	National	Medium
University of Cambridge	National	Medium
University of Aberdeen	National	Medium
Cranfield University	National	Medium
Eden Project University Center	National	Medium
Rothamsted	National	Medium
Uni of Plymouth	National	Medium

University of Oxford	National	Medium
Farmers' organisations		
Name of organisation	**Level of activity**	**Level of influence**
National Farmers Union (Scotland)	Regional	Low
NFU Wales	Regional	Low
NFU England	Regional	Low
Tenant Farmers Association	National	Low
Country Landowners and Business Association	National	Low
Nature Friendly Farming Network	Regional	Low
Farmers & demonstration farms		
Name	**Level of activity**	**Level of influence**
Glensaugh Research Station	Local	Medium
Glensaugh Research Station	Local	Medium
Groundswell	Regional	Low
Innovative Farmers	Regional	Low
ADAS	Regional	Low
AHDB	Regional	Medium
	Regional	Low
Agro-industry		
Name of organisation	**Level of activity**	**Level of influence**
Hafren Dyfrdwy	Regional	Low
The Agricultural Industries Confederation (AIC)	Regional	Medium
Agri-tech UK	National	Medium
British Growers Association	National	Low
The Royal Agricultural Society of England	National	High
Innovation for Agriculture	National	Medium
Royal Institute of Chartered Surveyors	National	Medium
Laboratories, National science testing, Verification centers etc.		
Name of organisation	**Level of activity**	**Level of influence**
NRM Laboratories	National	Medium
Safe Soil UK	National	Medium
Soil Bio Lab	National	Medium
Solvita	National	Medium
Forest Research	National	Medium

Ordnance Survey	National	High
NIAB	National	Low
NGOs		
Name of institution	**Level of activity**	**Level of influence**
UK Soils	National	High
Sustainable Soils Alliance	National	High
Greener UK Coalition	National	Medium
LEAF	National	Low
Friends of the Earth	National	Medium
Agricology	National	Low
RSPB	National	Medium
National Trust	National	Medium
National Trust	National	Medium
Institute of Environmental Sciences (IES)	National	Low
Wildlife and Countryside Link	National	Low
West Country Rivers Trust	Regional	Low
FWAG	Regional	Low
Broads Authority	Local	Low
CIEEM	National	Low
UKSO (UK Soil Observatory)	National	High

7. Conclusion

The results of this initial WP2.2 stakeholder engagement exercise provides a clear description and categorisation of the policy stakeholders that need to be engaged by the AI4SH consortium. This is the initial scoping of the stakeholder landscape, and it will be supplemented and developed through 1;1 engagement with policy makers; and with Project Partners throughout the course of the project.

Already at this initial stage this mapping exercise has provided insight into the stakeholder organisations within EU member states and the UK. This information will be augmented throughout the AI4SH project term, and already provides a basis for targeting future dissemination activities. Overall, it is anticipated that AI4SH will engage with all relevant stakeholders directly involved in the soil related policy cycle. Many of the stakeholders already mapped are involved in the creation and conceptualisation of polices and involved in clarifying the objectives and goals of the outputs being created. By engaging with these stakeholders, the outputs of the AI4SH Work Packages could be disseminated to organisations quickly and effectively. Further mapping of stakeholders in the commercial and land management categories will be undertaken in future activities, as the project outputs are developed.

The knowledge obtained from stakeholder mapping and analysis activities will also provide the basis for wider communication by the consortium and projects. Improved targeting of information and recommendations for policy to the specific audience will ensure more effective communication across the science to policy interface.

Understanding the roles, power and interest of these stakeholders will help to provide a clearer plan of action for the dissemination program outlined in Work Package 7. By analysing the key stakeholders in the AI4SH partner countries and understanding their roles the project partners will be able to navigate this science-policy interface with greater success and allow AI4SH to be recognised as a source of relevant scientific tools that are both capable of commercial development, and also key to supporting future policy.

