Ref. Ares(2024)8860584 - 11/12/2024

NBSOIL
Nature-Based Solutions for Soil Management

Soil advice supply, demand, challenges and opportunities – interactive map

Deliverable D3.1

31.05.2024

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs
Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Deliverable 3.1	Soil advice supply, demand, challenges and opportunities – interactive map
Related Work Package	WP3 – Communication, dissemination and exploitation
Deliverable lead	REVOLVE
Author(s)	Olivier Ejderyan (FiBL) Mahsa Bazrafshan (FiBL)
Contact	olivier.ejderyan@fibl.org
Reviewer	Grzegorz Siebielec (IUNG)
Grant Agreement Number	101091246
Instrument	Horizon Europe Framework Programme HORIZON-MISS-2021-SOIL-02
Start date	01 December 2022
Duration	48. months
Type of Delivery (R, DEM, DEC, Other)[1]	R
Dissemination Level (PU, CO, CI)[2]	PU
Date last update	05.12.2025
Website	nbsoil.eu

Revision no.	Date	Description	Author(s)
0.1	31.05.2024	First version	Olivier Ejderyan (FiBL)
0.2	10.11.2024	Revised version	Olivier Ejderyan (FiBL) Mahsa Bazrafshan (FiBL)
0.2	05.12.2024	Revised version	Olivier Ejderyan (FiBL) Mahsa Bazrafshan (FiBL)

Please cite this deliverable as:

Ejderyan, O. D3.1 Soil advice supply, demand, challenges and opportunities – interactive map Initial Version. NBSOIL project funded under grant agreement n. 101091246 *of the European's Union Horizon Europe programme. May 2024. Document available at: nbsoil.eu*

[1] **R**=Document, report; **DEM**=Demonstrator, pilot, prototype; **DEC**=website, patent fillings, videos, etc.; **OTHER**=other

[2] **PU**=Public, **CO**=Confidential, only for members of the consortium (including the Commission Services), **CI**=Classified

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Disclaimer

The opinions expressed in this document are that of the authors' and in no way reflect the opinion of the European Union or the European Research Executive Agency (REA). The European Commission is not responsible for any use that may be made of the information this document contains nor for any errors, as these remain the responsibility of the authors. This document is produced by Task Leader FiBL and is under Creative Commons license Attribution-Non-Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0), meaning that partners can share or adapt the content herein for free as long as recognition is rightly attributed to the authors, as such: Title of figure/diagram, Source: NBSOIL. Therefore, all content may be used by partners for their communication purposes, and moreover all partners are expected to read and deploy this communication strategy together.

FiBL as document leader and main responsible may not be held responsible for the level of engagement of each partner in implementing this communication strategy. The misuse or erroneous external use of the communication materials that may emanate from this deliverable, either purposely in adapting the content or unintentional as transmitting in another language, are not the responsibility of the authors who will remain available to support all NBSOIL partners throughout the duration of this project for the implementation of this communication plan.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

1 Executive Summary

Deliverable D3.1 of Task 3.1 in the NBSOIL Horizon Europe project, offers a comprehensive analysis of soil advice supply across several European countries. It aims to identify the challenges and opportunities in the current soil advisory landscape and proposes strategies to enhance soil management practices. The document covers the Agricultural Knowledge and Innovation Systems (AKIS) in countries such as Austria, France, Italy, the Netherlands, Poland Spain, Switzerland, and the United Kingdom, focusing on both the provision of soil advice and the needs of soil advisors.

The report is structured followingly. It begins with an introduction to the core concepts related to AKIS and details the key initiatives and innovations in soil health management across different countries. Each country section provides an in-depth evaluation of soil advice supply, covering aspects such as expertise acquisition, certifications, training resources, providers, funding, challenges, and overall evaluation. The demand side assessment evaluates the needs of soil advisor based on exploratory and a quantitative survey. The report finally introduces an interactive map designed to match existing offers for soil advisors with their training and information needs and demands.

.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

2 Introduction

Deliverable D3.1 build on content of Task 3.1 of the NBSOIL project. We present a comprehensive analysis of the supply and demand for soil advice across various European countries. The goal is to identify the challenges and opportunities in the current soil advisory landscape and propose strategies for enhancing the effectiveness of soil management practices. We have structured this document by first providing insights of our review of Agricultural Knowledge and Innovation Systems (AKIS) related to soil health, focusing on both the supply side (the provision of soil advice) and the demand side (the needs of soil advisors).

We include evaluations of the soil advice supply in Austria, France, Italy, the Netherlands, Poland, Spain, Switzerland, and the United Kingdom, highlighting key initiatives, training resources, and funding mechanisms. We also address the challenges faced by soil advisors in these countries and offer recommendations for improving the accessibility and quality of training and information resources. Following this, we present an analysis of the demand for information and training resources on soil health and nature-based solutions by soil advisors in Europe, based on a quantitative survey. Finally we introduce an interactive map aimed at making the existing offer in training available to soil advisors.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

3 Core concepts related to Agricultural and Knowledge Systems (AKIS) regarding soil in the NBSOIL countries

For this analysis we considered AKIS focusing on a broad range of innovation practices that cover following categories:

- Technological Innovations: Development of new tools and equipment for soil analysis, precision farming technologies, and digital platforms for soil health monitoring.
- Process Innovations: New farming practices that enhance soil fertility, such as crop rotation, use of cover crops, reduced tillage, and organic farming methods.
- Social Innovations: Initiatives that involve community participation in soil health projects and educational programs to raise awareness about the importance of sustainable soil management.
- Organizational Innovations: Creating new models of collaboration and cooperation among stakeholders, including multi-actor networks and partnerships that focus on soil health.

3.1 Austria

Austria's Agriculture Knowledge and Innovation Systems (AKIS) focus on integrating National Rural Networks (NRNs) to enhance knowledge exchange on soil health. These NRNs facilitate connections between farmers, researchers, and advisors through thematic workshops and cross-border projects, aiming to disseminate best practices and innovative techniques in soil management.

3.1.1 Key Initiatives Using Thematic Workshops and Cross-Border Projects

Soil Health Workshops: These events concentrate on sustainable soil management practices, soil fertility, and organic farming methods. For instance, workshops have covered the benefits of crop rotation, the use of cover crops, and the implementation of reduced tillage techniques. Experts from various fields provide practical advice and research findings, which are then shared among farmers and advisors.

Digital Innovation Workshops: These workshops focus on the use of digital tools and platforms for soil monitoring and management. Technologies such as soil sensors, drones, and satellite imagery are discussed, providing farmers with the knowledge to monitor soil health in real-time and make informed decisions to optimize soil management.

Operational Groups (OGs): Supported by Austria’s NRNs, these groups tackle specific soil health issues. For example, a cross-border OG might work on developing new techniques for managing soil organic matter or controlling soil-borne diseases.

3.1.2 Promotion of innovation

Austria’s Open Innovation Strategy promotes soil health innovation by encouraging collaboration among various stakeholders, including farmers, researchers, public authorities, and private entities. This strategy focuses on several key areas:

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government’s Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Knowledge and Technology Transfer: Facilitating the exchange of scientific research and practical knowledge between universities, research institutions, and the agricultural sector. This includes the creation of digital platforms that share data and best practices in soil management, ensuring that innovative solutions reach farmers efficiently. Examples include online databases and mobile apps that provide real-time soil health data and advice on best practices.

Engagement and Collaboration: Promoting partnerships between public bodies, private companies, and civil society to co-develop and implement soil health innovations. Joint projects, public-private partnerships, and collaborative research initiatives are encouraged to address soil health challenges. Programs that involve community participation in soil health projects, such as educational programs and local soil health monitoring groups, are also promoted.

Digital Tools and Precision Agriculture: Developing and deploying digital tools that help farmers monitor soil conditions in real-time. These tools include advanced soil sensors, drones for aerial soil inspection, and satellite imagery for large-scale soil health assessment. Precision agriculture techniques, which optimize soil management practices by reducing chemical inputs and enhancing soil structure, are heavily promoted. This includes variable rate technology for precise application of fertilizers and irrigation.

Policy Support and Incentives: Creating supportive policies that encourage sustainable soil management practices and provide financial incentives for adopting innovative soil health technologies. This includes grants and subsidies for farmers who implement advanced soil health practices. Regulatory frameworks are established to encourage sustainable land use and soil conservation practices, ensuring long-term soil health.

3.2 France

France’s Agriculture Knowledge and Innovation System (AKIS) is robust, with a significant focus on enhancing soil health through integrating National Rural Networks (NRNs). These networks facilitate knowledge exchange by organizing thematic workshops, cross-border projects, and interactive events that bring together farmers, researchers, and advisors. The goal is to foster innovation and disseminate best practices in soil management.

3.2.1 Key Initiatives

Thematic Workshops: Soil Health Workshops: France organizes numerous workshops dedicated to soil health, focusing on sustainable soil management, soil fertility, and organic farming practices. These workshops, often under the umbrella of NRNs and supported by institutions like the French National Institute for Agricultural Research (INRAE), provide practical advice and insights from experts. For instance, workshops on soil conservation techniques and the use of organic amendments have been held to enhance farmers' knowledge and practices.

Digital Innovation Workshops: Workshops covering the use of digital tools and platforms for soil monitoring and management are also prevalent. These sessions aim to equip farmers with the latest technologies for soil analysis and precision farming. Digital platforms, like the French Farm Advisory System (FAS), are showcased to help farmers optimize their soil management practices through real-time data and analytics.

Operational Groups (OGs): France’s NRNs support cross-border OGs that address specific soil health issues. These groups work on practical solutions, such as developing soil fertility enhancement techniques and

Co-funded by the European Union
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation
This work has received funding from UK Research and Innovation (UKRI) under the UK government’s Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

promoting the use of cover crops to improve soil structure and health. The OG RARES in Burgundy, for example, unites advisers to support rural entrepreneurs with initiatives for soil health management

3.2.2 Innovation Strategy to Promote Soil Health Innovation

France's Open Innovation Strategy aims to promote soil health innovation by fostering collaboration among farmers, researchers, public authorities, and private entities. This strategy emphasizes several key aspects:

Knowledge and Technology Transfer: Facilitating the exchange of scientific research and practical knowledge related to soil health between universities, research institutions, and the agricultural sector. Implementing platforms for sharing data and best practices in soil management, ensuring that innovative solutions reach farmers quickly and efficiently.

Engagement and Collaboration: romoting partnerships between public bodies, private companies, and civil society to co-develop and implement soil health innovations. This includes joint projects, public-private partnerships, and collaborative research initiatives. Encouraging citizen involvement in soil health projects through educational programs and community-based initiatives

Digital Tools and Precision Agriculture: Developing and deploying digital tools that help farmers monitor soil conditions in real-time. These tools include sensors, drones, and satellite imagery to provide detailed soil health data. Promoting the use of precision agriculture techniques that optimize soil management practices, reduce the use of chemical inputs, and enhance soil biodiversity and structure.

Policy Support and Incentives: Creating policies that support sustainable soil management practices and provide incentives for adopting innovative soil health technologies. Implementing regulatory frameworks that encourage sustainable land use and soil conservation practices

Although many resources are available online, not all farmers have equal access to digital tools and platforms, which can limit the reach and impact of these innovations. Furthermore, securing continuous funding for innovative projects and providing sufficient incentives for farmers to adopt sustainable practices can be challenging.

3.3 Italy

Italy's Agriculture Knowledge and Innovation System (AKIS) is characterized by a mix of public and private advisory services with a strong focus on soil health. The National Rural Networks (NRNs) in Italy play a crucial role in fostering knowledge exchange and promoting innovation in soil management through thematic workshops, cross-border projects, and collaborative events. These initiatives aim to disseminate best practices and enhance sustainable soil management practices among farmers.

3.3.1 Key initiative

Soil Health Workshops: Italy organizes various workshops dedicated to soil health, focusing on sustainable soil management, soil fertility, and organic farming practices. Supported by NRNs and institutions like the Council for Agricultural Research and Economics (CREA), these workshops provide practical advice and insights from experts. For example, workshops on soil conservation techniques and the use of organic amendments have been held to improve farmers' understanding and practices

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Digital Innovation Workshops: Workshops covering the use of digital tools and platforms for soil monitoring and management are increasingly common. These sessions aim to equip farmers with the latest technologies for soil analysis and precision farming. Digital platforms, such as those developed under the Internet of Food & Farm 2020 (IoF2020) project, are showcased to help farmers optimize their soil management practices through real-time data and analytics.

Operational Groups (OGs): Italy's NRNs support cross-border OGs that address specific soil health issues. These groups work on practical solutions, such as developing soil fertility enhancement techniques and promoting the use of cover crops to improve soil structure and health. For instance, the OG ECOPIONET promotes organic farming and soil health through dedicated training and guidelines

3.3.2 Innovation strategy

Italy's open innovation strategy aims to promote soil health innovation by fostering collaboration among farmers, researchers, public authorities, and private entities. This strategy emphasizes several key aspects.

First, it facilitates the exchange of scientific research and practical knowledge related to soil health between universities, research institutions, and the agricultural sector. Implementing platforms for sharing data and best practices in soil management ensures that innovative solutions reach farmers quickly and efficiently.

Engagement and collaboration are also central to this strategy. It promotes partnerships between public bodies, private companies, and civil society to co-develop and implement soil health innovations. This includes joint projects, public-private partnerships, and collaborative research initiatives. Additionally, it encourages citizen involvement in soil health projects through educational programs and community-based initiatives.

Digital tools and precision agriculture are another focus area. The strategy involves developing and deploying digital tools that help farmers monitor soil conditions in real-time. These tools include sensors, drones, and satellite imagery to provide detailed soil health data. Promoting the use of precision agriculture techniques helps optimize soil management practices, reduce the use of chemical inputs, and enhance soil biodiversity and structure.

Finally, the strategy emphasizes policy support and incentives. Creating policies that support sustainable soil management practices and provide incentives for adopting innovative soil health technologies is crucial. Implementing regulatory frameworks that encourage sustainable land use and soil conservation practices further reinforces these efforts.

