



NBSOIL

Nature-Based Solutions
for Soil Management

Report from the first co-creation workshop

Milestone 1

31.05.2023



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Summary

The milestone has three main parts plus an annex with further information: 1) Workshop creation process and delivery, 2) Main takeaways/lessons learnt to support MOOC and advance modules development and 3) Deviations or delays.

NBSOIL (Nature Based Solutions for Soil Management) is a four-year project coordinated by the Institute of Soil Science and Plant Cultivation IUNG-PIB (PL) **that aims to co-create and test a learning pathway for existing and aspiring soil advisors**. The co-creation process will involve approximately one thousand stakeholders such as land managers, researchers, soil advisors, community organisers, entrepreneurs, technology developers, local authorities, and policy makers. Thus, approximately 300 participants from 8 countries (Poland, Austria, Switzerland, UK, France, Netherlands, Italy, and Spain) will complete the 2 years of training delivered in 6 languages (English, Polish, German, Dutch, French, Italian and Spanish), consisting of an introductory MOOC, 4 advanced modules combining online and field sessions, practical exercises, and a final project to be carried out in small groups.

NBSOIL adopts a multi-stakeholder approach and addresses the cross-cutting priorities of social innovation and engagement through an open and interactive innovation process for the creation and transfer of knowledge. This approach is integrated throughout the project, relying on stakeholder engagement and co-creation of knowledge in bottom-up processes, integrating scientific and tacit knowledge, making all knowledge accessible and relevant to actors involved in soil-related management, value chains and policy making.



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1. Introduction

Over 60 - 70% of EU soils are estimated to be unhealthy, threatening ecosystem services essential to the interrelated challenges of climate change mitigation and adaptation, halting and reverting biodiversity loss, sustainable management of the water and nutrient cycles, preventing disasters such as floods, droughts, and forest fires, and providing timber, fibre, and food for healthy diets and adequate living environments for the population. The Farm to Fork and EU 2030 Biodiversity strategies have set ambitious targets for pesticide (-50%) and fertiliser (-25%) reduction as well as increase in soil organic carbon (SOC, 0.1-0.4 % annual increase), but how the transition from the current situation will be achieved remains unclear, notably how those targets will be supported by the Common Agricultural Policy (CAP). The invasion of Ukraine by the Russian Federation and the resulting sanctions will further increase fertiliser and food prices, and there is a risk to draw back on environmental goals, and miss the opportunity to navigate the current crisis while building resilience by accelerating transitioning to low-input, climate adapted soil management systems.

In this context the 2030 Farm to Fork and EU Biodiversity targets are more relevant than ever, and interdependent on the Soil Mission goal of achieving 75% healthy or improving soils by 2030. They should be aligned with the CAP, the EU and national post pandemic recovery funds, and the measures taken to mitigate the crisis caused by the invasion of Ukraine. This is achievable, as shown by the Ten Years for Agroecology (TYFA) modelling exercise (Poux and Aubert, 2018) which considers that EU agriculture could give up synthetic inputs and still provide a healthy diet for all Europeans in spite of a decrease in production by 30%. To catalyse the transition towards sustainable soil management, the Soil Mission relies on increased cooperation and co-creation of solutions among researchers, land managers, soil advisors, the business sector, local authorities, and policymakers. This Open Innovation approach, including the deployment of one hundred Soil health Living Labs has enormous potential to trigger transformative change, but it has a series of challenges due to its complexity and strong social component. The knowledge and practice needed to manage the complexity of the Soil Health Living Labs is now often fragmented, due to the need for specialisation and local context among soil advisors.



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1.1 Objectives of the NBSOIL Project

NBSOIL 's overall objective is to gather and complement existing resources and design an attractive blended learning programme, together with matchmaking tools and advice on employment opportunities and business models, in order to enable soil advisors to implement a holistic vision of soil health through NBS and collaborate effectively across different scales. The main ones are described below:

1. Identify and recommend multifunctional Nature Based Solutions for soil health. According to the FAO, to achieve healthy soil, we need to focus on the ten main threats to soil functions: soil erosion, soil organic carbon loss, nutrient imbalance, soil acidification, soil contamination, waterlogging, soil compaction, soil sealing, salinization, and loss of soil biodiversity. Nature Based Solutions (NBS) offer a promising approach to adequately address these threats and their underlying causes by simultaneously providing environmental, social, and economic benefits. NBSOIL will focus on six multifunctional NBS categories to develop a holistic approach to land management and soil health fully in line with the IUCN Global Standard for NBS: organic fertilisers from locally available biowastes, cover crops, paludiculture, forest diversification, bioremediation, and blue - green infrastructure in urban and periurban areas.