Although it is beyond the scope of this Work Package, there could be a benefit of the Soil Health projects collating their stakeholder mapping to ensure maximum impact. In conjunction with the multi-actor engagement pilots coordinated in AI4SH, a wider network of actors will be actively engaged and encouraged to participate in our dissemination activities.

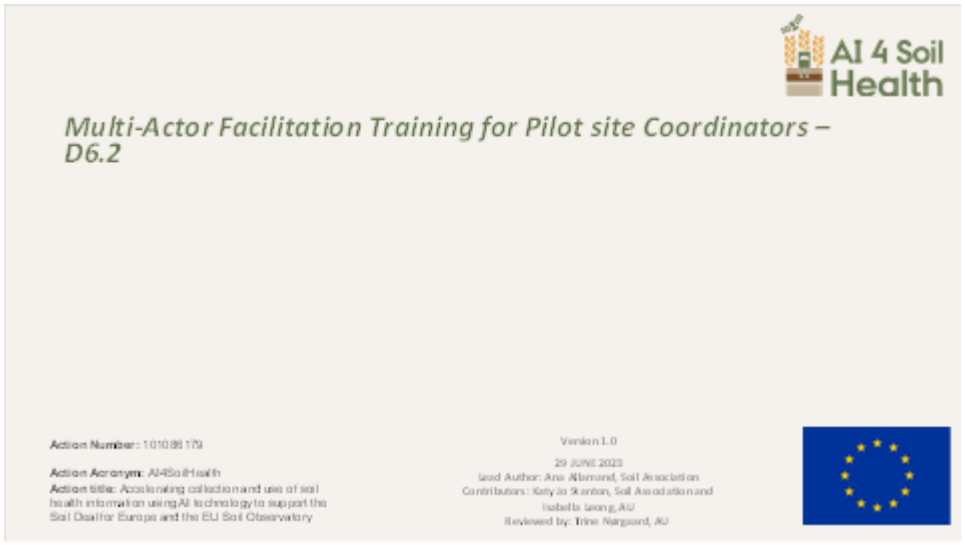
From the outset, AI4SoilHealth will be committed to collaborating with the other Soil Health Mission projects and activities with a particular focus on communicating the link between soil health, soil function and environmental services. The effective engagement with the Soil Health Mission living labs and lighthouse farms will be a strategic priority for the partners coordinating the multi-actor engagement pilots to ensure a strong pathway for implementation of the soil health indicators and AI4SoilHealth tools and services.

8. Annexes

8.1. Annex 1 - Dynamic Stakeholder Engagement Spreadsheet

Country Name									
International policy stakeholders									
Name of institution	**Stakeholder**	**Position**	**Contact mail**	**Contact (tel, link)**	**Degree of interest and influence in the field/topic**	**Key words on field/topic**	**Add.info (link to institution, organisation)**	**Level of activity**	**Level of influence**
Research communities									
Name of institution	**Stakeholder**	**Position**	**Contact mail**	**Contact (tel, link)**	**Degree of interest and influence in the field/topic**	**Key words on field/topic**	**Add.info (link to institution, organisation)**	**Level of activity**	**Level of influence**
Farmers' organisations									
Name of organisation	**Stakeholder**	**Position**	**Contact mail**	**Contact (tel, link)**	**Degree of interest and influence in the field/topic**	**Key words on field/topic**	**Add.info (link to institution, organisation)**	**Level of activity**	**Level of influence**
Farmers & demonstration farms									
Name	**Stakeholder**	**Position**	**Contact mail**	**Contact (tel, link)**	**Degree of interest and**	**Key words on field/topic**	**Add.info (link to institution,**	**Level of activity**	**Level of influence**
Agro-industry									
Name of organisation	**Stakeholder**	**Position**	**Contact mail**	**Contact (tel, link)**	**Degree of interest and influence in the field/topic**	**Key words on field/topic**	**Add.info (link to institution, organisation)**	**Level of activity**	**Level of influence**
Laboratories, National science testing, Verification centers etc.ratories, National science testing, Verification									
Name of organisation	**Stakeholder**	**Position**	**Contact mail**	**Contact (tel, link)**	**Degree of interest and influence in the field/topic**	**Key words on field/topic**	**Add.info (link to institution, organisation)**	**Level of activity**	**Level of influence**
NGOs									
Name of institution	**Stakeholder**	**Position**	**Contact mail**	**Contact (tel, link)**	**Degree of interest and influence in the field/topic**	**Key words on field/topic**	**Add.info (link to institution, organisation)**	**Level of activity**	**Level of influence**