Resource accessibility remains an issue, particularly for farmers in less technologically advanced or rural areas. Many do not have access to the necessary digital tools and platforms. Enhancing digital literacy programs and improving infrastructure in underserved areas can help mitigate this problem, ensuring that all farmers can benefit from these innovations.

Despite these challenges, Italy's AKIS has a robust framework, with strong support from government agencies, research institutions, and the private sector. This structure provides a solid foundation to scale up successful initiatives and create models that can be replicated in other regions or countries.

Italy's active participation in Horizon 2020 and other cross-border projects brings cutting-edge research and innovation to its agricultural sector. Continuing to engage in international research collaborations will help Italy stay at the forefront of soil health innovations. Utilizing findings from these projects to inform national policies and practices can further enhance their impact.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

A wide range of educational resources, workshops, and digital tools is available in Italy to support soil health and sustainable practices. Expanding the reach and impact of these resources by translating them into multiple languages, adapting them to different regional contexts, and increasing the use of online platforms can help reach a broader audience.

The strong emphasis on collaboration among various stakeholders, including farmers, researchers, policymakers, and private companies, enhances the effectiveness of knowledge transfer and innovation dissemination. Fostering more multi-actor partnerships can lead to more holistic and practical solutions for soil health challenges.

Developing and deploying advanced digital tools for real-time soil monitoring is a key strength of Italy's AKIS. Investing in and promoting the adoption of these digital tools can significantly improve soil management practices. Precision agriculture can lead to more efficient use of resources and better soil health outcomes.

By addressing these challenges and leveraging the identified opportunities, Italy can further strengthen its AKIS framework, promoting sustainable soil management practices and enhancing agricultural productivity and resilience..

3.4 The Netherlands' AKIS and National Rural Networks (NRNs)

The Netherlands boasts a highly integrated Agriculture Knowledge and Innovation System (AKIS) with a strong emphasis on collaboration among farmers, researchers, and policymakers. The country's National Rural Networks (NRNs) play a crucial role in fostering knowledge exchange and innovation in soil health by organizing thematic workshops, cross-border projects, and interactive events. These activities aim to disseminate best practices and promote sustainable soil management techniques.

3.4.1 Key Initiatives

Soil Health Workshops: The Netherlands organizes various workshops focusing on soil health topics such as soil fertility, sustainable soil management, and organic farming practices. These workshops, often supported by NRNs and research institutions like Wageningen University & Research (WUR), provide farmers with practical advice and insights from leading experts. For example, workshops on precision agriculture and soil nutrient management have been instrumental in enhancing soil health practices across the country.

Digital Innovation Workshops: These workshops cover the use of digital tools and platforms for soil monitoring and management. They aim to equip farmers with the latest technologies for soil analysis and precision farming. Platforms like SmartAgriHubs and digital tools developed under initiatives such as the Internet of Food & Farm 2020 (IoF2020) are showcased to help farmers optimize their soil management practices through real-time data and analytics.

Horizon 2020 Projects: The Netherlands actively participates in Horizon 2020 projects, collaborating with other EU countries to develop and implement innovative soil health practices. These projects facilitate the exchange of knowledge and technologies across borders, enhancing the overall impact on soil health. Examples include projects focused on soil biodiversity, sustainable land management, and the integration of new technologies in farming practices.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Operational Groups (OGs): The NRNs in the Netherlands support cross-border OGs that tackle specific soil health issues. These groups work on practical solutions such as improving soil structure through the use of cover crops, enhancing soil organic matter, and adopting conservation tillage practices. The collaboration often involves multiple countries working together to address common soil health challenge.

3.4.2 Promotion of innovation

The Netherlands' Open Innovation Strategy aims to promote soil health innovation by fostering collaboration among farmers, researchers, public authorities, and private entities. This strategy emphasizes several key aspects.

Central to this strategy is the facilitation of knowledge and technology transfer. By encouraging the exchange of scientific research and practical knowledge related to soil health between universities, research institutions, and the agricultural sector, the Netherlands ensures that innovative solutions are accessible. Implementing platforms for sharing data and best practices in soil management helps ensure that these solutions reach farmers quickly and efficiently.

Engagement and collaboration are also crucial components. The strategy promotes partnerships between public bodies, private companies, and civil society to co-develop and implement soil health innovations. This includes joint projects, public-private partnerships, and collaborative research initiatives. Additionally, the strategy encourages citizen involvement in soil health projects through educational programs and community-based initiatives, fostering a more inclusive approach to innovation.

A significant focus is placed on digital tools and precision agriculture. The strategy involves developing and deploying digital tools that help farmers monitor soil conditions in real-time. These tools include sensors, drones, and satellite imagery, which provide detailed soil health data. Promoting the use of precision agriculture techniques helps optimize soil management practices, reduce the use of chemical inputs, and enhance soil biodiversity and structure.

Policy support and incentives are also integral to the strategy. By creating policies that support sustainable soil management practices and providing incentives for adopting innovative soil health technologies, the Netherlands encourages widespread adoption of best practices. Implementing regulatory frameworks that promote sustainable land use and soil conservation practices further reinforces these efforts.

This comprehensive approach to promoting soil health innovation positions the Netherlands as a leader in sustainable agricultural practices, ensuring that its farming sector remains resilient and productive.

The Netherlands' Agricultural Knowledge and Innovation System (AKIS) plays a crucial role in driving sustainable agricultural practices and enhancing productivity. However, it faces several challenges that need to be addressed to fully leverage its potential. Alongside these challenges, there are significant opportunities.

One major challenge within the Dutch AKIS is the fragmentation of efforts. The diverse array of actors, including government agencies, research institutions, NGOs, and farmers, often leads to redundant initiatives and a lack of coordination. This fragmentation hampers the efficiency and integration of efforts aimed at improving agricultural practices.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

To address this, establishing centralized coordination platforms is essential. These platforms can streamline activities, reduce redundancy, and ensure efficient resource utilization. The “Smart AKIS” initiative[3] is a promising example, aiming to create a networked system that integrates various stakeholders, fostering collaboration and minimizing fragmented efforts..

Expanding digital literacy programs and improving infrastructure in underserved areas are critical steps. Programs such as “AgriCoach”[4] focus on enhancing digital skills among farmers and providing the necessary support to improve infrastructure in rural regions. This approach can help bridge the digital divide and ensure that all farmers benefit from technological advancements.

Advocating for more public and private investment and developing diverse funding mechanisms are essential strategies. The “Green Fund”[5] initiative, for instance, aims to provide financial incentives for farmers adopting sustainable practices, ensuring continued investment in innovative agricultural projects. This can create a supportive financial environment that encourages the adoption of sustainable practices.

3.5 Poland

Poland’s Agriculture Knowledge and Innovation System (AKIS) is characterized by a strong emphasis on practical and accessible knowledge platforms that facilitate the adoption of sustainable soil management practices. The National Rural Networks (NRNs) in Poland play a crucial role in fostering knowledge exchange and promoting innovation in soil management through thematic workshops, cross-border projects, and collaborative events. These initiatives aim to disseminate best practices and enhance sustainable soil management practices among farmers.

3.5.1 Key Initiatives

Soil Health Workshops: Poland organizes numerous workshops dedicated to soil health, focusing on sustainable soil management, soil fertility, and organic farming practices. These workshops, often supported by NRNs and institutions like the Institute of Soil Science and Plant Cultivation (IUNG-PIB), provide farmers with practical advice and insights from leading experts. For example, workshops on soil conservation techniques and the use of organic amendments have been held to improve farmers' understanding and practices

Digital Innovation Workshops: Workshops covering the use of digital tools and platforms for soil monitoring and management are increasingly common. These sessions aim to equip farmers with the latest technologies

[3] https://ec.europa.eu/eip/agriculture/en/find-connect/projects/smart-akis-european-agricultural-knowledge-and.html

[4] https://www.agricoach.nl/

[5] https://ondernemersplein.kvk.nl/groenprojecten/

Co-funded by the European Union
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation
This work has received funding from UK Research and Innovation (UKRI) under the UK government’s Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

for soil analysis and precision farming. Digital platforms like the "Doradca Rolniczy" (Agricultural Advisor) app[6] are showcased to help farmers optimize their soil management practices through real-time data and analytics.

Operational Groups (OGs): Poland's NRNs support cross-border OGs that address specific soil health issues. These groups work on practical solutions, such as developing soil fertility enhancement techniques and promoting the use of cover crops to improve soil structure and health.

3.5.2 Innovation strategy

Poland's Open Innovation Strategy aims to promote soil health innovation by fostering collaboration among farmers, researchers, public authorities, and private entities. This strategy emphasizes several key aspects:

Knowledge and Technology Transfer:Facilitating the exchange of scientific research and practical knowledge related to soil health between universities, research institutions, and the agricultural sector.

Implementing platforms for sharing data and best practices in soil management, ensuring that innovative solutions reach farmers quickly and efficiently

Developing and deploying digital tools that help farmers monitor soil conditions in real-time. These tools include sensors, drones, and satellite imagery to provide detailed soil health data.

Promoting the use of precision agriculture techniques that optimize soil management practices, reduce the use of chemical inputs, and enhance soil biodiversity and structure

Poland's Agricultural Knowledge and Innovation System (AKIS) faces several challenges, but also offers significant opportunities to enhance sustainable soil management practices and agricultural productivity.

Securing ongoing funding for innovative projects and creating sufficient incentives for sustainable practice adoption is another challenge. Advocating for more public and private investment and developing diverse funding mechanisms can support farmers and ensure the sustainability of innovative agricultural projects.

By addressing these challenges and leveraging the identified opportunities, Poland can further strengthen its AKIS framework, promoting sustainable soil management practices and enhancing agricultural productivity and resilience.

3.6 Spain

Spain's Agriculture Knowledge and Innovation System (AKIS) is robust, with significant emphasis on fostering knowledge exchange and promoting soil health through the integration of National Rural Networks (NRNs). These networks play a crucial role in organizing thematic workshops, cross-border projects, and collaborative

[6] https://doradca-rolniczy.pl/aplikacja-na-smartfony-dla-rolnikow/#:~:text=Aplikacja%20Agro%2Dalarm%20jest%20bezp%C5%82atna,cenne%20doradztwo%20dla%20ka%C5%BCdego%20rolnika.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

events that bring together farmers, researchers, and advisors. The goal is to disseminate best practices and enhance sustainable soil management practices among farmers.

3.6.1 Key Initiatives

Spain organizes various workshops focused on soil health, sustainable soil management, soil fertility, and organic farming practices. Supported by NRNs and research institutes, these workshops provide practical advice and insights from experts. For example, workshops on soil conservation techniques and the use of organic amendments have been held to enhance farmers' understanding and practices. Specific examples include workshops on Regenerative Agriculture which aim to improve soil structure and health through innovative farming practices

Operational Groups (OGs): Spain's NRNs support cross-border OGs that address specific soil health issues. These groups work on practical solutions, such as developing soil fertility enhancement techniques and promoting the use of cover crops to improve soil structure and health. The OG ECOPIONET[7] promotes organic farming and soil health through dedicated training and guidelines

3.6.2 Innovation strategy

Spain's Open Innovation Strategy aims to promote soil health innovation by fostering collaboration among farmers, researchers, public authorities, and private entities. This strategy emphasizes several key aspects:

Facilitating the exchange of scientific research and practical knowledge related to soil health between universities, research institutions, and the agricultural sector.

Implementing platforms for sharing data and best practices in soil management, ensuring that innovative solutions reach farmers quickly and efficiently

Engagement and Collaboration: Promoting partnerships between public bodies, private companies, and civil society to co-develop and implement soil health innovations. This includes joint projects, public-private partnerships, and collaborative research initiatives.

Encouraging citizen involvement in soil health projects through educational programs and community-based initiatives.

Digital Tools and Precision Agriculture: Developing and deploying digital tools that help farmers monitor soil conditions in real-time. These tools include sensors, drones, and satellite imagery to provide detailed soil health data.

Promoting the use of precision agriculture techniques that optimize soil management practices, reduce the use of chemical inputs, and enhance soil biodiversity and structure.

[7] https://ec.europa.eu/eip/agriculture/sites/default/files/ecopionet_info_raquel_arroyo_09sept2020-ii.pdf

Co-funded by the European Union
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation
This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Policy Support and Incentives: Creating policies that support sustainable soil management practices and provide incentives for adopting innovative soil health technologies.

Implementing regulatory frameworks that encourage sustainable land use and soil conservation practices

3.7 Switzerland

Switzerland's Agriculture Knowledge and Innovation System (AKIS) stands out for its high level of integration and emphasis on environmental sustainability and soil health. The National Rural Networks (NRNs) play a critical role by facilitating knowledge exchange and driving innovation in soil management. These networks organize thematic workshops, cross-border projects, and interactive events that gather farmers, researchers, and advisors to disseminate best practices and enhance sustainable soil management practices.

3.7.1 Key Initiatives

Switzerland conducts various Soil Health Workshops that emphasize sustainable soil management, soil fertility, and organic farming practices. These workshops, supported by NRNs and institutions like Agroscope, offer farmers practical advice and insights from leading experts. Notable workshops on soil conservation techniques and the application of organic amendments have been instrumental in advancing farmers' knowledge and practices.

Additionally, Digital Innovation Workshops are held to educate farmers on the use of advanced digital tools and platforms for soil monitoring and management. These workshops aim to equip farmers with cutting-edge technologies for soil analysis and precision farming. Initiatives like SmartAgriHubs demonstrate digital platforms and tools that help farmers optimize their soil management through real-time data and analytics.

Switzerland's NRNs also support Operational Groups (OGs) that address specific soil health issues through cross-border collaborations. These groups focus on practical solutions, such as enhancing soil fertility and promoting cover crops to improve soil structure and health. For example, the OG "Soil Health and Microbiome" aims to boost soil biodiversity through targeted interventions and collaborative research.

3.7.2 Innovation Strategy

Switzerland's innovation strategy aims to advance soil health innovation through collaboration among farmers, researchers, public authorities, and private entities. This strategy highlights the importance of knowledge and technology transfer by facilitating the exchange of scientific research and practical knowledge related to soil health among universities, research institutions, and the agricultural sector. Platforms are implemented for sharing data and best practices in soil management, ensuring innovative solutions reach farmers effectively.