2. Facilitate and participate in Open Innovation spaces, notably the Soil Mission Soil Health Living Labs, with the aim to co-create solutions to implement soil related NBS through field trials led by farmer and other land managers, complemented with participatory workshops involving researchers, businesses actors, local authorities, and policy makers. This will address the need to integrate science based and farmer-based knowledge (Lacoste et al 2022) by upscaling in Europe the methodology of the Innovative Farmers program and network, a partnership coordinated by SA, combined with the Living Labs methodology according to the European Network of Living Labs guidelines. NBSOIL will also collaborate with the European R&I partnership on agroecology living labs and research infrastructures and with ongoing Living Labs dealing with agroecology and NBS (AGROMIX, proGReg). This upscaling of user centered innovation will open the way for innovative services such as the role of Soil Health Living Lab facilitator together with a methodology and guidelines, as well as guidelines to mainstream NBS in soil related value chains, decision making and policy.

3. Make use of digital tools for learning and collaboration and low cost, accurate soil sampling and testing, together with user friendly digital tools for soil monitoring, modelling, and mapping.

This will allow soil advisors to tackle the increased complexity of data collection, design and management of soil care strategies based on NBS.



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This use of AI to connect, combine and make available currently fragmented human generated knowledge in in line with the European AI Strategy 15In addition, the models, algorithms, data sources, and results are accessible to non-technical users through a web browser application.

4. Integrate and make data and models available in a user friendly, public, Open Source and free, visually attractive GIS platform: In the NBSOIL GIS Platform, based on AgriSatwebGIS platform, farmers, technician and, in general, the final users will visualise and consult the generated data and maps. Models and products from ARIES will be integrated into the platform making available to the user all the information for decision-making for crop management.

5. Finally, collaborate among soil advisors and other experts and connect with land managers through the NBSOIL marketplace platform which will be built by upgrading the Triple Performance platform (<https://wiki.tripleperformance.fr/>) which has been specifically designed to address the collaboration challenge of innovative agroecological practices, with a mix of state of the art UX, good SEO and as much social/interactive features as possible to help practitioners and advisors spread themselves the right knowledge to their peers. It will provide a shopfront and access point to specialised national platforms such as AGROasesor (<https://agroasesor.es/es/>) which integrates the cultivation operations in the plot, with the advice of crops, through decision-support tools. Each user manages the data of their actions on the plot: They can keep the administrative notebooks of phytosanitary and fertilisers updated, with the support of updated SIGPAC information each campaign, they can access digital information from soil maps or satellite images, which are incorporated into the track your crops Regarding bioremediation and urban soil management which require specific type pf expertise, the interaction will be ensured between advise providers and environmental consultants, remediation service providers, spatial planning offices, industries, authorities, problem owners (those who are responsible for remediation of contaminated land) to tailor the advisory process to specific needs of land management in urban or post-industrial areas

This overall objective will be achieved through the following specific objectives:

SO1. Enhance the capacity of soil advisors to recommend NBS for soil health and its interrelated challenges .

SO2. Build bridges between soil advisors, innovative land managers and community organisers to create Soil Care Lighthouses and train Soil Health Living Labs facilitators.



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SO3. Contribute to a harmonised monitoring, reporting and verification methodology with sampling and data evaluation protocols to be developed within the Soil Mission.

SO4. Leverage the use of appropriate technology for digital tools and citizen science approaches for data collection.

SO5. Identify innovative business models and foster employment opportunities for soil advisors.

SO6. Inform advisors on the different policies and regulations affecting soil health and the use of NBS.

SO7. Inform policy makers on the need to integrate soil health in spatial planning and recommend evolution of regulations and policies to attain Soil Mission, Farm to Fork, EU Biodiversity Strategy objectives.

SO8. Increase soil literacy, reach out and maximise impact beyond project's end.

1.2 Objectives of WP3

NBSOIL is structured in 7 Work Packages. WP1 will systematise all knowledge by the project. WP2 research in depth 6 NBS categories and provides the location for field testing and training of soil advisors **in WP3** which will be supported by WP1,2,4, 5 to develop and prototype blended, participative training, from an introductory MOOC to group final projects. WP4 will inform WP3 on appropriate technologies for soil and vegetation monitoring from the sky to the ground, and WP5 will analyse existing business models and policy frameworks in relation with Soil Health and propose their evolution in support of the Soil Health Mission objectives. WP6 will maximise impact through communication and dissemination activities, and an exploitation strategy resulting in a collaborative platform for soil advisors and land managers. Finally, WP7 will take care of the project management, including gender and ethics aspects.