8.2. Annex 2 - Multi-Actor Facilitation Training For Pilot Sites (D6.2)



AGENDA

- Housekeeping
- Introductions
- Why cocreation and how to make it happen?
- Mapping and understanding your stakeholders
- Main takeaways
- Next steps

Introductions

Rename yourself!
1. On the Zoom in-meeting controls, tap Participants.
2. Tap your name, then tap Rename; a pop-up box will appear.
3. In the pop-up box, enter your display name.
4. Tap Done.

Let us know

- Your name and organisation
- Where your pilot site is located and what are its goals
- What do you expect to learn/understand/get from this workshop?

Co-creation: is it really a thing?

Elinor Ostrom, Nobel prize winner, economics, 2009

Wrote: Governing the Commons

Key insight: services are co-produced by both paid and unpaid labor. Each help the other to do their work effectively, and jointly they produce the service that is needed.

Main takeaway: Co-creation/ co-production is a situated and socially constructed process.

This has implications for your work in multi-actor engagement activities!

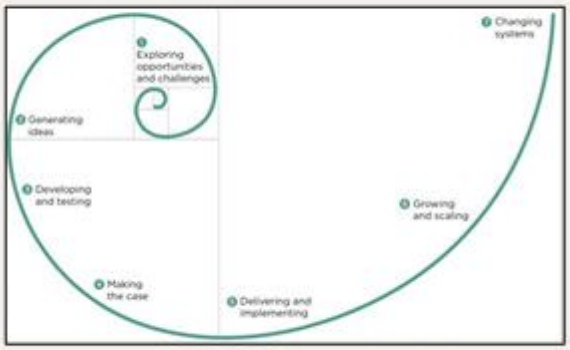
Why co-innovate?

Relevant research That changes the world!	Growth mindset That supports business resilience
• Addresses important issues for users • Collaboration/bigger picture in mind • Asks a simple questions • Questions assumptions • Result orientated	• Searching for new ideas • Stepping back and assessing • Looking at other enterprises • Embracing change when relevant • Wanting to improve • Independant

Benefits and challenges when coming together

Benefits	Challenges
Access to broad network – expanding network – new ideas and knowledge	Finding actors that share your ultimate goal and vision
Access to skills and expertise you don't have/need	Identifying and "sourcing" missing / required skills
Intro to new projects/opportunities	Accessing relevant networks
More or new funding to do what you had wanted to do	Finding appropriate funding

The Innovation Spiral



Co-creation: basic principles

Trust building

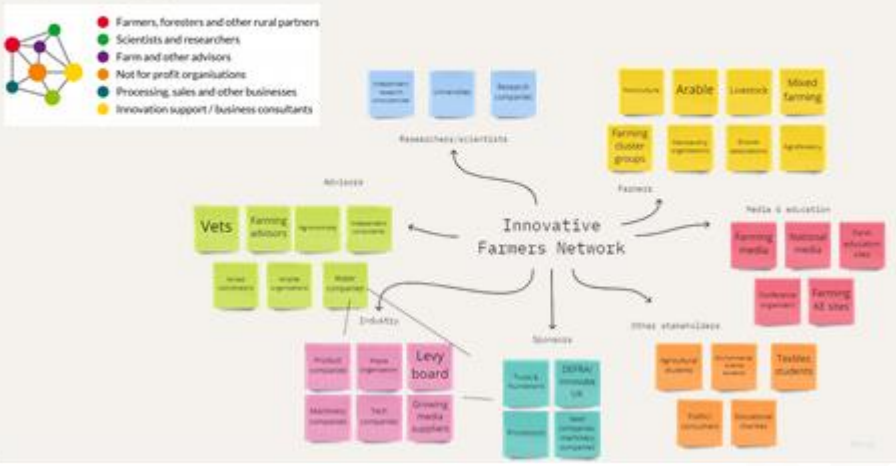
Horizontal (power balance)

