BIOSERVICES

This project has received funding from the European Union's Horizon Europe Research and Innovation Programme under grant agreement No 101112374

BIOservicES

Linking soil biodiversity and ecosystem functions and services in different land uses: from the identification of drivers, pressures, and climate change resilience to their economic valuation

Title: Co-creation Strategy

Deliverable: D1.1

Authors: Izaskun de Allende, Alba de Agustín, Maite Alonso

Report

Document summary	
Document Title	Co-creation Strategy
Author	Izaskun de Allende, Alba de Agustín, Maite Alonso
E-mail of principal author	ideallende@zabala.es
Lead beneficiary	Zabala Innovation
Deliverable No.	1.1
Work Package	WP1. Stakeholder communities for co-creation, co-innovation and co-learning
Dissemination type	R- Document, report
Dissemination Level	PU – Public
Release date	M18 (28/02/2025)
Review date	30/07/2025
Copyright	

Table of Content

Executive summary

Introduction to the deliverable

The “Co-creation Strategy” is a deliverable describing the background, actions and planification to organise engagement activities for co-design, co-creation, and co-learning of BIOservicES experimental sites with key stakeholders to contribute to the Mission Soil Implementation Plan. Specifically, the co-creation strategy aims at contributing to the Mission Soil establishment of 100 Living Labs across Europe.

This work is framed within BIOservicES *WP1. Stakeholder communities for co-creation, co-innovation and co-learning,* committed to strengthen and create stakeholder communities along the project as a central hub for collaboration. The Work package is divided in four tasks, these are interconnected and aim at leveraging stakeholder engagement opportunities.

Task 1.2 aligns with *Task 1.1 Identification and mapping of stakeholders*, by using the information on stakeholder mapping for each experimental site to define most suitable co-creation activities. Likewise, it also aligns with *Task 1.3 Animation of co-design, co-creation and co-learning activities involving COS,* in particular, with those activities related to Living Lab concepts. Finally, Task 1.2 goes hand in hand with *Task 1.4 Development of a digital platform to ensure an effective collaboration,* as this platform is to be used for fostering collaborations and sharing knowledge between experimental sites and other project collaborators.

Objectives of the deliverable

This deliverable contributes to *Task 1.2 Building an impactful community of stakeholders (COSs)* aiming at developing an effective collaboration framework for BIOservicES experimental sites to define all the elements needed to become part of a Mission Soil Living Lab.

Involving the Communities of Stakeholders (COS) of each experimental site of the project within this task, will allow to identify and integrate synergies between BIOservicES experimental sites and Mission Soil Living Labs. Therefore, the deliverable describes the Mission Soil Living Labs and the potential synergies with the BIOservicEs experimental sites.

Methodology applied

The methodology applied in task 1.2 involves comprehensive desk research to analyse how the Mission Soil is deploying its Living Labs across Europe; creating a database on existing Mission Soil Living Labs and their characteristics; and analysing BIOservicES experimental sites´ potential synergies with these Mission Soil Living Labs.

Results and next steps

This assessment provides the necessary information to propose a set of activities that will enable future collaboration opportunities between BIOservicES experimental sites and Mission Soil Living Labs. As a results of this assessment, a set of co-creation activities have been proposed in order to: a) support BIOservicES experimental sites to strengthen their capacities to collaborate with European Mission Soil LLs, and b) deep dive into collaborations within BIOservicES partners and with LL projects.

The co-creation strategy focuses on defining opportunities and challenges, strengthening stakeholder networks, identifying knowledge and experience, improving financing opportunities, and supporting collaborations with Mission Soil LLs.

At the time of publishing this deliverable, the co-creation activities and the stakeholder engagement in relation to task 1.2 have not yet started. Next steps involve further contextualising the co-creation strategy in collaboration with experimental sites coordinators, and connecting the specific activities to local needs, challenges, and opportunities. In this process, each activity will be further defined including objective, format, timing, target group and stakeholders to be involved. These stakeholders* will be selected from the mapping conducted in task 1.1. for each experimental site (D1.2), selecting those stakeholders that are best suited to the activity needs and objectives. This selection will also consider stakeholders interests and influence, as well as the benefits they can get from engaging in the co-creation activities. Stakeholders identified in Task 1.1 and engaged in task 1.2 will be motivated to support the BIOservicES experimental sites in achieving the operational framework to potentially evolve into a Living Lab.