The WP3 will develop a comprehensive **training programme for next generation soil advisors and advisory services**. It will engage with advisory services across the EU and associated countries to strengthen the knowledge and skills base to provide impartial advice on soils and sustainable management incorporating evidence and insights from WP2 and WP4. Through the establishment of pilots, a curriculum of training resources to raise soil literacy will be co-designed, developed, trialled, and validated. This WP will collaborate with the project funded under the topic HORIZON-MISS-2021-SOIL-02-07: National engagement sessions and support to the establishment of soil health living labs in order to align training with the deployment of the Soil Health Living Labs. The aim will be to empower 300 participants to complete the training programme and create a network of next generation soil advisors to



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support the implementation of the Soil Health Mission utilising their improved knowledge and understanding of Digital Advisory Tools and Services (DATS) to a wide range of land managers, relying on the NBS gathered and researched in WP1 and WP2.

1.3 Why the MOOC

The Brussels Soil Mission event made us even more aware of the fact that we are the only Soil Mission project that focuses on soil advice and soil advisors, which is quite a responsibility.

So, a MOOC on soil advice will be developed where it will reach a wider audience than just soil advisors, as soil advice directly and indirectly influences many other people and organisations.

The MOOC is an option to be able to address all people and organisations currently giving and receiving soil advice. It is an easy and effortless way to learn and to identify audiences who do not normally require soil advice but who could benefit from it.

Such a MOOC should aim to

1. Raise awareness of the importance of soil advice, the challenges in existing and emerging sectors, and the differences between countries and regions.
2. Explain why soil advisors and soil advisory processes are a key figure for the success of the Soil Mission, and what challenges they face in the different sectors.
3. Engage potential participants in the advanced modules and the Soil Mission.



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2. Workshop creation process and delivery

2.1 Objectives of the workshop

The main objective of the workshop was to create an immersive, interactive and flexible learning experience on soil health and to make participants aware of the importance of soil health, to raise awareness of the importance of soil advice, the challenges in existing and emerging sectors and the differences between countries and regions, to explain why soil advisors and soil advisory processes are a key figure for the success of the Soil Mission, and what challenges they face in the different sectors and engage potential participants in the advanced modules and in the Soil Mission.

So, in this sense the organizers tried to several groups of stakeholders including agricultural advisors, farmers, researchers, knowledge-sharing experts, policy makers and other stakeholders interested in the characteristics of soil health, how to ensure it and how to maintain it.

2.2 Structure of the workshop

The workshop was designed and developed with the following structure:

1. Introductions: brief introduction of each stakeholder: name, position, interest in the topic
2. Icebreaker exercise
3. Short project introduction, and how it aligns with the soil mission proposed by the European Unions,
4. A SWOT analysis exercise, so participants can be able to highlight what they believe the strengths, weaknesses, opportunities, and threats for the development of a soil health online course with a focus on soil health advisors are.
5. Concise explanation of what the objectives of the MOOC are.
6. Informal small group conversations on the relevant and challenges of soil advise and soil work nowadays.
7. Finally, the attendees were able to discuss their opinions and next steps were shared.



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3. Development and results of the workshop.

On 11th and 18th May 2023, the NBSOIL team held the first online co-creation workshop. Reaching out to both internal and external stakeholders, the workshop presented NBSOIL and the goals of the project; and ran activities aiming to better understand the audience with a goal to develop the Massive Online Open Course (MOOC), advanced modules and tools that are well targeted and suited to the needs of soil advisors across the EU. In addition, it was a great opportunity to learn what stakeholders from across Europe are doing and thinking to support improvements in soil health; and to share knowledge with colleagues and access practical information on this topic, being at the forefront of this process and making sure their voice is heard. The objective of this MOOC is to be able to train three hundred participants and create a network of next generation soil advisors to support the implementation of the Soil Health Mission.

Across these 2 events the organizers had the chance to engage around 35 participants from across Europe, and from a variety of backgrounds : researchers, advisors, foresters, farmers, green finance, knowledge exchange...Some of the ways our participants have worked on improving soil health working directly on the land as a farmer, others by supporting farmers, participating in EU soil-focused projects, as well as direct advise provision.

3.1 Soil health perspective

First of all, we wanted to know what each attendee's feeling and perspective on the importance of soil is. In order to find out their initial knowledge about soil health, participants were asked a number of questions to which they were asked to respond according to their own criteria. Participants provided information on the relevance and changes they currently perceive around soil health and its importance in different sectors and geographical areas. Some of the most popular phrases where soil is crucial to ensure a regenerative future, and of course, all participants debated on this statement. We all connected on the statement that soil was the future of ecosystems, biodiversity and human health and the need to take care of it.

Once we all agreed on the same direction, we started to explain in more detail what the Soil Mission proposed to alleviate this situation on soil health in Europe. Thus, we indicated that such threats to soil are characterised by a negative trend in one or more soil properties (e.g., soil organic carbon), (e.g.