Engagement and collaboration are key, promoting partnerships between public bodies, private companies, and civil society to co-develop and implement soil health innovations. This includes joint projects, public-private partnerships, and collaborative research initiatives. Citizen involvement is encouraged through educational programs and community-based initiatives.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

The strategy also focuses on developing and deploying digital tools to help farmers monitor soil conditions in real-time. These tools, including sensors, drones, and satellite imagery, provide detailed soil health data. Precision agriculture techniques are promoted to optimize soil management practices, reduce chemical inputs, and enhance soil biodiversity and structure.

Policy support and incentives play a crucial role in this strategy, with policies created to support sustainable soil management practices and provide incentives for adopting innovative soil health technologies. Regulatory frameworks are implemented to encourage sustainable land use and soil conservation practices.

Switzerland faces several challenges and opportunities within its AKIS framework. Fragmentation of efforts is a major challenge, as the diverse array of actors involved can lead to redundancy in initiatives, complicating coordination and integration. Establishing centralized coordination platforms can streamline efforts and ensure efficient resource utilization.

Another challenge is the adoption of innovations. There is often a gap between the availability of innovative solutions and their adoption by farmers, partly due to a lack of awareness or skepticism about new practices. Increasing outreach and demonstration projects to showcase the benefits and practical applications of new technologies and methods can bridge this gap.

3.8 The United Kingdom

The United Kingdom's Agriculture Knowledge and Innovation System (AKIS) is distinguished by its strong focus on digital platforms and precision agriculture. The National Rural Networks (NRNs) are crucial for fostering knowledge exchange and promoting innovation in soil management. These networks organize thematic workshops, cross-border projects, and interactive events that unite farmers, researchers, and advisors to share best practices and enhance sustainable soil management practices.

3.8.1 Key Initiatives

In the UK, Soil Health Workshops are designed to focus on sustainable soil management, soil fertility, and organic farming practices. Supported by NRNs and institutions such as Rothamsted Research and the James Hutton Institute, these workshops provide practical advice and insights from leading experts. The Agriculture and Horticulture Development Board (AHDB) organizes workshops aimed at improving soil structure and health through innovative farming practices.

Digital Innovation Workshops in the UK cover the use of digital tools and platforms for soil monitoring and management, equipping farmers with the latest technologies for soil analysis and precision farming. Platforms like the "Farming Advice Service" and digital tools developed under projects like "Agri-Tech East" are showcased to help farmers optimize their soil management through real-time data and analytics.

Operational Groups (OGs) supported by the UK's NRNs addressed specific soil health issues through cross-border collaborations. These groups worked on practical solutions such as enhancing soil fertility and promoting the use of cover crops to improve soil structure and health. However their results were also

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

assessed critical. The OG "Soil Health Partnership" focused on improving soil biodiversity through targeted interventions and collaborative research[8].

3.8.2 Innovation Strategy

The UK's Open Innovation Strategy aims to foster soil health innovation through collaboration among farmers, researchers, public authorities, and private entities. The strategy emphasizes knowledge and technology transfer, facilitating the exchange of scientific research and practical knowledge related to soil health among universities, research institutions, and the agricultural sector. Platforms for sharing data and best practices in soil management ensure that innovative solutions reach farmers efficiently.

Engagement and collaboration are also central to the UK's strategy, promoting partnerships between public bodies, private companies, and civil society to co-develop and implement soil health innovations. This includes joint projects, public-private partnerships, and collaborative research initiatives. Educational programs and community-based initiatives encourage citizen involvement in soil health projects.

Digital tools and precision agriculture are core elements of the strategy, with a focus on developing and deploying tools that help farmers monitor soil conditions in real-time. These tools, including sensors, drones, and satellite imagery, provide detailed soil health data. Precision agriculture techniques are promoted to optimize soil management practices, reduce chemical inputs, and enhance soil biodiversity and structure.

Policy support and incentives are vital, with policies created to support sustainable soil management practices and provide incentives for adopting innovative soil health technologies. Regulatory frameworks are designed to encourage sustainable land use and soil conservation practices.

[8] https://ahdb.org.uk/soil-biology-and-soil-health-partnership

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

4 Evaluation of soil advice training supply

To provide an evaluation of the soil advice training supply in Europe, we adopted a multi-actor approach seeking to collect a broad range of stakeholder views through qualitative interviewing. This method ensures that we gained understanding of the challenges and expectations of actors involved in the development or the provision of training resources to soil advisors.

We conducted interviews with a broad range of stakeholder (from professional organisations, education and training institutions, research, policy or experienced soil advisors). The sample consisted of 5-8 experts in each NBSOIL partner country. We seek to ensure diversity in terms of the areas of expertise covered (agriculture, forestry, restoration or industrial) and institutional diversity. Interviewees were mainly selected for their area of expertise and institutional affiliation. Socio-demographics of respondents were not recorded.

Stakeholder type	Number of interviewees
Agricultural advisors, self-employed or working in an independent advising company	9
Agricultural advisors, working for a public administration (national or regional) or a public-private organisation providing advice	6
Instructors/experts, working in organisations training or certifying advisors (Agricultural schools, Universities/Research institutes, or other organisations offering training)	9
Officers working in public administration (National or regional, Departments of agriculture, agronomic experts)	5
Organic certification specialist	1
Knowledge transfer specialist	2
Members of producers' organisation/farmers' unions	2
Soil expert/researcher (academic)	2
Environmental expert (independent/private company)	5
Expert in forestry training	2
Outdoor facilities manager	1
Farmers peer group managers	1
Undetermined	1
Total	**46**

Table 1. Overview of interview respondents for the supply side survey.

To ensure the involvement of a diverse range of stakeholders for the supply side assessment, we encouraged the partners to adopt a maximum variation approach when selecting the qualitative sample. This enabled to

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

ensure a diversity among respondents and to cover all sectors targeted by NBSOIL. Through this method, we engaged with 46 stakeholders in the NBSOIL partner countries. While there is an overrepresentation of respondents working in/ for the agricultural sector, we also included respondents with expertise in forest soils as well as industrial and restored soils. Table 1. summarizes the category of stakeholders involved. It clusters the professional descriptions provided by the respondents.

4.1 Austria

4.1.1 Expertise Acquisition

In Austria, soil advisors primarily gain their expertise through a combination of governmental training programs, partnerships with research projects, and formal education at universities such as the NBSOIL partner BOKU (University of Natural Resources and Life Sciences). Additionally, soil advisors often enhance their knowledge through online searches for scientific papers and participation in environmental management programs. Practical experience and interactions with experts from agricultural ministries and universities also play crucial roles in developing their expertise.

4.1.2 Certifications

There is no specific certification required for soil advisors in Austria. While certain advisors working for ministries may need certification, "pure soil advisors" do not have a distinct certification process. The certification requirements are more common for other types of advisors, such as those involved in broader agricultural advisory roles.

4.1.3 Training Resources

Training resources for soil advisors in Austria are diverse and include courses offered by agricultural chambers, universities, and various organizations involved in sustainability and environmental management. These resources are disseminated through newsletters, social media, and online platforms. Events such as the “Wintertagung” from the Ökosoziales Forum[9] and webinars on climate change topics also provide valuable learning opportunities. The focus of these resources often includes nutrient cycles, soil health, and environmental sustainability.

4.1.4 Providers

The primary providers of training resources are universities (notably BOKU), agricultural chambers, and various environmental and agricultural organizations. These institutions collaborate to offer courses, workshops, and online content aimed at enhancing the knowledge and skills of soil advisors. Additionally,

[9] https://oekosozial.at/en/die-wintertagung-des-oekosozialen-forums/

Co-funded by the European Union
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation
This work has received funding from UK Research and Innovation (UKRI) under the UK government’s Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

events organized by forums and associations like ÖGUT (Austrian Society for Environment and Technology)[10] play a significant role in knowledge dissemination.

4.1.5 Funding

Funding for the development and provision of training resources comes from several sources, including government programs, public funding, and projects funded by the EU or national initiatives. Courses at universities and public institutions are often publicly funded, and there are usually no participant fees. Some training resources are supported by taxpayer money and governmental programs, ensuring accessibility to a broad audience.

4.1.6 Challenges

One of the main challenges faced by soil advisors in Austria is the difficulty in finding comprehensive information and specific contacts for inquiries. Although online courses have become more prevalent, they lack the networking opportunities that in-person events provide. Moreover, the availability of targeted education resources is limited, and there is a need for a centralized platform that consolidates information on available courses and training opportunities.

4.1.7 Overall Evaluation

The provision of training and information resources for soil advisors in Austria is extensive and varied, supported by robust governmental and institutional backing. However, the system is somewhat fragmented, with a lack of centralized information making it difficult for advisors to find and access all available resources. The quality of resources is high, reflecting the strong emphasis on environmental management and sustainable practices. To further enhance the effectiveness of soil advisory services, developing a centralized platform for information and improving networking opportunities could be beneficial. This would help in addressing the gaps in accessibility and ensuring that soil advisors are well-equipped to meet the demands of their roles.

4.2 France

4.2.1 Expertise Acquisition

In France, soil consultants acquire their expertise through various methods. Traditional educational pathways, such as engineering schools and universities, provide a foundational knowledge. However, much of the expertise is developed through self-training, field experiences, and continuous interaction with soil scientists and agronomists. Networking and attending conferences play a significant role, with organizations such as

[10] See https://www.oegut.at/de/news/2017/03/video-expertinnen-boden.php or https://www.oegut.at/de/events/2015/04/film_zukunft-pflanzen.php for soil related dissemination activities of ÖGUT.

Co-funded by the European Union
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation
This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Arvalis[11] and INRAE offering valuable resources and insights. The emphasis on practical, in-field learning has increased over the years, providing consultants with more opportunities to apply their knowledge directly in agricultural settings.

4.2.2 Certifications

Currently, there is no formal certification requirement for soil consultants in France. This absence of mandatory certification suggests a reliance on academic qualifications and professional experience to validate the expertise of soil advisors. While there are agronomists and other specialists who offer soil advice, their credentials are typically not specific to soil consultancy.

4.2.3 Training Resources

Several types of training resources are available to soil consultants in France. These include bachelor's and master's degree programs in agronomy and related fields, publications from France Agricole[12], and various networks applying TCS (Techniques Culturales simplifies). Additionally, online platforms like Icosystem[13] and Celestalab[14] offer both online and in-person training. Specialized journals, YouTube videos from producers like Ver de Terre[15], and practical experimentation through field training are also prominent resources.

4.2.4 Providers

Training resources are provided by a mix of universities, private organizations, and professional associations. Notable institutions include the University of Amiens, ESA Angers, and ENSAT Toulouse. Associations like BASE[16] and various publishing houses also contribute significantly. These providers offer a range of resources from structured degree programs to more informal, practice-oriented learning opportunities.

4.2.5 Funding

The development and provision of these training resources are funded through a combination of educational scholarships, self-funding by consultants, and sales of educational materials. Universities and private organizations charge for their courses, while some resources like videos and online content are freely accessible. Membership fees and public funding also support the dissemination of knowledge.

---

[11] https://www.arvalis.fr/

[12] https://www.editions-france-agricole.fr/livres-et-ebooks/agroalimentaire.html

[13] https://www.icosysteme.com/notre-catalogue-de-formation/

[14] https://celesta-lab.fr/formations-sur-la-biologie-des-sols/

[15] https://www.verdeterreprod.fr/

[16] https://asso-base.fr/

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

4.2.6 Challenges

Accessing these resources poses several challenges. There is a notable difficulty in finding comprehensive, structured information due to the decentralized nature of training offerings. While online resources are abundant, the lack of hands-on, practical training remains a significant gap. Furthermore, awareness of available resources is limited, making it challenging for consultants to identify and utilize them effectively.

4.2.7 Overall Evaluation

The provision of training and information resources for soil advisors in France is varied and somewhat fragmented. There is a robust foundation of traditional educational programs and a growing presence of online and practical training resources. However, the lack of formal certification and the decentralized nature of information pose significant challenges. The resources available are of high quality but not always easily accessible or well-publicized. To improve the effectiveness of soil advisory services, a more structured and centralized approach to training and certification may be beneficial. Enhanced awareness and promotion of available resources could also help bridge the existing gaps, ensuring that soil advisors can access the necessary knowledge and skills to perform their roles effectively.

4.3 Italy

4.3.1 Expertise Acquisition

In Italy, soil advisors primarily gain their expertise through personal experiences and formal education in agronomy, forestry, or geology. Although university programs provide some foundational knowledge in pedology, most soil advisors enhance their expertise through practical, hands-on work in the field. The existing soil advisors typically have a master's degree in related fields, but their depth of knowledge often comes from real-world applications rather than academic training. High schools and universities offer some training, but these are generally basic and not well-connected to practical soil management.

4.3.2 Certifications

There is no formal certification requirement for soil advisors in Italy. The lack of certification means that the expertise of soil advisors is largely validated by their educational background and practical experience. This absence of certification is seen as a gap, as it might contribute to the lack of recognition for the role of soil advisors, both among farmers and other stakeholders.

4.3.3 Training Resources

Specific training resources for soil advisors in Italy are limited. While there are some regional soil maps and databases used by agronomists, most training comes from online resources, webinars, and workshops, often provided by international associations such as the American Soil Science Society or regenerative agriculture groups. Some European projects and regional initiatives offer sporadic courses and educational videos, but these are not widespread. There are also some co-financed projects within European training programs aimed at organizing short courses and student exchanges on pedology.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

4.3.4 Providers

The providers of training resources in Italy include high schools, universities, regional development agencies, and professional associations. These organizations occasionally offer workshops, webinars, and spot courses, often funded by European or regional projects. However, the involvement of private organizations in producing training resources is relatively low compared to the agricultural sector.

4.3.5 Funding

Funding for the development and provision of training resources comes from a mix of private payments, European funds, and regional projects. Courses are typically available to practitioners upon payment, and some initiatives are supported by regional organizations or European programs. Despite the availability of funds for specific projects, the overall funding landscape is fragmented, leading to inconsistency in the availability and quality of training resources.