**The BIOservicES stakeholder list is not included in this deliverable complying with GDPR.*

1 Introduction

The Co-creation strategy sets out the first steps to be taken for BIOservicES experimental sites to start collaborating with key stakeholders within the project but also among the Mission Soil network to establish the basis for co-design, co-creation and co-learning of new initiatives linked to Mission Soil LLs. This strategy will be updated yearly to reflect progress and adaptations to the activities proposed.

More specifically, this report describes the literature review conducted on the information related to Mission Soil Living Labs published in the last 18 months. This work serves as the basis to understand how BIOservicES experimental sites could relate to Mission Soil LLs and contribute to this framework. The learnings and conclusions from this analysis have resulted in the proposed co-creation strategy, which aims to serve as a guideline for experimental sites to start their journey towards contributing to EU soil health Living Labs.

BIOservicES acknowledges the complexity of integrating new concepts such as “Living Labs” among different land users and managers´ daily lives. This is why, the co-creation strategy will establish specific activities that could connect these concepts to local needs, challenges, and opportunities, so that meaningful and effective collaborations can occur.

1.1. Integration with Mission Soil Living Labs and maximising impact

The Mission Soil Living Labs (LLs) are defined as user-centred, place-based, and transdisciplinary research and innovation ecosystems that involve multiple partners to co-design, test, monitor and evaluate solutions in real-life settings for improving soil health. Mission Soil LLs are essential for addressing specific soil health challenges and advancing sustainable soil practices, fostering partnerships among land managers, scientists, businesses, and citizens[1]. Mission Soil LLs can vary by land use type (Fig. 1):

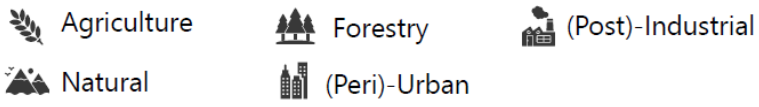

Fig. 1. Land use types of Mission Soil Living Labs. Mission Soil Living Labs & Lighthouses.

Mission Soil LLs comprise multiple experimental sites that are local sites that can be included in a LL area or be located outside a LLs area.

[1] Catalogue 2024 - Mission Soil Living Labs and Lighthouses

BIOservicES will test and validate its research activity in 25 experimental sites. These are not currently linked to any Living Lab, but the project believes that among these experimental sites distributed in 8 land uses (Fig. 2), there is potential for collaboration with the EU soil health Living Lab ecosystem and for contributing to the Mission Soil objectives.

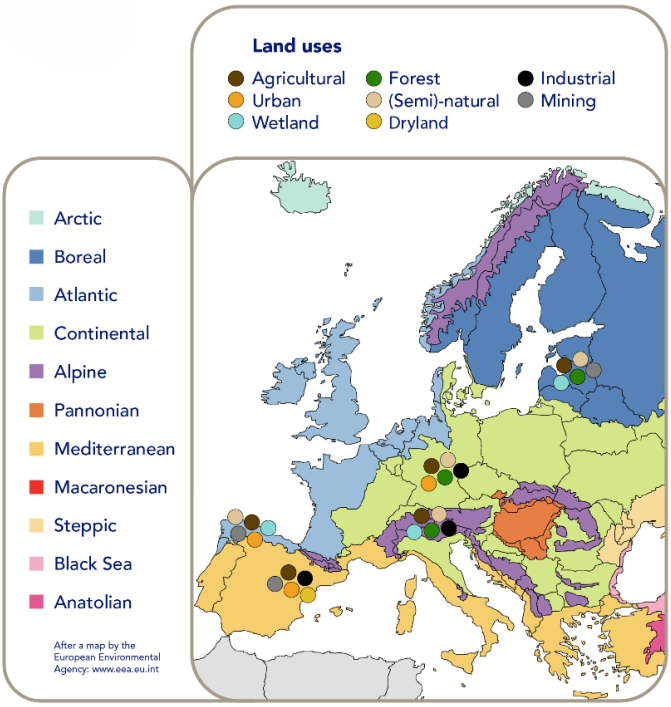

Fig. 2. BIOservicES experimental sites land uses.