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loss of organic carbon (SOC) in crops, inputs of industrial pollutants, water holding capacity), or are directly indicated by observed soil characteristics (erosion, sealing, etc.).

In addition, we wanted to know the opinion as to whether, beyond agriculture, soil health could affect any other sector. Some of the participants commented that they thought that the sector most affected by this problem is the rural sector, but our objective was to emphasise that industrial, urban, forestry and rural sectors are equally affected by this soil problem.

In this section, we ended by explaining the soil mission and what it consisted of. The Mission leads the transition to healthy soils by funding an ambitious research and innovation programme with a strong social science component launching an effective network of 100 living labs and beacons to co-create knowledge, test solutions and demonstrate their value in real-life conditions developing a harmonised framework for soil monitoring in Europe raising public awareness of the vital importance of soils. Its eight objectives are:

1. Reducing desertification.
2. Conserve soil organic carbon stocks.
3. Stop soil sealing and increase reuse of urban soils.
4. Reduce soil contamination and improve soil restoration.
5. Prevent erosion.
6. Improve soil structure to increase soil biodiversity.
7. Reducing the EU's overall soil footprint.
8. Improving soil literacy in society.

In addition to indicating which European projects, we were participating in this Mission.

3.2 SWOT exercise

The SWOT analysis matrix is a well-known strategic tool for analysing situations. The main objective of applying the SWOT matrix is to provide a clear diagnosis in order to be able to make the appropriate strategic decisions and improve in the future. For this reason, we wanted to conduct this analysis exercise with all the participants **on soil counselling in Europe and on the development of the MOOC.**

The external analysis of the company identifies:



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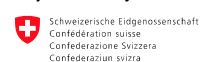
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- Opportunities: they represent a possibility for improvement in the advice of soils and the development of the MOOC. Opportunities are positive factors that the company can take advantage of in this situation.
- Threats: They can threaten the survival of these ideas. However, if a threat is identified in time, it can be avoided or turned into an opportunity.

In the internal analysis, a self-assessment has to be conducted, which tries to identify the strengths and weaknesses of both ideas.

- Strengths: These are all the capacities and resources that both ideas have to take advantage of opportunities and build competitive advantages.
- Weaknesses: These are those points that the company lacks, in which it is inferior to the competition or simply those in which it can improve.



Example aspects that were indicated in this activity were:

Strengths:

- Much of the knowledge needed to regenerate soils are already scientifically proven and published.



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- Actionable knowledge - transferable and replicable if done right.
- Existing literature.
- Existing pioneer farmers
- Growing research evidence and new benchmarks for soil health published this week:
<https://www.ceh.ac.uk/news-and-media/news/first-ever-soil-health-benchmarks-all-lands>.
- It allows us to improve soil health.
- It can help improve soil health or at least make sure it does not get worse.
- It is starting to be a trendy topic! The fact, that we speak so much about carbon in the media may be an opportunity to highlight the role of healthy soils.

Weaknesses

- Capacity issues - skills shortages and knowledge gaps
- Difficult to translate soil science into actionable practice in-situ / in-field e.g., soil microbiology.
- Farmers listen to farmers. Outsiders have difficult to gain their trust.
- Farming and environmental management are the top two least diverse professions, at least in UK - lack of representation.
- Field specific tailor-made advice is necessary but complicated.
- Harmonisation across methodologies for measuring soil health indicators is needed across territories.
- If the soil advice focuses on just one or a few points, the advice can make the overall soil worse.
- An integral point of view is needed but requires much knowledge soil advising can be very ideological/dogmatic speak about soils without start from the needs of farmers.
- There is not much information on this and is too technical.

Opportunities

- Growing market for carbon credits generated by carbon farming.
- Local climatic constraints that force to take care about soils.
- New legislation / policy mechanisms providing funding to improve soil health e.g., Environmental Land Management in UK.
- Need for many professionals to know more about soil health to support habitat creation and enhancement as a mandatory component in UK planning from Nov.