User driven but welcomes a variety of knowledges, all equally valuable

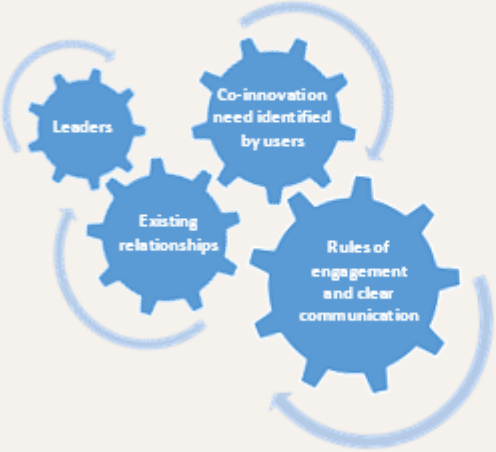
Everyone in an innovation partnership has something valuable to bring to the project. It is important that each member understands the unique contributions that all individuals bring.

Special focus should be given to addressing differences in how each member likes to work. When professional disciplines vary, for example between researchers and farmers, take time to consider the best ways to work together from the start.
For example, staying on farm can be more comfortable for farmers, but researchers may feel unfamiliar with the interruptions of a working farm and this might disrupt their ability to work effectively.

Exploring your networks



Factors which enhance co-innovation and partnerships



- *Clear participation and engagement rules*
- *Clear dates: to meet, to share*
- *Clear & effective communication channels*
- *Specific roles*
- *Finding champions*

Figure 1: Partnership agreement checklist

Creating an agreement, no matter how informal, is good practice as it means everyone can be clear about what they have signed up to do and their role in making it happen.

It also provides a clear plan which, although it can be revisited, provides direction.

This checklist can be used to ensure that a partnership is operating as effectively as it can.

Factors which can hinder co-innovation and partnerships

FUNDER REQUIREMENTS

- Demanding reporting duties
- Administrative burden

CAPACITY TO DELIVER

- Performance issues
- Conflicting workloads
- Lack of confidence
- Staff changes
- Limited resources and capacities

GROUP DYNAMICS

- Failure to address differences or disagreements
- Lack of confidence by some partners
- Lack of motivation of some participants
- Diversity and inclusion challenges

COMMUNICATION

- Managing expectations
- Misunderstandings and miscommunication
- Recording – data and observations, time etc

Checking with the team on regular basis allows you to address these challenges before they reach breaking point!

Tracking and monitoring

- *Given the interaction of multiple actors, evaluation plays an even more central role in assisting decision-making throughout the partnership/project's life*
- *On-going evaluations on different areas are critical to make sure the project moves forward effectively:*
  - *Timeline assessments, around project milestones and goal achievements*
  - *Group self-assessment to ensure a healthy partnership*
  - *Members' self-assessments, to ensure effective participation and leadership*
  - *Skills and role assessments, to make sure the right skills are on board throughout the project's life.*

Disseminating your innovation

To get your ideas and results out, make sure you engage with wider audiences. Remember, you can start anytime... starting at the very beginning!

To do so:

- *Explore your networks*
- *Ideas cross-pollination: engage farmer champions through your project's life*
- *Translate jargon*
- *Journey mapping and impact stories*

Impact: Scaling up, scaling down and scaling deep

How far and wide do you want the outputs of your dissemination activity to go?

Moore et al. (2015) identified three approaches for achieving impact ("scaling") from social innovations: "scaling up, scaling out, scaling deep".