4.3.6 Challenges

Several challenges hinder the effective provision of training resources for soil advisors in Italy. These include a lack of awareness and limited existence of specific courses, inadequate publicizing of successful project workshops, and technical barriers such as frequent changes to websites hosting educational content. Additionally, there is a lack of a unified platform for reporting and accessing training initiatives, resulting in a reliance on word-of-mouth or personal networks to discover available resources.

4.3.7 Overall Evaluation

The training and information resources for soil advisors in Italy are sparse and fragmented, with a significant reliance on personal initiative and informal networks to acquire expertise. The lack of certification and a centralized information platform further exacerbates the challenges faced by soil advisors. While some high-quality resources exist, particularly from international sources and European projects, their reach and impact are limited by poor awareness and accessibility issues. To improve the situation, Italy could benefit from developing a more structured approach to soil advisor training, including formal certification, better promotion of existing resources, and the creation of a centralized platform to consolidate and disseminate information on available training opportunities.

4.4 The Netherlands

4.4.1 Expertise Acquisition

In the Netherlands, soil advisors acquire their expertise through a combination of formal education, professional training, and practical experience. Advisors typically have academic backgrounds in soil, water, and atmosphere studies, with degrees from institutions such as Wageningen University & Research (WUR). Continuing education plays a crucial role, with advisors attending courses, webinars, and field days. Professional journals, open days from research programs, and internal knowledge networks also contribute to

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

their ongoing learning. Practical experience gained from working directly with farmers and other stakeholders is highly valued and complements their formal education.

4.4.2 Certifications

There is no specific mandatory certification for soil advisors in the Netherlands. However, various training programs offer certificates upon completion. For instance, the certification of soil consultants is provided in cooperation with governmental bodies and organizations like DAW (Sustainable Agriculture and Water Management). These certificates indicate a level of proficiency and are often necessary for specific advisory roles, particularly in regulatory or compliance contexts.

4.4.3 Training Resources

A wide array of training resources is available to soil advisors in the Netherlands. These include:

- Bachelor's and Master's degree programs in soil science and related fields from universities such as WUR.
- Professional courses and workshops offered by institutions like Terra Practicus[17] and NEN[18].
- Online webinars and seminars from organizations such as Commissie Bemesting Akkerbouw/ Vollegrondsgroententeelt (CBAV)[19] and various agricultural bodies.
- Practical training sessions and open days organized by WUR and other research institutions.
- Specialized courses on topics like soil description, geotechnical engineering, and environmental soil assessment.

These resources cover both theoretical knowledge and practical skills, ensuring that advisors are well-rounded in their expertise.

4.4.4 Providers

Training resources are provided by a diverse group of institutions:

- Universities, notably Wageningen University & Research (WUR) and Aeres University of Applied Sciences.
- Specialized training organizations such as Terra Practicus and NEN.
- Governmental bodies and research institutions involved in agriculture and environmental management.
- Private organizations offering customized training for specific standards and certifications.
- Professional associations and networks that facilitate knowledge exchange and professional development.

[17] https://www.terrapracticus.nl/en/activities/

[18] https://www.nen.nl/normcommissie-bodemgezondheid

[19] https://www.bo-akkerbouw.nl/

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

These providers collaborate to offer a comprehensive range of educational and training opportunities for soil advisors.

4.4.5 Funding

Funding for training resources comes from various sources:

- Governmental support through ministries and public research programs.
- Participant fees for courses and workshops.
- Funding from research programs and collaborative projects between universities and governmental bodies.
- Private sector funding from companies seeking specific training for their employees.
- Grants and subsidies for educational and professional development initiatives.

This multifaceted funding landscape ensures a steady supply of resources, though coordination and consistency can sometimes be an issue.

4.4.6 Challenges

Several challenges impact the training and professional development of soil advisors in the Netherlands:

- A lack of comprehensive, centralized information about available courses and training opportunities.
- Limited opportunities for practical, hands-on training, which is essential for developing applied skills.
- The need for continuous improvement in training offerings to keep pace with advances in soil science and sustainable practices.
- Ensuring that training is accessible to all potential advisors, including those from diverse backgrounds and career stages.
- Balancing theoretical knowledge with practical application in training programs to ensure relevance and effectiveness.

Addressing these challenges is crucial for maintaining a high standard of soil advisory services.

4.4.7 Overall Evaluation

The training and information resources for soil advisors in the Netherlands are extensive and well-supported by a robust network of educational institutions, professional organizations, and government bodies. However, there is a need for better coordination and centralization of information to improve accessibility and efficiency. Practical, hands-on training opportunities should be expanded to complement the strong theoretical foundation provided by universities and formal courses. By addressing these challenges, the Netherlands can further enhance the quality and effectiveness of its soil advisory services, ensuring that advisors are well-equipped to support sustainable soil management practices.

4.5 Spain

4.5.1 Expertise Acquisition

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Soil advisors in Spain acquire their expertise primarily through formal education and practical experience. Educational programs related to agronomy, forestry, and geology provide a basic foundation in soil science. Most soil advisors enhance their knowledge through fieldwork, self-study, and continuous interaction with other experts. The practical application of knowledge gained during university education is crucial, as the university training related to soil is often basic and not well connected to real-life applications. Additionally, there are regional soil maps and databases that advisors use to inform their recommendations.

4.5.2 Certifications

There is no formal certification required for soil advisors in Spain. This lack of certification implies that the validation of a soil advisor's expertise relies heavily on their educational background and practical experience. While this system allows for flexibility, it also means that there is no standardized measure of competence for soil advisors across the country.

4.5.3 Training Resources

The available training resources for soil advisors in Spain include online resources, webinars, workshops, and some regional initiatives. International associations and regenerative agriculture groups provide valuable online content. Specific initiatives from European co-financed projects and regional programs offer sporadic courses and educational videos. However, these resources are not extensive and often require active searching by the advisors themselves.

4.5.4 Providers

Training resources are provided by a mix of high schools, universities, regional development agencies, and professional associations. These institutions occasionally organize workshops, webinars, and spot courses, often funded by European or regional projects. Private organizations play a relatively minor role in producing training resources compared to those available to agronomists.

4.5.5 Funding

The funding for the development and provision of training resources comes from various sources, including private payments, European funds, and regional projects. Courses are typically available to practitioners upon payment, and some initiatives are supported by regional organizations or European programs. Despite these funding sources, the overall provision of resources remains inconsistent and fragmented.

4.5.6 Challenges

Several challenges hinder the effective provision of training resources for soil advisors in Spain. There is a significant lack of awareness about the existence of specific courses and resources. Technical barriers, such as frequent changes to websites hosting educational content, also pose challenges. Moreover, there is no centralized platform to report and access training initiatives, making it difficult for advisors to stay informed about available opportunities. This fragmentation leads to reliance on word-of-mouth or personal networks to discover resources.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

4.5.7 Overall Evaluation

The training and information resources for soil advisors in Spain are sparse and fragmented. Advisors often rely on personal initiative and informal networks to acquire the necessary expertise. The absence of formal certification and a centralized information platform further complicates the training landscape. While high-quality resources exist, particularly from international sources and European projects, their impact is limited by poor awareness and accessibility issues. To improve the situation, a more structured approach to soil advisor training is needed, including the development of formal certification programs, better promotion of existing resources, and the creation of a centralized platform to consolidate and disseminate information on available training opportunities.

4.6 Switzerland

4.6.1 Expertise Acquisition

In Switzerland, soil advisors gain their expertise through a combination of formal education and practical experience. Educational programs in agriculture, geography, and agronomy provide a foundation, with institutions like HAFL (School of Agricultural, Forest, and Food Sciences) and ETH Zurich playing key roles. Advisors often pursue additional training through specialized courses and programs offered by universities and organizations focused on soil science. Practical experience is highly valued, with many advisors learning on the job, through PhD research, and by participating in fieldwork and professional networks.

4.6.2 Certifications

There is no mandatory certification for soil advisors in Switzerland. However, some private educational programs, such as those in regenerative agriculture, offer certifications. The lack of a standardized certification process means that advisors rely on their educational background and professional experience to establish their credibility. Courses like the Bodenpraktiker*innen[20] at FiBL (Research Institute of Organic Agriculture) provide targeted training, but certification is not a formal requirement for practicing soil advisors.

4.6.3 Training Resources

Training resources available to soil advisors in Switzerland include:

- Academic programs in agronomy, biology, environmental sciences, and civil engineering.
- Specialized courses such as the CAS (Certificate of Advanced Studies) in soil mapping from HAFL[21]

[20] https://www.fibl.org/en/themes/projectdatabase/projectitem/project/2396

[21] https://www.bfh.ch/de/weiterbildung/cas/bodenkartierung/

Co-funded by the European Union
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation
This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

- Modular training programs, like those offered by sanu. for pedological construction supervision[22].
- Continuous education opportunities through organizations like Agridea[23] and HAFL[24].
- Practical courses and workshops provided by research institutes like FiBL or Foundations like SANU Durabilitas who maintains a database on soil quality[25].

These resources encompass both theoretical knowledge and practical skills, aiming to equip soil advisors with comprehensive expertise.

4.6.4 Providers

A diverse range of institutions provides training resources for soil advisors in Switzerland:

- Universities and higher education institutions like HAFL, ETH Zurich, and ZHAW.
- Research institutes such as FiBL and WSL (Swiss Federal Institute for Forest, Snow and Landscape Research).
- Non-governmental organizations (NGOs) and professional associations involved in environmental and agricultural sectors.
- Private organizations offering courses in specific areas like regenerative agriculture and soil health.

These providers collaborate to deliver a wide array of training programs, from formal academic courses to practical, field-based workshops.

4.6.5 Funding

Funding for the development and provision of training resources in Switzerland comes from multiple sources:

- Governmental support through cantonal and federal offices.
- Public funding for educational institutions and research projects.
- Private funding from organizations and course participants.
- NGOs and international projects contributing to specific training initiatives.
- Cooperative programs involving multiple stakeholders, including public and private entities.

The diverse funding landscape ensures that a variety of training opportunities are available, though it also leads to some variability in resource availability.

4.6.6 Challenges

[22] https://www.sanu.ch/fr/event/weiterbildung-bodenkundliche-baubegleitung-bbb-134/register

[23] https://www.agridea.ch/de/themen/umwelt-und-landwirtschaft/thematisches-netzwerk-boden/

[24] https://www.bfh.ch/de/forschung/forschungsbereiche/bodennutzung-bodenschutz/

[25] https://www.bodenqualitaet.ch/

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Several challenges affect the provision and accessibility of training resources for soil advisors in Switzerland:

- Limited targeted education specifically for soil advisors, with many resources integrated into broader agricultural and environmental programs.
- Difficulty in finding comprehensive, centralized information on available courses and training opportunities.
- A need for more practical, hands-on training that translates theoretical knowledge into applicable skills.
- Gaps in methodological education on advising and relationship-building, which are crucial for effective soil management.
- The decentralized nature of training offerings and the need for more focused, practical training are significant hurdles that soil advisors face.

4.6.7 Overall Evaluation

The training and information resources for soil advisors in Switzerland are extensive and supported by strong institutional and governmental backing. However, the system is somewhat fragmented, with a lack of centralized information making it challenging for advisors to access all available resources easily. The quality of training is high, reflecting a strong emphasis on both theoretical knowledge and practical skills. Addressing the gaps in practical training and creating a more centralized platform for information could enhance the effectiveness of soil advisory services. By improving accessibility and coordination of resources, Switzerland can ensure that soil advisors are well-equipped to meet the demands of their roles and contribute effectively to sustainable soil management practices.

4.7 The United Kingdom

4.7.1 Expertise Acquisition

In the UK, soil advisors acquire their expertise through a mix of formal education, professional courses, and practical experience. Advisors often have academic backgrounds in geography, environmental management, agriculture, or related fields, with early career training occurring through university programs. Continuing Professional Development (CPD) is also significant, although there are limited CPD-specific courses. Organizations like the British Society of Soil Science (BSSS) and BASIS offer supplementary courses, though these are not always accredited. Peer-to-peer learning, attending events by Catchment Sensitive Farming[26], and online courses from institutions such as Cornell University provide additional knowledge. Field experience remains crucial, with advisors frequently gaining insights from on-the-job training and interactions with farmers and other professionals.

4.7.2 Certifications

[26] https://www.gov.uk/guidance/catchment-sensitive-farming-reduce-agricultural-water-pollution

Co-funded by the European Union
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation
This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

The UK lacks a unified certification system specifically for soil advisors. In the agricultural sector, advisors must be BASIS-certified to advise on agronomy, including nutrient management and plant protection products. The BSSS provides a Chartered Scientist in Soils[27] status through CPD, but this is not mandatory. The absence of a standardized certification process for soil-specific advice in non-agricultural sectors is seen as a gap, allowing individuals without sufficient expertise to provide potentially inaccurate advice.

4.7.3 Training Resources

Training resources available to soil advisors in the UK include:

- BASIS-accredited courses[28] such as Sustainable Land Management, Soil and Water Management, and Quality of Soils.
- British Society of Soil Science (BSSS) courses like Working with Soils and Agricultural Land Classification (ALC)[29].
- Online courses from international universities.
- Resources from Natural England, Welsh Government, and the Soil Association.
- Practical workshops, field days, and webinars from various organizations.

These resources cover a broad spectrum, from introductory courses to advanced soil management techniques.

4.7.4 Providers

- Training resources are provided by a variety of institutions:
- Universities, such as Lincoln University, offer BASIS-accredited courses.
- The British Society of Soil Science (BSSS) offers specialized soil science courses.
- Private organizations like Farmacy[30] provide internal training programs and online courses.
- Government bodies like Natural England[31] and the Welsh Government[32] offer guidance and resources.
- International universities and online platforms also contribute to the training landscape.

4.7.5 Funding

- Funding for the development and provision of training resources comes from multiple sources:
- Government funding, particularly for policy-applicable training.