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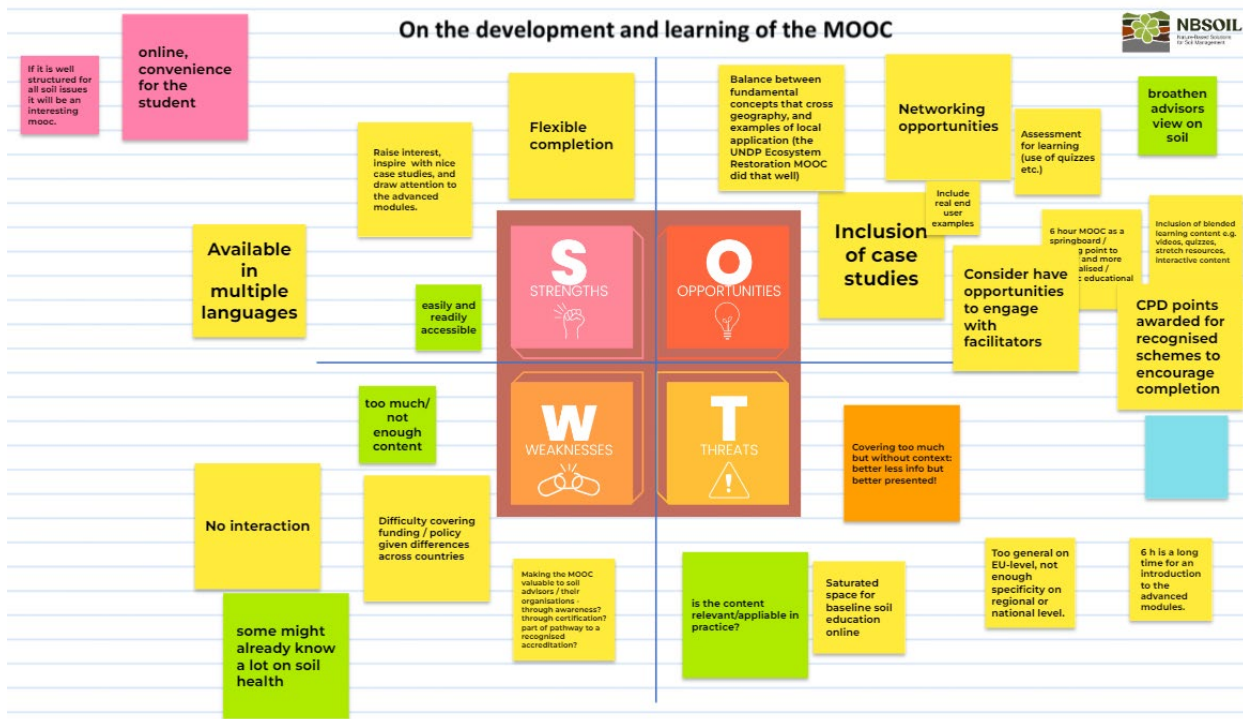
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- New types of more accessible training.
- New people involved in environmental activities.
- Growing number of soil science and soil educational courses emerging upcoming soil health law will bring even more focus on the topic huge interest for the subject of soil health at the moment.

Threats

- Competing ideas around what good advice is.
- Cost of taking large scale soil baseline / measurements for land owners at scale.
- Making soils worse with advice on just one or a few soil parameters.
- Non-deliverable of expected results due to unforeseen natural events or climate events
- Not enough funding.
- Rapid divergence in policy of devolved UK nations e.g., different approaches in England, Scotland, Wales make training limited pool of advisors even more challenging.
- Too dogmatic/ judgmental - refuse from land users.



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3.3 Need of a MOOC

Once that activity was over, we started to focus on the MOOC, what it is, who could be potential users and what its structure and form could be.

Online tools make it possible to reach advisors and participants from across the continent; this includes more accessible ways to get training. There are many successful online courses emerging, many of them with a focus on soil science and soil education: this means excellent examples for developing a strong resource. What threats and weaknesses are there to the development of our courses?

Although there are many opportunities and increasing trust-worthy resources, the team needs to be aware of the key challenges presented; by recognizing them we can improve the chances of the MOOC and advanced modules being impactful and interesting enough to be taken up by stakeholders.

Some are associated to the concept of soil health and how it is being implemented (from a clear concept to shared policies across the continent), others to the structural business conditions delaying change and others to agricultural knowledge transfer challenges:

- Concepts and know how.
- We need a clear concept on soil health and what it means: that is still missing!
- There is increasing know how and methods to address soil health. This has positives, but also negatives such as:
 - Soil is increasingly important, but there still a need to increase their relevance across agricultural curriculums (Switzerland mentioned this).
 - Difficulties translating soil science into actionable practice in-situ / in-field e.g., soil microbiology.
 - Need for harmonisation across methodologies for measuring soil health indicators is needed across territories.

Advisors:

- Being a new field, advisor capability / skills shortages and knowledge gaps are hard to assess properly and address: how to ensure the quality and knowledgeability of the experts?
- The notion of “advisor” is equivocal: There is no one “soil advisor,” but a variety of experts in areas that affect soil health. By acknowledging it, we can ensure we do not



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narrow the concept, but rather bring different people, with different motivations and knowledge to the table (for example, is a supplier a soil advisor?).

- There are also different levels of expertise to consider, and we should think about how we address that.
- How can the project ensure a soil advisor is qualified after going through the programme?
- Soil advising can be very ideological/dogmatic and it often ignores farmer's needs: we need a user-centric approach that embraces complexity.