- *"**Scaling up**" is about increasing the number of people who are influenced to adopt a new practice or technology.*
- *"**Scaling out**" refers to changing institutions at the level of policy, rules and law.*
- *"**Scaling deep**" involves changing relationships, cultural values and beliefs.*

Types of scaling, from Moore et al., 2015

Challenges to uptake and impact assessment

Understanding the challenges can help you strategize to overcome them:

- *Difficulties in changing people's mindsets in supporting change*
- *Economic benefits can be easier to assess than other benefits, limiting uptake*
- *It might be hard to recognise and appreciate the value of an activity to the wider community*
- *Individual members might struggle to see the value of their personal role in contributing to address big problems (like climate change)*
- *Actors may struggle to see the value in working together*
- *Legal constraints*

Uptake: make a case for your innovation by evaluating impact

Evaluation plays a central role in assisting decision making and innovation uptake: considering the following tools to assess impact in a variety of areas

Participants: *Impact stories*
External stakeholders: *Satisfaction survey*
Practical project impact:

- *Economic evaluation tools*
- *Scientometrics*
- *Altmerics*
- *Monitoring tool for (external) impacts*

Mapping your stakeholders

- ***Go to the Jamboard and find your pilot site***
- ***Start by brainstorming which actors you'll have to interact while working in your pilot site***
  - ***To make it happen***
  - ***Share information***
  - ***Ensure impact***
  - ***Any others!***

Information needs

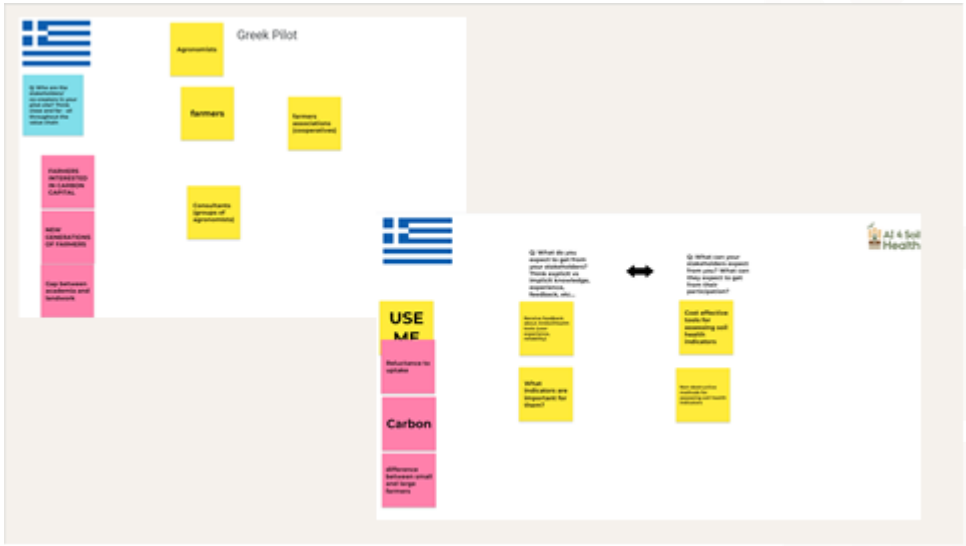
Use your group list and think (and post!) about

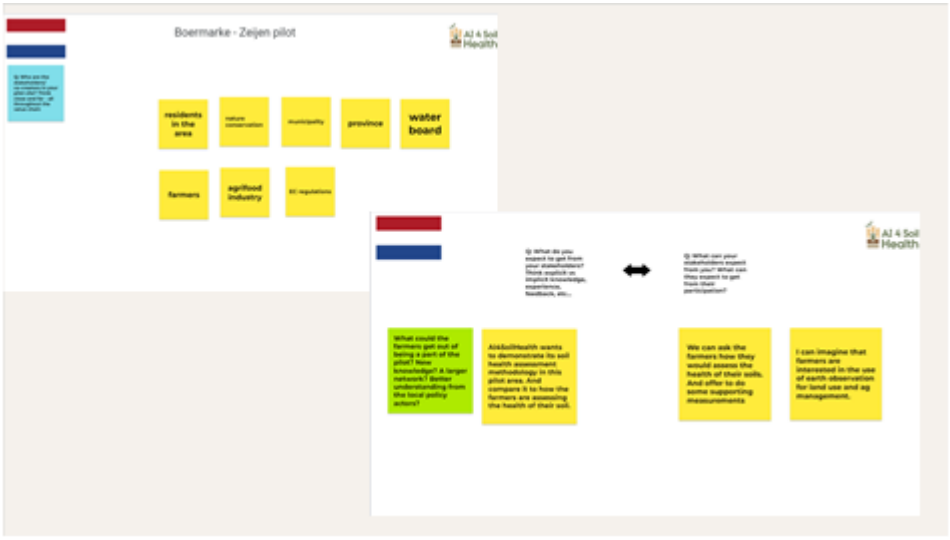
- ***What information do you want to get from your stakeholders?***
- ***What for?***
- ***How will you use it?***