---

[27] https://soils.org.uk/chartered-scientist/

[28] https://basis-classroom.co.uk/courses

[29] https://soils.org.uk/education/soil-training/

[30] https://farmacy.plc.uk/our-services/healthy-soils/

[31] https://publications.naturalengland.org.uk/category/23033

[32] https://www.gov.wales/soil-management

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

- Membership fees from organizations like BSSS.
- Commercial arrangements and candidate fees for courses.
- Industry funding, often through grower levies or specific projects by organizations like ADAS[33] and AHDB[34].
- Some private companies, such as Anglian Water, provide funding for farmers to undertake soil-related training[35].

Despite these diverse funding sources, there are concerns about the sustainability and consistency of funding for long-term training initiatives.

4.7.6 Challenges

Several challenges affect the provision and accessibility of training resources for soil advisors in the UK:

- Limited CPD-specific courses and accredited training options for soil advisors outside the agricultural sector.
- High costs and logistical difficulties associated with in-person training.
- Bias in factsheets and promotional materials, necessitating careful selection of trusted sources.
- The overwhelming amount of available online resources can be confusing and difficult to navigate for new users.
- Traditional agronomists may be reluctant to adopt new practices or training methods.
- Practical, hands-on training is essential but often challenging to organize and expensive.

4.7.7 Overall Evaluation

The training and information resources for soil advisors in the UK are varied and extensive but somewhat fragmented and inconsistent. Formal education and BASIS-accredited courses provide a strong foundation, complemented by practical field experience and CPD opportunities. However, the lack of a standardized certification system for soil advisors and the limited availability of accredited, sector-specific training pose significant challenges. Improving the provision and coordination of training resources, developing formal certification programs, and enhancing the promotion and accessibility of existing resources could significantly enhance the effectiveness and recognition of soil advisors in the UK. This would ensure that advisors are well-equipped with the necessary skills and knowledge to provide accurate and effective soil management advice across various sectors.

[33] https://adas.co.uk/

[34] https://ahdb.org.uk/knowledge-library/the-soil-health-scorecard

[35] https://www.anglianwater.co.uk/business/help-and-advice/working-with-farmers/our-projects/catchment-scale-soil-sampling/

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

4.8 Conclusion supply side evaluation

The training and information resources for soil advisors across the 7 NBSOIL countries are varied and generally robust, supported by strong educational and institutional frameworks. However, there is a widespread need for better coordination and centralization of information to improve accessibility and efficiency. Practical, hands-on training opportunities should be expanded to complement theoretical education. Addressing these challenges through more structured training programs, formal certification processes, and centralized information platforms could significantly enhance the effectiveness and recognition of soil advisors, ensuring they are well-equipped to support sustainable soil management practices across Europe.

Soil advisors across the NBSOIL countries generally gain expertise through a mix of formal education and practical experience. Universities provide foundational knowledge, but hands-on fieldwork and on-the-job training are crucial for developing practical skills. Continuous professional development also plays a significant roles, as well as peer-to-peer learning, especially in the Mediterranean countries.

Most countries do not have standardized certification process specifically for soil advisors. While there are certifications for related roles, such as agronomists, the absence of formal certification for soil-specific advice is sometimes evaluated critically by the interviewed experts who mention issues in the quality and reliability of advisory services.

Training resources vary widely in quality and accessibility. Universities, professional associations, and online platforms offer a range of educational programs, but practical, hands-on training is often limited. This gap is significant because practical skills are essential for effective soil management.

A diverse array of institutions provides training resources, including universities, research institutes, governmental bodies, NGOs, and private organizations. However, the lack of coordination among these providers can lead to fragmentation and redundancy in available resources.

Common challenges include limited centralized information, insufficient practical training opportunities, and varying levels of resource accessibility and awareness. These issues hinder the ability of soil advisors to access comprehensive and relevant training, ultimately affecting the quality of soil management advice.

While the NBSOIL countries offer a broad spectrum of training and information resources for soil advisors, many interviewees hinted to us that the offer in their country is fragmented and lacks coordination. To improve the situation, there is a need for more structured training programs. Formal certification processes, and centralized information platforms could help, although this is unlikely to solve all issues.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

5 Assessment of the demand for information and training resources by soil advisors

5.1 Justification for the technical deviation

The methodology for the demand side assessment was modified after debriefing the process and results from the supply side interviews. We discussed this first with the work package coordination and informed the consortium coordination and WP leaders about the proposed change on 24.01.2024 per e-mail. As there were no objections from the project coordination and WP leaders (EB - Executive Board) to the adjusted methodology, we proceeded with it. We considered this to be a minor technical deviation that would enable to have a broader respondent base for the supply side assessment, which was also a view of the EB.

It occurred that the conduct of a relatively large number of qualitative interviews (15-20) and a relatively small N survey ("distributed to at least 50 practitioners in each country", based on the task description in the grant agreement) in a bounded population (soil advisors interested in training in the NBSOIL partner countries) would lead to quite some overlap in terms of individuals addressed, likely to cause in terms of results. If we ran already 15-20 qualitative interviews per country it beforehand, it was likely that the survey as planned in the grant agreement wouldn't return new information.

Distributing the survey to 50 practitioners/country would likely result in an even lower number of response than the planned interviews (the standard response rate is of approx. 20% for this type of survey, and it is likely that we would have been below) and with less depth.

We discussed the option of running only the qualitative interviews as planned and drop the survey. We rejected this option, as we already gathered some qualitative information on the demand side in the previous interview round with training suppliers. This information was also supplemented by partners' expertise and the literature. Since for the demand side we wanted to obtain a broader view of the needs and expectations of practitioners looking for training, we decided to transfer efforts from the qualitative interviews to the survey. We also decided to have a broader approach and target soil advisors in whole Europe, as the NBSOIL academy is not bounded to specific countries.

We proposed to proceed as follow:

- Partners conduct 3-5 exploratory interviews with (aspiring) soil practitioners to assess general expectations/needs towards training. This information will support the survey development and enable us to formulate questions relevant at the European level.
- Instead of distributing the survey to at least 50 practitioners per NBSOIL partner country, we targeted responses from 400 respondents for the survey. This required to spread the survey more broadly in each country and at European level, as well as more follow up in the implementation phase. We considered that this would give us a more accurate view of the overall demand at European level.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

5.2 Exploratory interviews and survey preparation

Partners have conducted 3 to 5 exploratory interviews with soil practitioners to assess general expectations and needs regarding training (table. This information supported the development of the survey and ensured the questions were relevant across all countries. The demand side survey mainly targeted soil advisors or aspiring soil advisors looking for training resources. We conducted 18 exploratory qualitative interviews in the different NBSOIL country to identify issues and items that actors considered important to be addressed in the survey. The interviews especially enabled us to identify the right categories and wording to cover all potential education sources for soil advisors in the different countries. Another important addition was to expand the list of nature-based solutions to be considered in the survey.

Stakeholder type	Number
Agricultural advisor	12
Farmer	1
Forestry advisors	3
Environmental consultant	1
Student	1
Total	18

Table 2. Actors interviewed to prepare the demand side survey.

The survey was administrated on Limesurvey[36] from May to September 2024. It was spread through discussion lists, Whatsapp groups and social media by the NBSOIL partners in their respective country. All advisors based or exerting their professional activity in Europe could respond to the survey.

The survey consisted of 28 questions to be completed in approximately 10 minutes.

5.3 Analysis of the demand side survey

5.3.1 Respondent characterization.

The survey was filled by 374 respondents, with 79 respondents not corresponding to the target population (that is not identifying as a soil advisor, or aspiring soil advisor, or not based or exerting their activity in Europe).

[36] https://survey.fibl.org/index.php/admin/survey/sa/view/surveyid/772913 All data is stored at FiBL in GDPR compliant way and can be made available upon request. Responses are anonymous and cannot be tracked back to individuals. No IP address or other electronic identifier was recorded.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

From the remaining 295 survey, 165 were completely filled. We used these for the more detailed analysis of complex questions with multiple choices and multiple entries (for instance question 18-20 and 22-23).

The gender composition of the survey 51.22% female, 48.17% male and 0.61% not identifying with these genders. In terms of age the breakdown was: 29.88% aged 45-54; 23.17% aged 25-34; 21.95% aged 35-44; 18.90% aged 55-64; 4.27% were 65 and over and 1.22% aged 18-24.

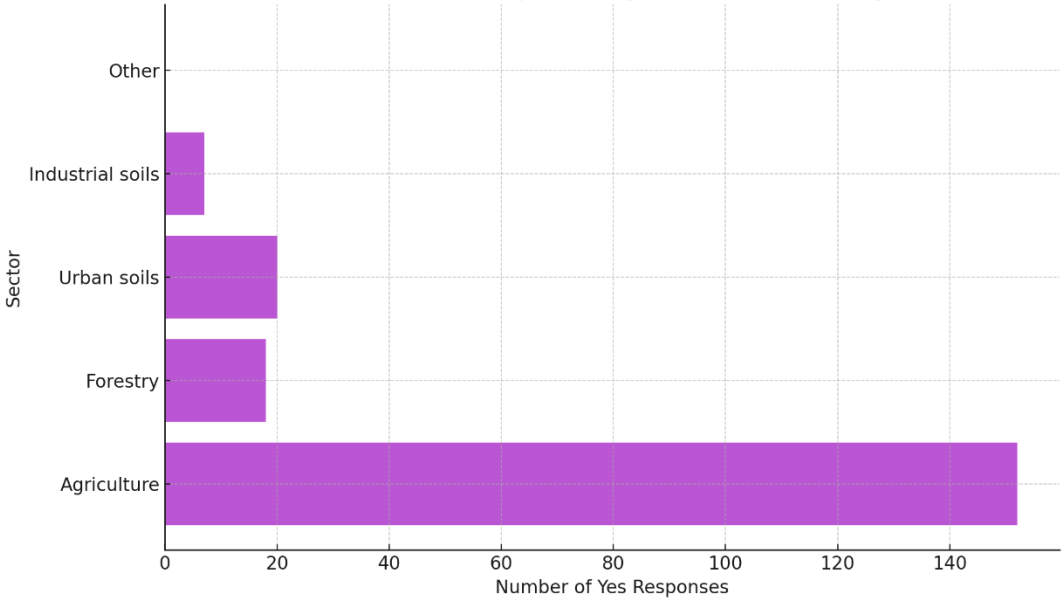
In terms of highest reached educational degree, 71% of respondents declared having a masters degree, an equivalent degree or a higher degree from a University. 19% declared to have a bachelor degree or equivalent. And 4.5% declared having a high school degree. Less than 2% declared having a vocational degree. It is important to note that this level of education does not necessarily reflect the respondents' educational level on soil advice which we assessed differently.

5.3.2 Scope of soil advice activities

This section groups the questions that dealt with the scope of the soil advice activities of the respondents, that is in which sectors and under which conditions and to whom they provide soil advice.

A majority of the respondents (152) provide soil advice in the agricultural sector, followed by urban soil (20), forestry (18) and industrial soil (9) (Fig. 3). Most respondents providing soil advice in another sector than agriculture, provide advice to more than one sector.

Table 3. Responses to the question "In which sector(s) do you provide soil advice?"



Accordingly, the individuals or organizations to whom the respondents provide soil advice reflect the structure of the sectors (fig.4). This is a first indication of the broad numbers of actors soils advisors have to engage with. Training offers for soil advisors should take this diversity into account.

Table 4. Responses to the question To whom do you provide soil advice?

Co-funded by the European Union

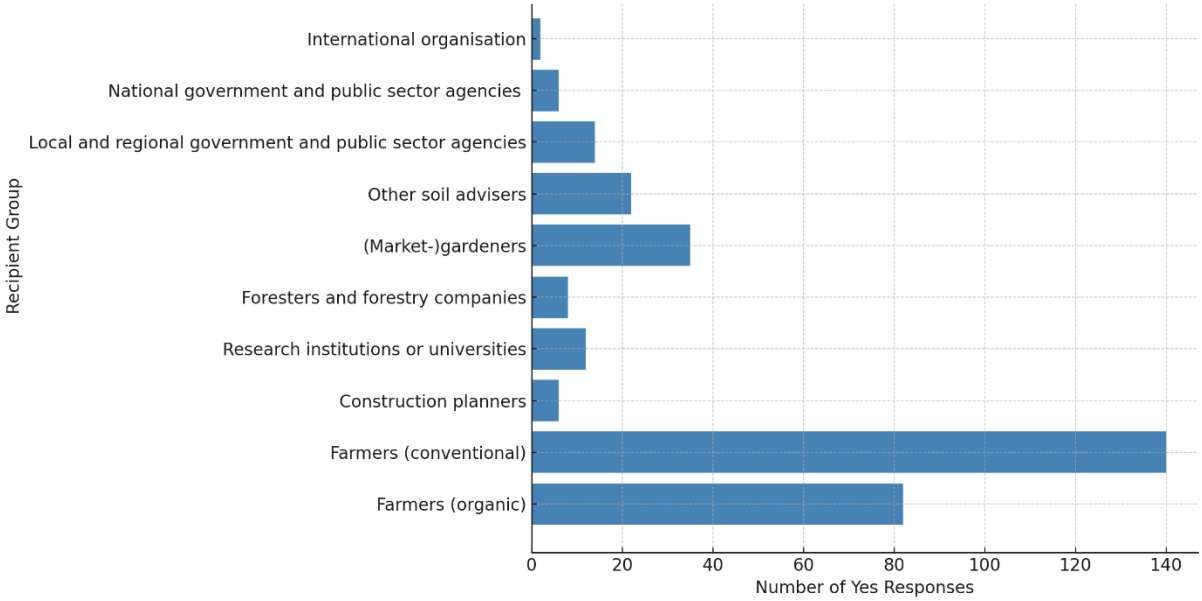
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

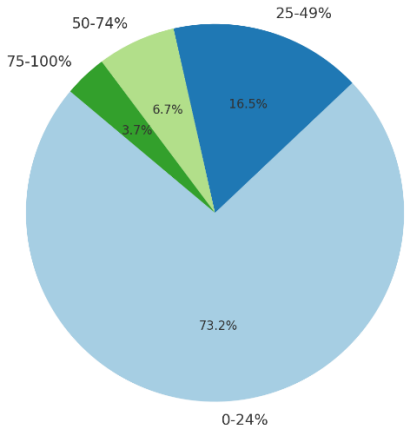
Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).