From all experimental sites included in BIOservicES, the project aims at connecting the ones with most potential with existing Living Labs at European level. These experimental sites will be selected based on the results obtained when implementing the co-creation activities described in this deliverable.

Once selected, the experimental sites with potential to engage with existing LLs will receive support from BIOservicES in defining an Operating Framework to ensure that these experimental sites align with the criteria established by the Mission Soil for LLs (D1.3).

The **Operating Framework** consists of a definition of key pillars that may contribute to the implementation of Living Labs, or to strengthen experimental sites´ capacity to contribute to a Living Lab, such as:

- Identification of opportunities & challenges
- Identification of local stakeholders and existing networks
- Definition of available knowledge and experience
- Identification of financial opportunities
- External stakeholder networks & links with existing LLs

This will lead to build an impactful community of stakeholders strengthening the capacity of the experimental sites. The results, including the Operation Framework defined, will be included in D1.3 Handbook for COSs collaboration and co-creation by M52.

2 Mission Soil Living Labs

The Mission 'A Soil Deal for Europe' (Mission Soil) is a major instrument to co-design, assess, monitor, and implement actions to restore and protect soil so that it can continuously provide benefits to society and the planet. The Mission not only aims to maximise the benefits of soil health conservation and restoration in the EU, but also to minimise the adverse effects of land use outside the EU, and it will largely contribute to the overall goals of the European Green Deal.[2] The Mission's specific objectives include (Fig. 3):

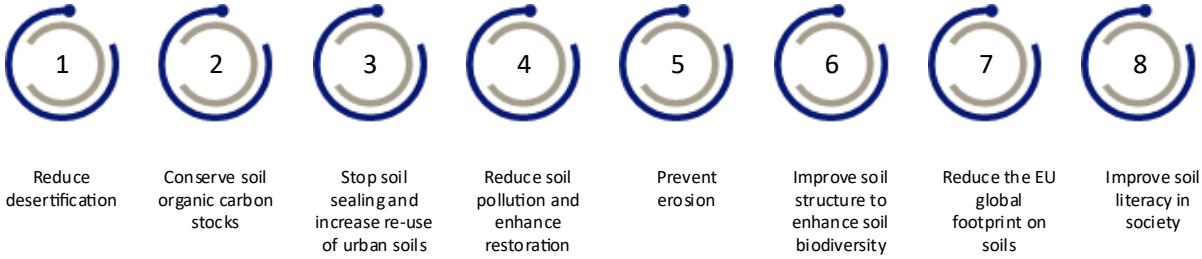

Fig. 3. Mission Soil objectives.

The Mission Soil will be implemented through:

- A **transdisciplinary research and innovation (R&I) programme** which includes a social science component to fill knowledge gaps and develop solutions for soil health. The Mission will address all types of land use in rural and urban areas.
- **A network of 100 Living Labs** (for experimentation) **and lighthouses** (for demonstration) to accelerate the co-creation and uptake of solutions across various settings in a diversified geographic and socio-economic context.
- A robust, harmonised EU framework for soil **monitoring and reporting**.
- **Communication and citizen engagement activities** to increase soil literacy across society.

In this sense, BIOservicES contributes to all the implementation criteria set out by the Mission Soil. This co-creation strategy in particular links to the network of 100 Living Labs (LLs) and Lighthouses (LHs) to be deployed across Europe.

[2] The Mission Soil | Mission Soil Platform

2.1 The first funded Mission Soil Living Lab projects

From the total of 100 Living Labs (LLs) to be implemented by the Mission Soil initiative across Europe, 25 LLs have already started their journey at the end of 2024. These LLs have been funded under five European projects:

- **GOV4ALL**[3]
- **iCOSHELLs**[4]
- **LILA4SOILS**[5]
- **LivingSoiLL**[6]
- **SOILCRATES**[7]

In addition to the 100 LLs to be funded by the Mission Soil[8], efforts are being made to expand the EU LL network and reach other LLs not funded by the Mission. This work will be mainly supported by the SOILL project[9] ensuring that these non-Mission funded LLs align with the Mission Soil LL criteria (Fig. 4). Thus, the identification of other European initiatives aligned to the Mission Soil objectives and LL criteria such as the BIOservicES experimental sites is key. These LLs will be evaluated following the SOILL project LL self-assessment and evaluation tool.