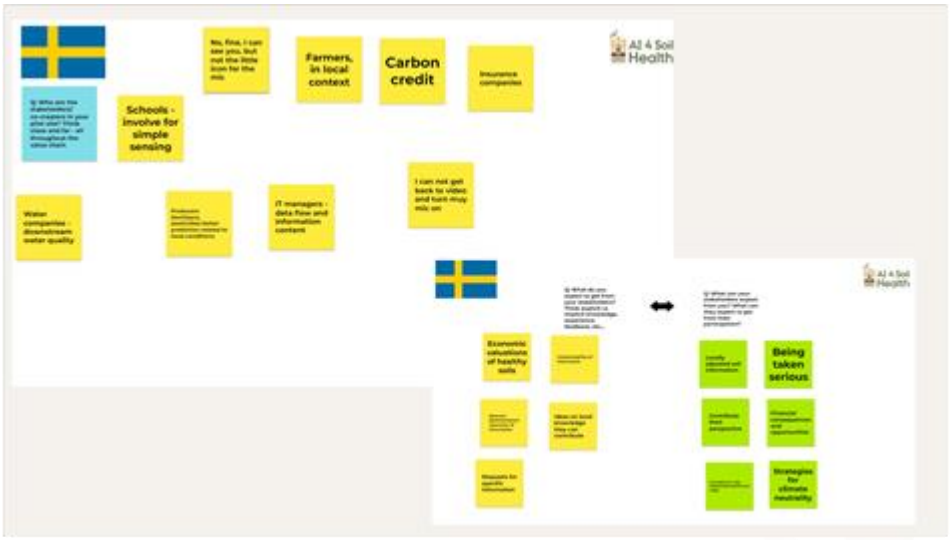
Incentivizing participation

Use your group list and think (and post!) about how the questions above relate to them

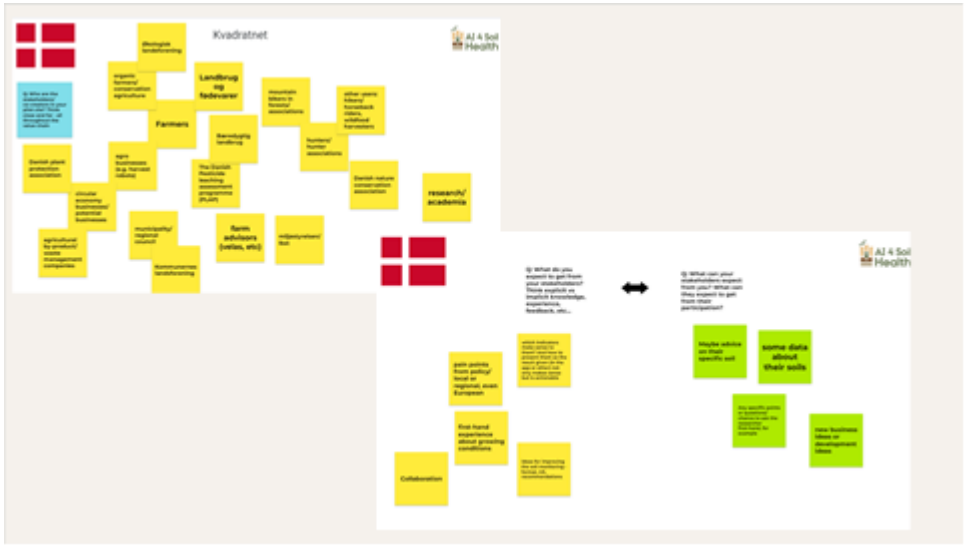
- *What information are you bringing to your stakeholders*
- *Other resources are you bringing to your stakeholders*