It is important to note that for most respondents providing soil advice is only a part of their professional activity. For almost 90% of the respondents, soil advice represents less than 50% of their worktime (fig. 5). This can be explained because most soil advisors are also general agricultural, agronomic or environmental advisors. This was also reflected in the question “How do you name your main occupation /primary profession?” where most respondents provided as answer a variation of agricultural or agronomic advisor in their own language.

Table 5. Response to the question What share of your professional activity does soil advice represent?



5.3.3 Training to become a soil advisor

When asked about what training they took to become a soil advisor, respondents chose a broad range of options (see fig. 1).

Table 6. Responses to the question “What training/education did you receive to become a soil advisor?”

Co-funded by the European Union

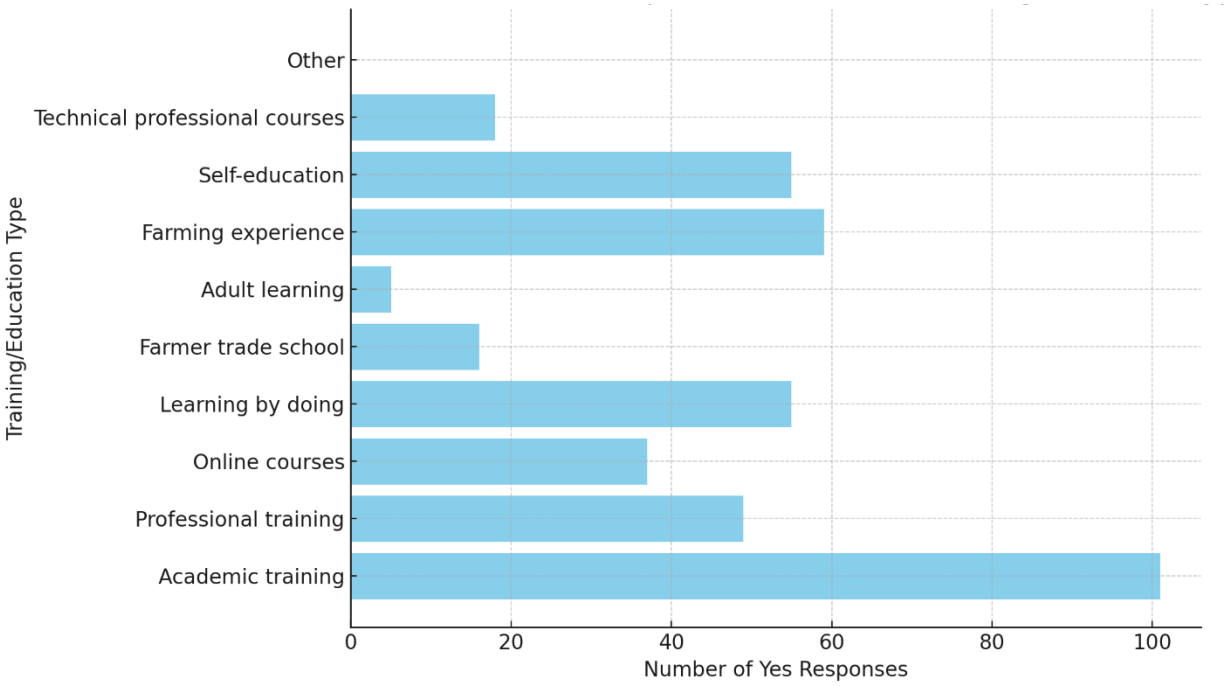
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government’s Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).



While formal academic training is still a privileged route (101 respondents), less formal ways of acquiring knowledge and experience such as learning by doing (52), farming experience (59) or self-education (53) are also mentioned. Though it is worth noting that these categories are often mentioned alongside academic training or other types of technical or professional training. Overall, respondents are moderately to well satisfied with how their training prepared them to become a soil advisor (fig. 2). This can be taken as an indication that there might be a demand for further advanced or targeted training offer on soil advice.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

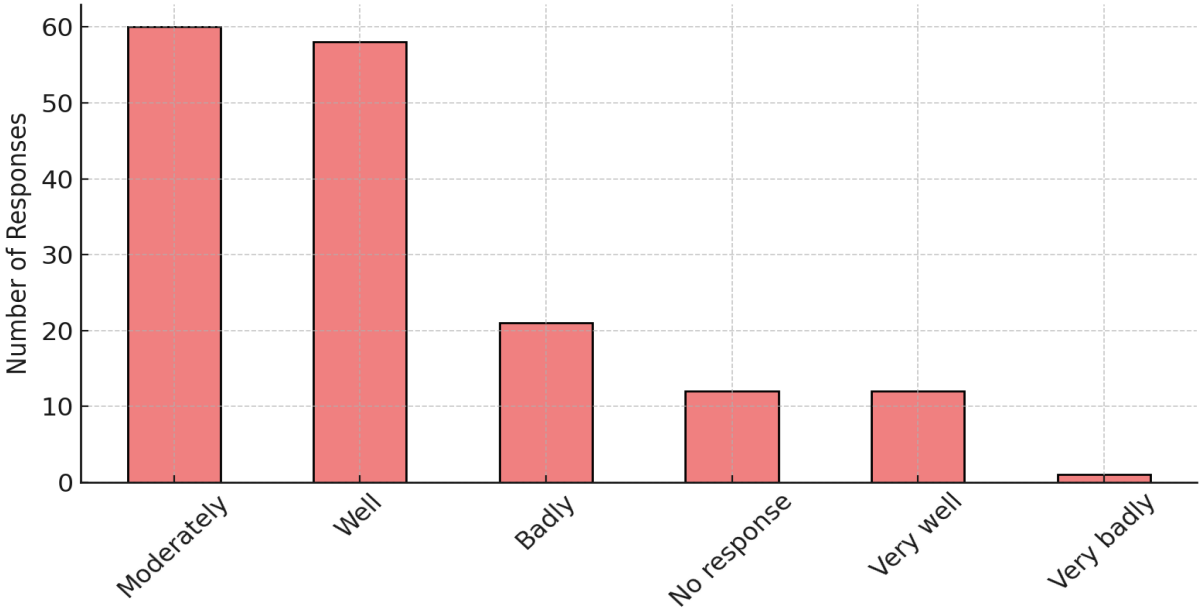
UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

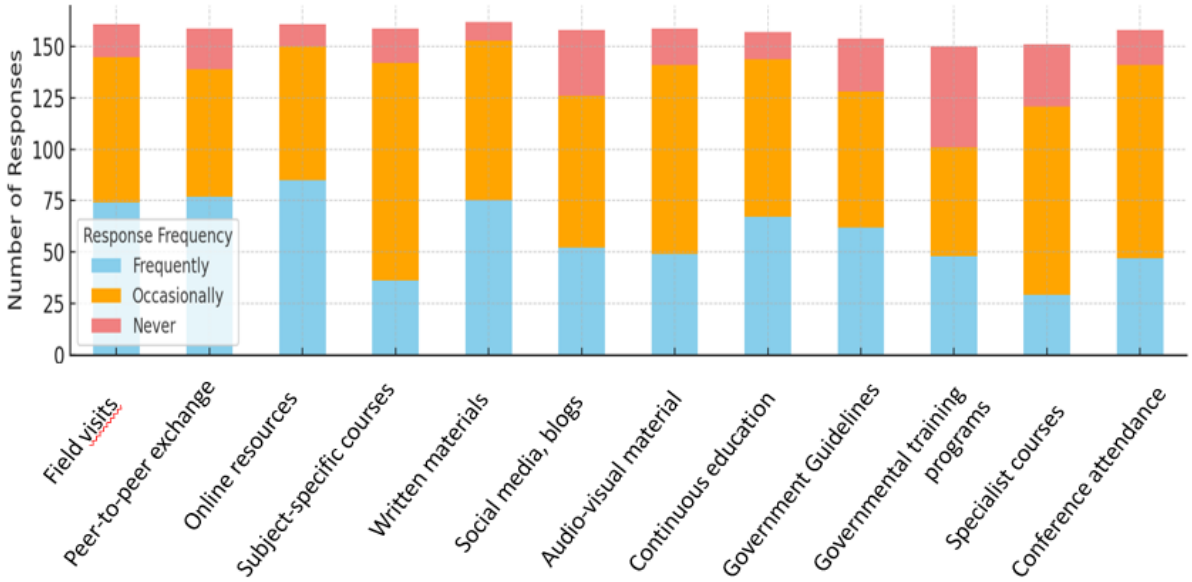
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Table 7. How well did this training/education prepare you to become a soil advisor?



When asked whether they have a certification to provide soil advice, 81.7% of the respondents reply negatively. 10.4% reply they have a certification and 4.5% reply they have another certification covering their soil advice activities.

Table 8. Response to the question How frequently do you acquire knowledge useful to your professional activity from the following knowledge resources?



Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

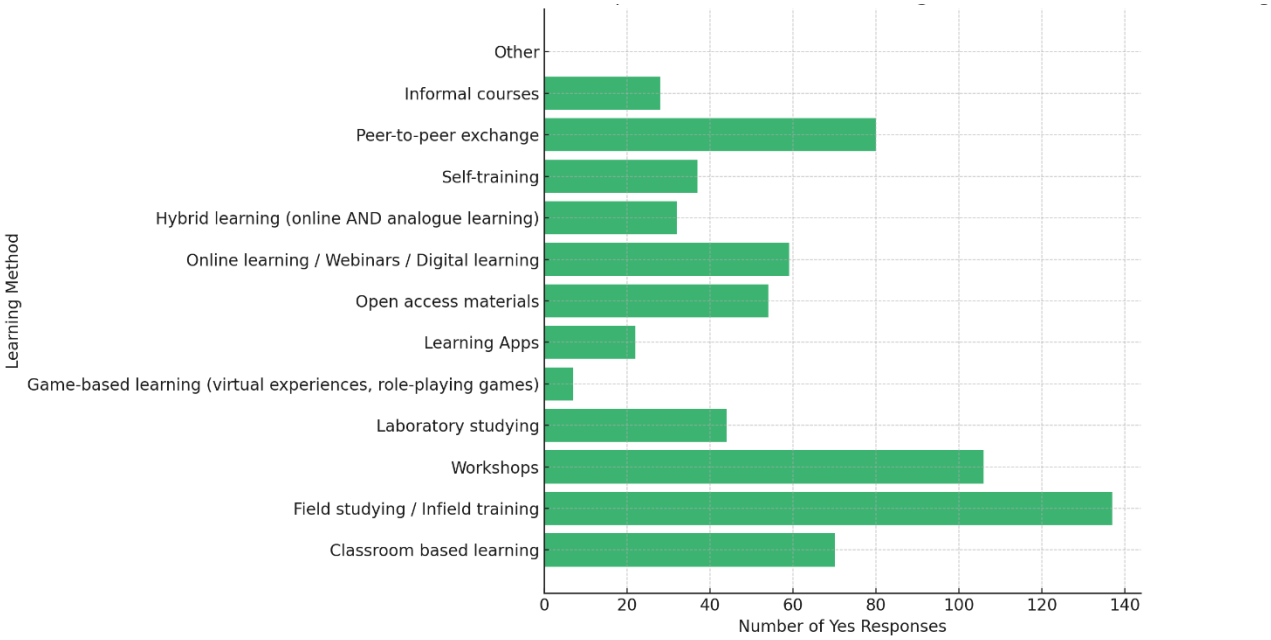
Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Besides their initial training in soil advice, most respondents indicate to deepen and expand their knowledge by frequently or occasionally using knowledge resources on soil advice (Fig. 6). Among those, online resources are the most frequently used type of resources, followed by peer-to-peer exchange (either in the form of individual exchange or in the form of community of practices).

When asked which are the most effective learning methods for themselves, respondents predominantly name methods which require physical presence (Fig. 7). The most frequently named methods were on field training (138), workshops (107), peer-to-peer exchange (80) and classroom-based learning (69).

Table 9. Responses to the question When considering training and courses related to soil and soil advice, which learning methods do you find most effective?



5.3.4 Soil advice and NBS

When asked about the concepts of soil health or nature-based solutions, a large share of participants declared having encountered at least one of them as part of their professional activities related to soil advice (fig. 8).

About 30% of the participants declared using only the term soil health as part of their professional activities. 7% use only the term nature-based solutions, without referring to soil health. And 47% declared encountering or making use of both terms in their professional activities.