Farmers are interested in the topic, but are also facing many challenges and do not necessarily know who to trust:

- How can we make this topic relevant to them and increase farmer awareness about all these changes?
- Farmers listen to farmers. How can we embrace farmers to come into this sphere and develop strategies aimed at gaining their trust?

Field specific and tailor-made advice, even farm field to farm field is necessary but difficult to provide.

If soil advice focuses on just one or a few points rather than recognizing the diversity that is needed to address a complex ecosystem such as soil, the advice can result in worsening of soil health. An integral point of view is needed, but this requires different perspectives and a lot of knowledge!

Information access is uneven, and some areas have limited resources to get it.

Legislation is coming together, but there are still differences across countries and policies.

The reliance on synthetic inputs/conventional practices can be at odds with soil health /advisors need to address this challenge.

Farming and environmental management are two of the least diverse professions, at least in UK - lack of representation.



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3.4 What should we consider when developing the MOOC ?

3.4.1 Complexity

A key aspect highlighted but participants was the need to be able to share knowledge without reducing complexity: geographical specificities, the uniqueness of soils, and the diversity of ecosystem services result in the need for advisors to manage many areas of knowledge. This does not necessarily all soil advisors should be experts in everything, but rather that they should be aware of their own knowledge and what they are missing; and know how to source those missing pieces.

The MOOC would benefit from highlighting experts engaging in a collaborative process where a farmers/advisors/stakeholders share their perspectives and a wide array of ways of doing things; and by working together and sharing knowledge and practice they add up to more than the sum of their parts.

It also essential to open conversations around the complexity of the topic and start putting together the complex puzzle that is soil health, highlighting that there is no one practice/methodology that can secure soil health as a whole and that this complex issue requires a wide array of knowledge and management. In doing so, we can also open a space for diversity in this environment.

3.4.2 Lived experience/real life cases.

Well selected case studies make knowledge accessible and easier to implement and they are key to bringing knowledge and opportunities to life; and therefore, model what is possible and support uptake. First-hand experiences/examples of what has been tried, what has worked and what has not worked is critical for practice change on the ground. It However, it is currently difficult to find examples on what works and what fails in current available programs.

In some participants opinions, the best MOOCs they have participated on are the ones where these cases are interspersed as case studies with application, bridging that link between theory and application.

This means bringing cases from different actors' perspectives -farmers and advisors-, specific areas of knowledge and types of knowledge -academic, practical, advisory- and different goals -what are they aiming to achieve: biodiversity gains? productivity? □ this will allow us to highlight key words and concepts that sometimes get lost because they are not being mentioned in official policy.



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The topic carries a complexity / place specificity that has to always be in the background!

3.4.3 Advisors

There is a need to acknowledge different kinds of advisors, not only in their areas of expertise, but in their motivations and associated level of knowledge required.

There are different “levels” of soil advisors, and AERES suggested they can be categorized three categories:

- Experts with a “research hat”, wide knowledge on the wider topic and specific fields of greater expertise; experts in one aspect (like suppliers) who need to be aware that there are more levels, broaden their perspectives; and coaches, usually farmers who don’t want or need to be mega experts, but need to know enough to support their mentees.
- In many countries most advisors are suppliers, so they often have something to sell; their motivations could interfere with providing the right advice, but if their motivations are acknowledged we can work on a level field and increase trust. Also, given their importance, it is important to take these advisors on board and support their development.
- Other advisors are practitioners/farmers themselves who can be formal or informal advisors. Trust levels for them are high, as farmers listen to farmers and those on the ground can showcase the benefits and/or challenges of specific tools and practices. Therefore, it would be great to have testimonials of farmers, before and after visual experiments or metrics on the lab. In some cases, they have been recognized as “soil coaches” farmers -Netherlands- and they teach their colleagues; through this they have been raising more attention to sustainable soil practices.

There are new groups of advisors coming from other areas, for example, ecologists who are eager to know more about soils and know who to go to when they need support from soil advice services. Often their goals are on supporting broader ecosystem services and who are thinking about different soils and how they shape habitats and services. These new consultancy teams are interested in providing farmers and land managers with the tools to manage soils to attract payments, but also the requirements that 10% biodiversity net gain in the UK. Other areas to consider are in the construction sector, risk about soil ceiling construction, so many opportunities for those there and that could also be helping with habitat creation.



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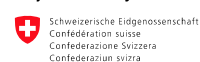
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You need all these categories to make systemic change, as they all address various levels and different practices that reach practitioners. For the MOOC, do we want to cover them all, or some?

3.5 What should the MOOC include ?

One of the key questions to answer is what the target group is, and how to target. While that needs to be resolved, here are some more general aspects to consider: Core content for everyone: the way we manage soils and what we know has changed massively in the past decade. More traditional advisors have not necessarily kept up to date with current understanding, for example, carbon stabilization or how microbial and soil compounds operate, and that is critical to farming management for example. Core principles and current knowledge would be critical for the MOOC and/or additional levels.