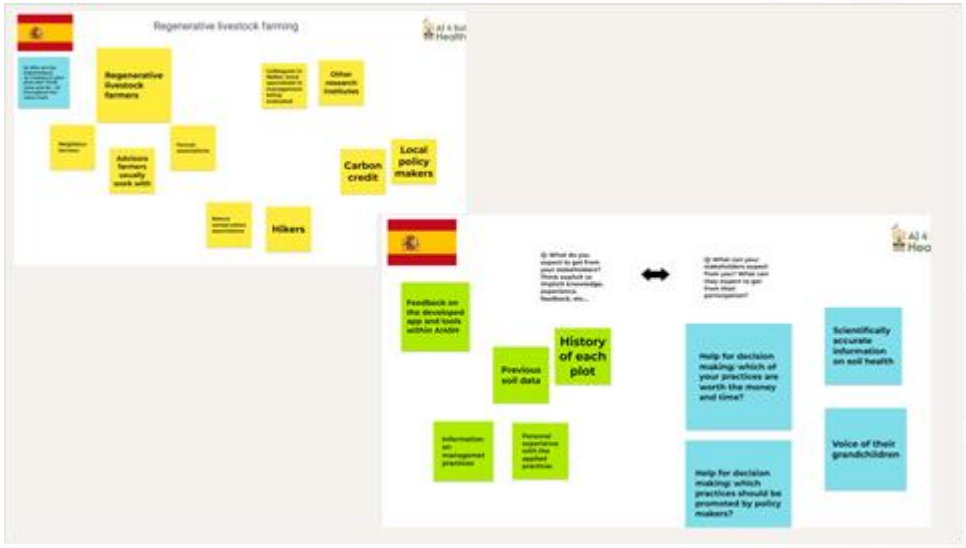

Boermarke - Zeijen pilot
residents in the area
province
water board
farmers
agrifood industry
What could the farmers get out of being a part of the pilot? New knowledge? A larger network? Better understanding from the local policy actors?
AI4SoilHealth wants to demonstrate its soil health assessment methodology in this pilot area. And compare it to how the farmers are assessing the health of their soil.
We can ask the farmers how they would assess the health of their soils. And offer to do some supporting measurements.
I can imagine that farmers are interested in the use of earth observation for land use and ag management.


Schools - involve for simple sensing
Farmers, in local context
Carbon credit
Insurance companies
Water companies - downstream water quality
IT managers - data flow and information content
I can not get back to video and turn mic on
Being taken serious
Strategies for climate neutrality


Farmers
Contractors working on the farm
Livestock - grazers
Hikers
Sheep
Dog walkers
National Resources Wales
Forestry workers
Weather and site condition updates
Future plans for the site
Soil health analysis and data


Kvadratnet
Landbrug og fødevarer
Farmers
research/ academia
farm advisors (valley, etc)
some data about their soils
Collaboration


NAME OF THE PILOT SITE
Advisory services
Policy makers
Food industry
Farmers
Crop breeders
Residents
Incentive / (positive) pressure
Legislation
Information
Resilience
Profitability
Improving legislation


Regenerative livestock farming
Regenerative livestock farmers
Other research institutes
Carbon credit
Local policy makers
Hikers
Feedback on the developed app and tools within AI4SH
Previous soil data
History of each plot
Help for decision making: which of your practices are worth the money and time?
Scientifically accurate information on soil health
Voice of their grandchildren
Help for decision making: which practices should be promoted by policy makers?


RECAP
•Upcoming milestones/deliverables and the overall pilot site process
•Outcomes and resources from this session: follow up email
•Where they can find further information
•Joint workshop with BENCHMARKS in Fall


AI
DATA CUBE
Let us know what you think!!!
5894 0612