Close to 16% declared having encountered none of those concepts.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

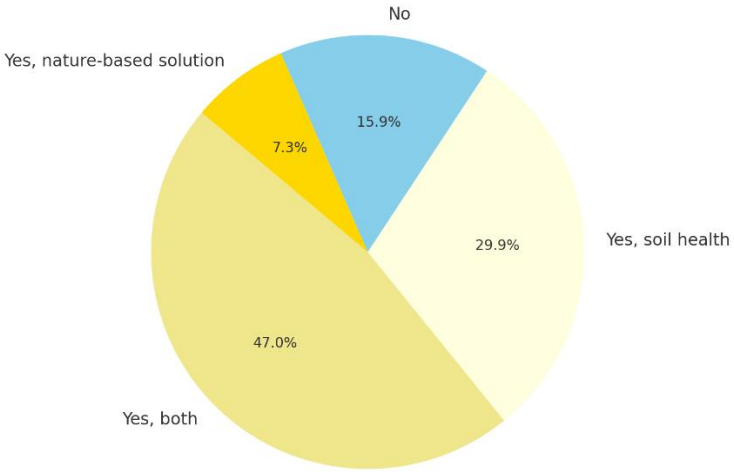
UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

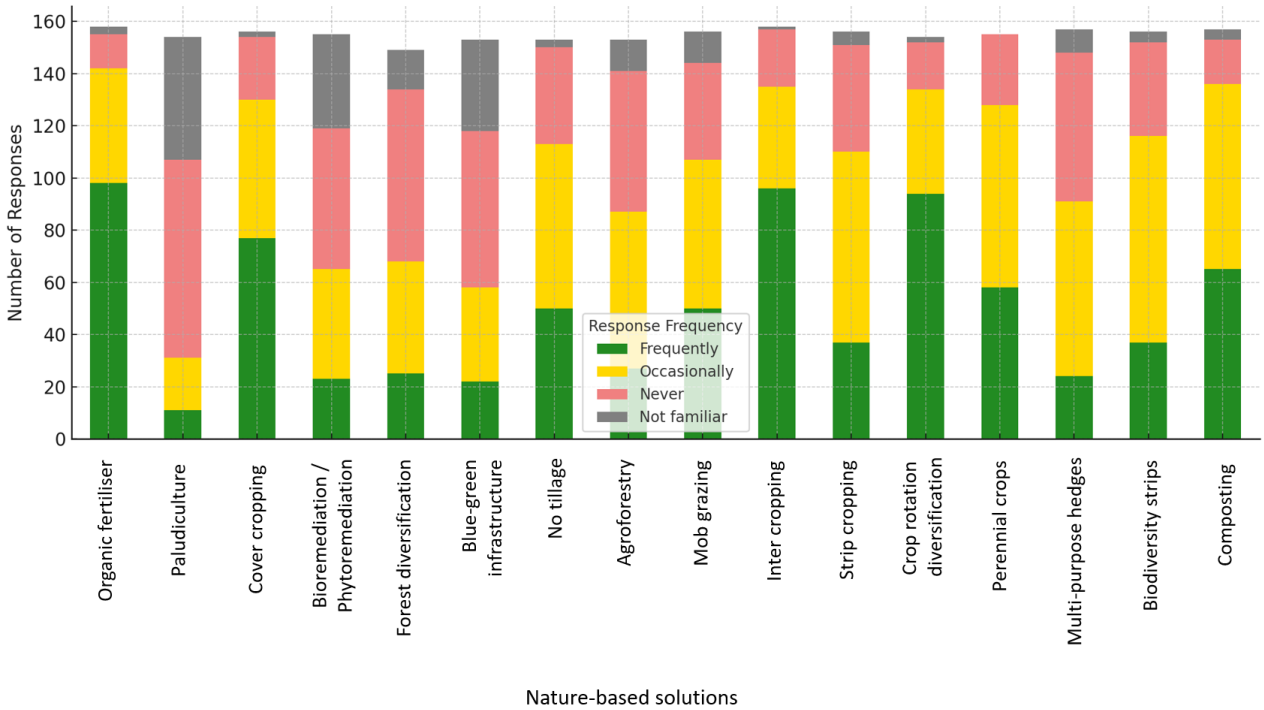
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Table 10. Responses to the question As part of your soil advice professional activity, do you encounter or make use of the concept of soil health and/or nature-based solutions?



The nature-based solutions that the respondents provide most frequently advice on are the ones already well established in organic, agroecological and regenerative farming practices (Fig. 9). Organic fertilisers inter cropping, crop rotatation, cover cropping and composting all have more than 130 mentions. Though composting is only cited as being advised occasionally by many who cited the methods.

Table 11. Response to the question As a soil advisor, how frequently do you provide advice on the following nature-based solutions?



Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

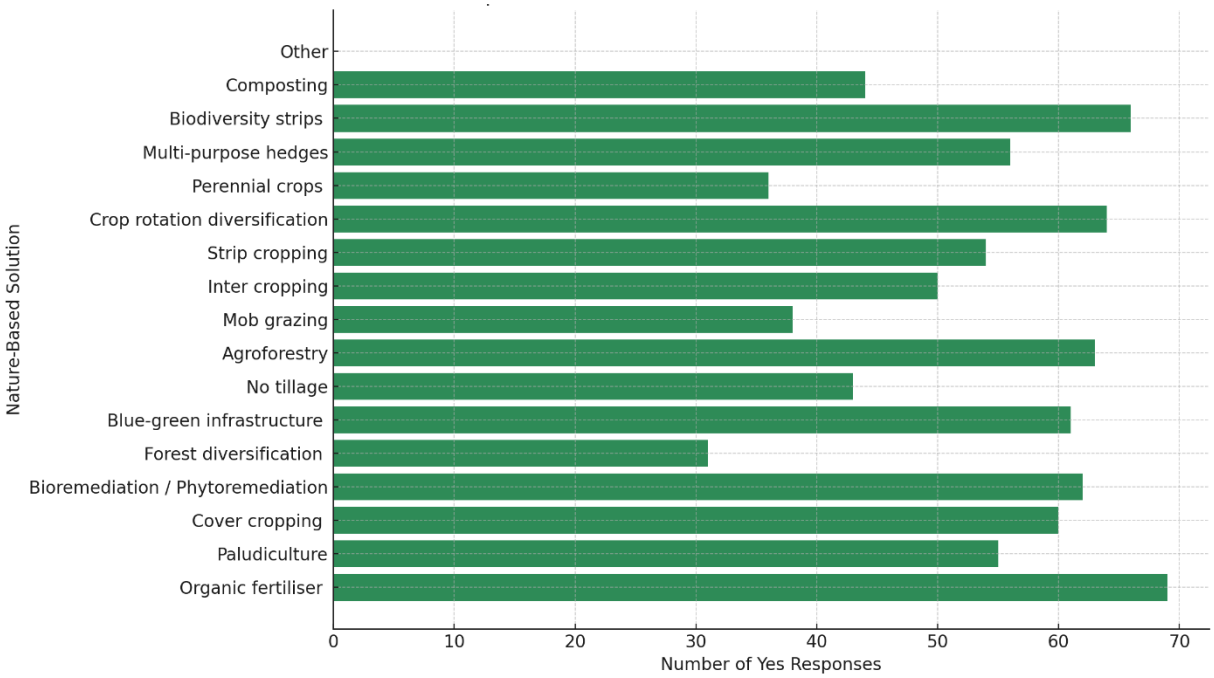
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Paludiculture, bioremediation and blue-green infrastructure are the nature-based solutions that the respondents most often cite as not being familiar with. Correspondingly these are also the methods less often advised by the respondents to the survey. This might be because bioremediation and blue-green infrastructure are mostly used in non-agricultural settings and because paludiculture is currently mainly implement in North and Central European countries and is still an emerging practice.

When asked about which nature-based solutions soil advisors would like to have more information about, organic fertilisers and biodiversity strips are the most often cited (Fig. 10). It is interesting to note that bioremediation and blue-green infrastructure which were among the methods respondents indicated to be less familiar with are also among the methods most respondents want to have more information or training about.

Generally respondents are interested in receiving more information/training about a wide range of nature-based solutions. Only composting, no tillage, mob grazing, perennial crops and forest diversification were mentioned less than 50 times.

Table 12. Responses to the question Which nature-based solutions would you like to have additional information, knowledge resources or training on?



Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

6 The NBSOIL interactive map of knowledge resources for soil advisors

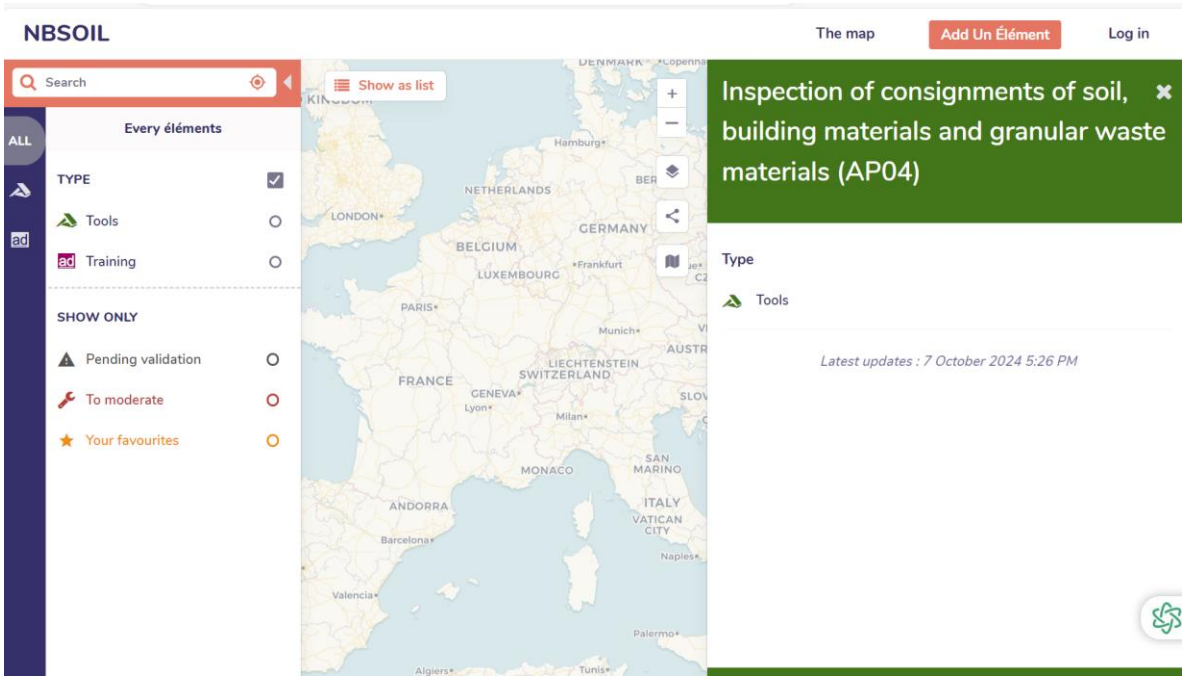
Based on the resources identified in the supply side assessment in chapter 4 of this document as well as in Deliverable 3.2. Roadmap for effective upskilling of soil health advisory services – identifying existing resources, we developed an interactive map to address the demand for training resources in soil advice.

The map was developed using the GoGoCarto platform[37]. The platform is freely available and open source. It enables user to create map with different tags and to filter according to the data structure.

The NBSOIL interactive map of knowledge resources for soil advisors can be accessed under following link:

https://nbsoil.gogocarto.fr/map#/carte/@46.16,-6.24,4z?cat=all

After an initial public testing phase it will be fully embedded in the NBSOIL website.



The resources in the interactive map are organised in 4 categories identified by different icons:

[37] https://gogocarto.fr/

Co-funded by the European Union
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation
This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

- Training and education: this category groups offer for courses either in presence or online, offered by organisations ranging from universities, to chambers of agricultures, to private course providers;
- Tools and apps: this category lists tools such as smartphone or computer applications but also physical tools that can support soil advisors in their activities
- Social media: this category lists platforms where soil advisors can exchange with peers, find first hand testimonies or blogposts that can support them in their activities
- Written material: this category groups all kind of documentation (reports, websites, e-books…) in text form that provide information relevant for soil advisors.

Further, the resources can be filtered according following criteria:

- Country
- Language
- Type of access (in presence, online, hybrid)
- Costs (Paid, Free, Free with paid extra services)

Each entry provides the name of the resource, the authoring/editing organisation, the country, language, type of access and cost, as well as a short summary and a link to the resource on the web.

Entries can be added by anyone registering in GoGoCarto. During the duration of the project, additional entries will be regularly curated by FiBL.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

7 Conclusion

This deliverable presents an assessment of the supply of knowledge resources for soil advisor as well as a of the demand and needs of soil advisors for further training.

There is a large offer of resources for soil advisors across Europe, but information about it remains fragmented. This is due in large part to accessibility issues for resources that require physical presence, as well as some language barriers. Online resources could help here, especially multilingual ones.

Although soil advisors seem generally satisfied with the initial training they received, there is a strong demand for further training and knowledge resources. The demand for more information on nature-based solutions to improve soil health was very clear in the survey.

By compiling and organising a wide range of information the NBSOIL interactive map of knowledge resources for soil advisors will partly address this demand.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Appendix I: Reporting for with interview guideline for the supply side assessment

NBSOIL
Nature-Based Solutions
for Soil Management

Task 3.1.: Supply side interviews

Interview Guideline

19.07.2023

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Informed consent

We are inviting you to participate in a study aimed at understanding how farmers and land managers implement nature-based solutions. believe that you can provide valuable information for our research. Before agreeing to participate in the study, it is important that you read and understand the procedures involved.

This study is part of the Horizon Europe project NBSOIL (Nature-based Solutions for Soil Management), a four-year EU funded project that aims to create and test a learning pathway for existing and aspiring soil advisors. The project is coordinated by the Institute of Soil Science and Plant Cultivation in Pulawy, Poland. More information about the project can be found at https://nbsoil.eu/

As part of the NBSOIL project, we are assessing the availability of training resources in partner countries. We would like to conduct an interview with you that will last about 45 minutes. We will ask you questions about how soil advisors are trained in your country, how they acquire their expertise, how this expertise is recognized, and how you evaluate current resources for gaining expertise in soil advice.

The interview will be recorded for verification purposes. If you prefer not to be recorded, you can participate in the study by returning a signed version of this informed consent sheet.

The content of the interview will be used only for the purposes of the NBSOIL project, which includes internal project work and subsequent publications. Anonymized transcripts of the interviews will be stored for 10 years by the Swiss project partner FiBL on secured internal servers. The recording of the interviews will be stored until the analysis is completed and verified, but no longer than the duration of the project.

Your information will be treated confidentially in a GDPR compliant way. Your personal data and the interview content will be stored separately. No personal data will be shared with anyone external to the NBSOIL project. When content of the interview is used in publications or reporting, it will be reported anonymously.

You will need to sign this form or provide your consent on recording to give us your permission to be involved in the study. Your participation is entirely voluntary, and you can withdraw at any time without giving a reason.

In case you have any question, you can contact one of the persons below

Contact:

Name, organization and e-mail address of the person supervising or conducting the interview.

or

Name, organization and e-mail address contact person and data protection officer Research Institute of Organic Agriculture (FiBL), Frick, Switzerland

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Definitions:

Soil advisors: In the frame of this interview, soil advisors are people who are offering advice on the appropriate management of soil professionally or aiming to. They provide soil advice in the agricultural sector, in forestry or in urban and industrial settings.

Training resources: In the frame of this interview, training resources refers to all the resources that professional or aspiring soil advisors use to build up their expertise. These resources include courses (formal education, workshops, online courses, MOOCs), written materials (factsheets, handbooks, magazines, social media posts, blogs), audio-visual materials (videos, YouTube channels…), or specific programs (mentoring programs, peer groups…).