Something to certify knowledge: someone providing advice should be able to provide some evidence of competency. There are some competency frameworks (BSSS) we could explore.

Practice/case studies in specific geographical areas and solutions/alternatives and why they work, not only to inspire the areas but to inspire others.

Some areas are struggling unsupported systems, chances to catch up with Europe is great through these projects.

In Serbia, for example, there is a huge organic matter loss and lack of cattle, it is very hard to find the tools at the moment to improve or mechanisms to give people the methodology to start addressing some of these challenges.

Tools:

- Field level indicators: how a farmer can know if their soil is in good conditions + evidence from the field.
- Something physical that could be used, like field guides! Indicators of colour, a small book you can take into the field.

Not only success, but also challenges and fails how to speak to communities and how you understand why they are not applying what is there, what are the barriers to apply what is already there. Bring pragmatic knowledge to the farmer, what are farmer-based solutions, farm practices, impact on soil. Interaction: online programs often lack a link to real people. Could we have a board of recognized advisors that could be listed to be reached? Spaces to reach out to understand more about specific topics.



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Collaboration strategies, connections, and prompts: how to get soil advisors to collaborate / landscape processes and economies of scale. Cross disciplinary collaboration can be really important to ensure they know which other advisors with whom they should connect.

Policy knowledge: to inspire actions across geographies.

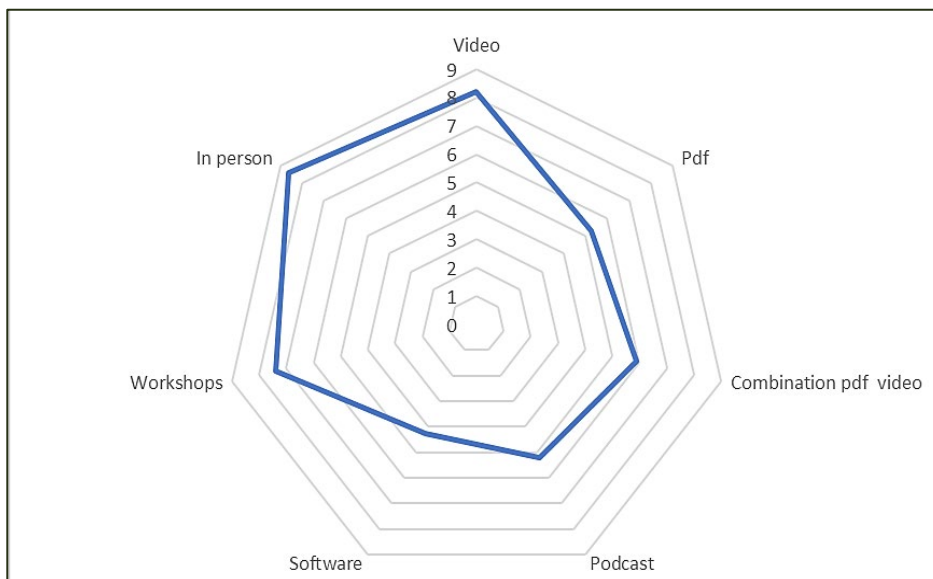
What to do with polluted soils

3.5.1 Learning Tools, what Works ?

According to the results of the survey developed prior to the kick-off meeting of the project and the responses of the participants of this workshop, the vast majority declined to establish a learning environment based on video recordings, face-to-face classes, and workshops together.

These aspects will be taken into account for the establishment of each of these learning media. Our aim is to meet the learning needs of future soil advisors.

Below is an image taken on 18 May after the vote of the attendees:



The answers obtained in the survey will also serve as support for the content explained in this workshop. With a total of fourteen responses, the percentages are as follows:



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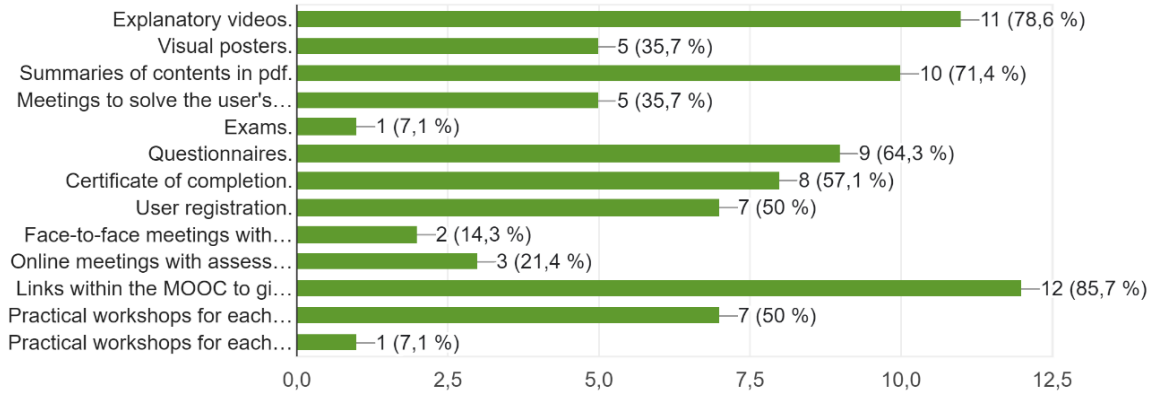
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Check the fundamental structures that the MOOC should have

14 respuestas



The priorities are as follows:

1. Links within the MOOC to give more information to the user.
2. Explanatory videos.
3. Summaries of contents in pdf.
4. Questionnaires.
5. Certificate of completion.
6. User registration
7. Practical workshops for each of the advanced modules



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4. Conclusions and next steps

Soil is the foundation of our food systems. It provides clean water and habitats for biodiversity while contributing to climate resilience. It supports our cultural heritage and landscapes and underpins our economy and prosperity. However, it is estimated that 60-70% of soils in the EU are unhealthy. Soil is a fragile resource that must be carefully managed and safeguarded for future generations. One centimetre of soil can take hundreds of years to form but can be lost in a single storm or industrial incident.

Therefore, knowledge and practice of soil improvement techniques is essential.

It was concluded with all participants that it was necessary for all actors (universities, research institutions and a wide range of stakeholders, as well as individuals) to manifest in this Mission Soil and become part of a community that cares about this fundamental issue.

We recommend the reader to sign the Mission Soil manifesto, to form a vibrant community of vibrant community of soil advocates of soil advocates. You will gain first-hand access to knowledge about soil health and the Soil Mission and be able to meet and learn from others. Signatories will be more easily connected and will be able to receive and exchange information through various channels. This will include a Mission newsletter providing information on Mission progress, projects and their results, Mission calls for proposals, events, and policy development. In addition, you will have access to the latest information on each of the Mission's projects such as the current NBSOIL project.

It was interesting the analysis of the SWOT matrix to know each of the thoughts of the participants about land consultancy in Europe. Giving us an insight into their concerns about covering a large area for the training of these advisors, although they see immense potential for this figure to be created and are committed to the tools and indicators that we will propose in each of the advanced modules. With regard to the nature-based solutions, they believe that there should be accessible and nearby demonstration sites for learning each of these techniques in order to be able to provide adequate advice to farmers. Specific and tailor-made advice, even on a field-by-field basis, is necessary but difficult to provide. If soil advice focuses on one or a few points instead of recognising the diversity needed to deal with a complex ecosystem such as soil, the advice can lead to a worsening of soil health. A holistic view is needed, but this requires different perspectives and a lot of knowledge.



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Access to information is uneven, and some areas have limited resources to obtain it. Although legislation is becoming more unified, differences between countries and policies remain. Reliance on synthetic inputs and conventional practices can be at odds with soil health.

The MOOC would benefit from engaging experts in a collaborative process where farmers/advisors/stakeholders share their perspectives and a wide range of ways of doing things; and by working together and sharing knowledge and practices, they add up to more than the sum of their parts. It is essential to open up conversations around the complexity of the issue and begin to piece together the complex puzzle that is soil health, highlighting that no single practice/methodology can guarantee soil health as a whole and that this complex issue requires a wide range of expertise and management. Tools such as field indicators, field guides, colour indicators, digital tools will be needed to support such assessment.

Next steps

We need a clear concept of soil health and what it means - it is still lacking!

As this is a new field, it is difficult to accurately assess and address the shortage of skills and knowledge of advisors. It is also necessary to consider the distinct levels of expertise and to think about how to address them. Soil advice can be very ideological/dogmatic and often ignores the needs of farmers: we need a user-centred approach that embraces complexity.

Farmers are interested in the subject, but they also face many challenges and do not necessarily know who to trust.

We will continue to define each of the learning lines in order to solve all the doubts that the participants of this first NBSOIL workshop have had and have requested.

For more information on what was discussed and evaluated at the workshop, please find attached the link to the presentation, which is freely accessible:

<https://www.mentimeter.com/app/presentation/alkw6diz7buxghjefi8c5b18de3dy1k4>



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5. Deviations or delays

No delays for this milestone delivery. The workshops were delivered on the 11th and 18th May 2023, and the report was presented by 26th May, in alignment with the required dates. Constant conversations with other milestone actors, such as the REVOLVE team, have been in place to secure the delivery of the milestone.



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