Before starting with the

Information about the interview	
Date of interview	
Location	
Interview duration	
Name of the organisation of the interviewee	
Position of the interviewee	
Years of experience in soil related activities	

Responses to the questions	
1	How do soil advisors acquire their expertise in your country? *Prompt: Are there other ways?*
	Interviewee's response
2	Who are soil advisors in your country? Are they usually specialized on soil advice in a specific sector (agriculture, forestry, industrial and urban soil)?

Co-funded by the European Union
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation
This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI
This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

	Interviewee's response
3	Do soil advisors need to be certified in your country? *Prompt: If yes, what type of certification? Is it specific to soil advice? Who delivers it? What is the duration of the course to become a certified soil advisor? If no, is it an issue?*
	Interviewee's response
4	Which current learning/training resources for soil advisors are you familiar with? Can you name those that come to your mind? Please indicate which type of resources those are *Prompt: (If relevant): Are there other resources than those leading to a certification?*
	Interviewee's response
5	Who provides these training resources? *Prompt: what type of organisation is it?*
	Interviewee's response
6	How and by whom is the development and provision of these funded?
	Interviewee's response
7	How are these resources made accessible to soil advisors and other interested stakeholders? *Prompt: What are the requirements to enrol? Is it open to all? In what format?*
	Interviewee's response
8	Who enrols in this training or makes use of these resources? *Prompt: is it the targeted audience, who else would the developers of the resource like to enrol?*
	Interviewee's response

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

9	Are there any challenges with access to these resources? *Prompt: Such technical barrier? Lack of awareness of their existence? Inadequate format? Bad timing?*
	Interviewee's response
10	Have you specifically been involved in the funding, development, or provision of knowledge resources? If so, what was your role?
	Interviewee's response
11	What is the main use and benefit of these resources? *Prompt: What method or what information contained within this course/training is especially appreciated? Is there any evidence that the course training content is actually used*?
	Interviewee's response
12	Generally, how do you evaluate the provision of training and information resources to soil advisors in your country? *Prompt: Are there any gaps remaining with regard to training soil advisors?*
	Interviewee's response
13	Is there any other aspects of the training of and information to soil advisors that we did not address in this interview?
	Interviewee's response

Do not forget to thank the interviewee before ending the interview. You can ask if they want a follow up.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Appendix:II Demand side survey

Survey on training needs and expectations of soil advisors

We invite you to participate in a survey designed to explore and understand the training needs and expectations of professionals who provide advice on soil in the sectors of agriculture, forestry, industrial and urban soils (thereafter “soil advisors”). We also encourage those aspiring to become soil advisors to fill in the survey.

Link to the survey:

Completing this online survey will take approximately 10 minutes. Responses will be collected anonymously. Before starting the survey, you will receive more information on data protection, storage and privacy policy.

The survey is conducted by the Research Institute of Organic Agriculture (FiBL) located in Frick Switzerland. This study is part of Horizon Europe project NBSOIL, a four-year EU co-funded project that aims to develop a learning pathway for existing and aspiring soil advisors. More information: https://nbsoil.eu/

We thank you in advance for your participation. Your responses ensure that the views of practitioners are considered in the development of new training resources on soil advice.

Sincerely.

Survey on training needs and expectations of soil advisors

Welcome to this survey, please select a language.

Welcome message

Welcome to our online survey focussing on soil advisory services.

We invite you to participate in a study designed to explore and understand the training needs and expectations of soil advisors. We also encourage those aspiring to become soil advisors to participate. Your input makes sure that the views of practitioners are considered in the development of new training resources on soil advice.

This study is part of Horizon Europe project NBSOIL (Nature Based Solutions for Soil Management), a four-year EU funded project that aims to create and test a learning pathway for existing and aspiring soil advisors The project is co-funded by the European Union, UK Research and Innovation and the Swiss State Secretariat for Education Research and Innovation. More information about the project can be found at https://nbsoil.eu/.

Completing this online survey will take approximately 10 minutes.

The survey is conducted by the Research Institute of Organic Agriculture (FiBL) a participating organisation in NBSOIL project.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government’s Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Please note that your responses will be collected anonymously, ensuring it is not possible to link them back to you personally. Data is stored on FiBL servers in Switzerland.

Participation in this survey is entirely voluntary. Should you have any questions about data protection or wish to withdraw your consent, please contact dataprotection@fibl.org at any time. In the event of withdrawal, FiBL will promptly delete your related data and your participation in this survey will cease. If you have any complaints, you have the right to contact the relevant supervisory authority at any time.

For further information see: FiBL Statistics - Privacy Policy

Should you have any questions or comments regarding this survey, please don't hesitate to contact us at:

Olivier Ejderyan, Research Institute of Organic Agriculture (FiBL), Frick, Switzerland:
olivier.ejderyan@fibl.org

Survey Questions

Are you a soil advisor based in Europe?

1 Question: **A1 Mandatory** Do you provide, or aspire to provide soil advice, as part of your professional activity?

Help text: Definition **soil advisors**: In the context of this survey, soil advisors are those offering advice on soil health and the appropriate management of soil, as part of their professional activities, or aiming to do so. They provide soil advice in the agricultural, forestry, or urban and industrial sectors, or in other settings. It does not refer to a specific job title or function, nor does it suppose that people define themselves as a soil advisor.

If you are an **aspiring soil advisor**, please answer the questions based on the training/education you are currently pursuing and on the sector in which you want to provide advice in future.

Answers (single choice):

- Yes
- Yes, I aspire to provide soil advice as part of my professional activity
- No

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

2	**A2 Mandatory** In which country are you professionally based (in case of self-employment where are you registered)? *Help text:* If the country you work in is not listed here, we cannot include your responses in this survey. You can exit this survey - thank you!
	• List of European Countries (drop down) (single choice) • My country is not listed above
	Your training as a soil advisor **Your experience as soil advisor**
3	**B1** What training/education did you receive to become a soil advisor?
	Answers (multiple choice): • Academic training • Professional training • Online courses • Learning by doing • Farmer trade school • Adult learning • Farming experience • Self-education • Technical professional courses • Other: [ENTRY FIELD] • Prefer not to answer
4	**B2** How well did this training/education prepare you to become a soil advisor?
	Answer (single choice): • Very well • Well • Ok • Badly • Very badly
5	**B3** What type of organisation provided your training/education?
	Answer (multiple choice): • A public university • A private university

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

- A private company/agency
- An association
- A professional body
- Regional agencies/authorities
- A non-governmental (research-) organisation
- A non-profit organisation
- A governmental (research) institution
- A private agriculture consulting firm
- Technical schools for soil advisors and land managers
- Other: [ENTRY FIELD]

6 **B4** Do you have a certification for providing soil advice?

Answer (single choice):

- Yes
- No

7 **B5** In which sector(s) do you provide soil advice?

Answer (multiple choice):

- Agriculture
- Forestry
- Urban soils
- Industrial soils
- Other: [ENTRY FIELD]

8 **B6** To whom do you provide soil advice?

Help text: If your answers are not listed below, please add them into the 'other' entry field.

Answer (multiple choice):

- Farmers (organic)
- Farmers (conventional)
- Construction planners
- Research institutions or universities
- Foresters and forestry companies
- (Market-)gardeners
- Other soil advisers
- Local and regional government and public sector agencies
- National government and public sector agencies
- International organisation
- Other: [ENTRY FIELD]

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

9	**B7** In what typical work setting do you offer soil advice? Help text: If your answers are not listed below, please add them into the 'other' entry field.

Answer (multiple choice):

- Self-employment
- A private company
- Agricultural consulting firm
- Environmental consulting firm
- A public authority
- A research centre or a university
- A forestry company
- Other: [ENTRY FIELD]

10	**B8** What share of your professional activity does soil advice represent?

Answer (single choice):

- 0-24%
- 25-49%
- 50-74%
- 75-100%

11	**B9** How many years are you or have you been working as a soil advisor?

- Still in training
- Less than two years
- 2 - 5 years
- 6 -10 years
- More than 10 years

12	**B10** Where do you usually work as a soil advisor?

Answer (multiple choice):

- Office / Indoors
- In the fields / Outside
- In a laboratory
- Classroom / Educational institute
- Other: [ENTRY FIELD]

13	**B11** At what regional scales do you provide soil advice?

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

	Answer (multiple choice): • Locally • Regionally • Nationally • Internationally
	Existing resources for soil advisors
14	**C1** How frequently do you acquire knowledge useful to your professional activity from the following knowledge resources?
	• Field visits (being in-situ) • Peer-to-peer exchange (community of practice) • Online resources • Subject-specific courses • Written materials (books, factsheets, magazines…) • Social media, posts, blogs • Audio-visual materials (videos, YouTube channels…) • Continuous education / continuous professional development • Government Guidelines • Governmental training programs • Specialist courses • Attendance at conferences EACH OF THE ABOVE WILL BE ASSESSED BY PARTICIPANTS BY THE FOLLOWING: • Frequently • Occasionally • Never
15	**C2** Generally, how do you evaluate the offer of training and information resources to soil advisors in your country?
	• There is a lot of useful and accessible information out there. • There is some useful and accessible information out there. • There is a moderate amount of useful and accessible information out there. • There is little useful and accessible information out there. • There is very little useful and accessible information out there.
16	**C3** Are there specific training needs you have that existing programs or resources do not yet meet?
	Answer (single choice): • Yes

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

- No

17 **C4 If yes,** please specify what kind of training should be available:

- [ENTRY FIELD]

18 **C5** When considering training and courses related to soil and soil advice, which learning methods do you find most effective?

Help text: Please select all methods that you personally consider helpful for courses on soil (advising).

Answer (multiple choice):

- Classroom based learning
- Field studying / Infield training
- Workshops
- Laboratory studying
- Game-based learning (virtual experiences, role-playing games)
- Learning Apps
- Open access materials
- Online learning / Webinars / Digital learning
- Hybrid learning (online AND analogue learning)
- Self-training
- Peer-to-peer exchange
- Informal courses

19 **C6** Which of the following knowledge resources would you like to have more access to?

Help text: Please mark all applicable answers. If you want to add different knowledge resources, please use the “other” entry field.

- Peer-to-peer exchange (community of practice)
- Academic training (i.e. university courses)
- Online resources
- Written materials (factsheets, magazines…)
- Social media, posts, blogs
- Audio-visual materials (Videos, YouTube channels…)
- Governmental training programs
- Government Guidelines
- Training on communication skills
- Training on facilitation skills
- Continuous education / continuous professional development
- Other: [ENTRY FIELD]

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government’s Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

20 **C7** How do you stay informed about new training, courses and knowledge resources relating to soil and soil advice?

Answer (multiple choice):

- Newsletters
- Social Media (Whatsapp, Facebook, Linked-In…)
- Advertised at specific events
- Trade shows
- In-person events (not online)
- Video streaming platforms (YouTube, daily motion…)
- From peers /colleagues
- Internet research
- Other: [ENTRY FIELD]

Nature-based solutions in your activity as soil advisor

21 **D1** As part of your soil advice professional activity, do you encounter or make use of the concept of soil health and/or nature-based solutions?

Help text: The International Union for Conservation of Nature (IUCN) defines nature-based solutions as actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.

Answer (single choice):

- Yes, both
- Yes, soil health
- Yes, nature-based solution
- No

22 **D2** As a soil advisor, how frequently do you provide advice on the following nature-based solutions?

Help text: If there is a nature-based solution you are not at all familiar with, please select “I am not familiar with this method”.

Answer (multiple choice):

- Organic fertiliser
- Paludiculture
- Cover cropping
- Bioremediation / Phytoremediation
- Forest diversification
- Blue-green infrastructure
- No tillage

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government’s Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

- Agroforestry
- Mob grazing
- Inter cropping
- Strip cropping
- Crop rotation diversification
- Perennial crops
- Multi-purpose hedges
- Biodiversity strips
- Composting
- Other: [ENTRY FIELD]

EACH OF THE ABOVE WILL BE ASSESSED BY PARTICIPANTS BY THE FOLLOWING:

- Frequently
- Occasionally
- Never
- I am not familiar with this method

23 **D3** Which nature-based solutions would you like to have additional information, knowledge resources or training on?

Answer (multiple choice):

- Organic fertiliser
- Paludiculture
- Cover cropping
- Bioremediation / Phytoremediation
- Forest diversification
- Blue-green infrastructure
- No tillage
- Agroforestry
- Mob grazing
- Inter cropping
- Strip cropping
- Crop rotation diversification
- Perennial crops
- Multi-purpose hedges
- Biodiversity strips
- Composting
- Other: [ENTRY FIELD]

Information about your background

24 **E1** To which gender do you attribute yourself?

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

- Male
- Female
- Other: [ENTRY FIELD]

25 **E2** What is your age?

Answer (single choice):

- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 and over

26 **E3** What is your current level of education?

Answer (single choice):

- No degree
- Vocational certificate or apprenticeship with certificate of proficiency
- Basic vocational training / vocational baccalaureate
- High school diploma
- Bachelor's degree from a college / university
- Master's degree / diploma or doctorate from a college or university

27 **E4** How do you name your main occupation /primary profession?

- [ENTER TEXT]

28 **E5** Are there any important aspects regarding training needs and information on nature-based solutions and soil health that were not considered in this survey?

- [Entry text]

End of survey

Many thanks for your participation! Your collaboration is greatly appreciated.

Your input makes sure that the views of practitioners are considered in the development of new training resources on soil advice.

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Confederation
Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

For more information on the project and upcoming online training offers, please visit www.nbsoil.eu

If you want to join the NBSOIL Academy, please enrole here: nbsoil.eu/get-involved/

Your answers have been saved. You can close your browser now.

Kind regards

Olivier Ejderyan & Antonia Galbier

Contact: olivier.ejderyan@fibl.org

Co-funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER
State Secretariat for Education, Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).

Co-funded by
the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.

UK Research
and Innovation

This work has received funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant number 10061997.

Project funded by

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Education,
Research and Innovation SERI

This work has received funding from the Swiss State Secretariat for Education, Research and Innovation (SERI).