BIOservicES has already established collaboration bridges with Mission Soil EU projects, including SOILL, to follow up on these potential synergies with the European Soil LLs and LHs community.

[3] Governance and business models for living labs | GOV4ALL
[4] INNOVATIVE CO-CREATION SOIL HEALTH LIVING LABs | iCOSHELLs
[5] LILAS4SOILS
[6] Healthy Soil to Permanent Crops Living Labs | LivingSoiLL
[7] SOil Innovation Labs: Co-Regenerating And Transforming European Soils | SOILCRATES
[8] By the time this deliverable was published the second wave of funded LL projects were undertaking the GA negotiation process with the EC.
[9] About Us | Soill

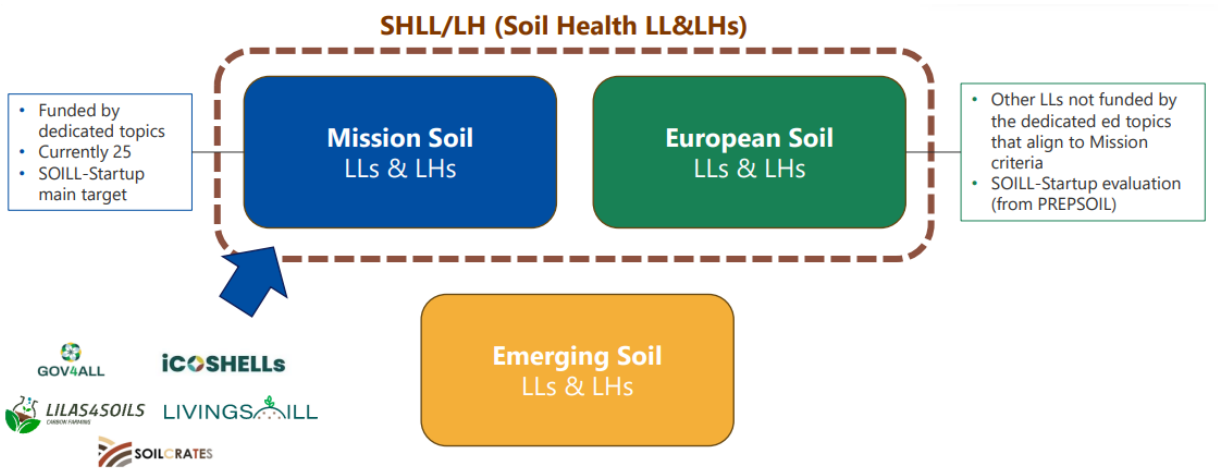

Fig. 4. Approach to Mission Soil 100 LL&LL Community. ©SOILL-Startup, 2024. Licensed under CC BY-SA 4.0.

3 The importance of building an impactful community of stakeholders (COS)

For the Mission Soil to be able to reach the objective to deploy 100+ LL&LHs across Europe, a cultural shift towards more collaborative working approaches is needed. Collaboration could be an enabler or a barrier to a LL success[10], whereas lack of coordination, time and cost of collaborations are the most frequently mentioned barriers.

This is where BIOservicES would contribute to, by increasing the understanding of how experimental sites might promote effective collaborations with each other, or with other established Living Labs. BIOservicES experimental sites are already demonstrating their willingness to measure and test new practices for soil health. Therefore, BIOservicES will focus on providing coordination support and project resources for experimental sites to work together and, with existing Living Labs.

As discussed in the previous section, LLs are collaborative initiatives to design, assess, monitor, and implement actions to improve soil health. The word collaborative refers to including perspectives from the Quadruple helix (academia, policymakers, civil society organisations and industry) (Fig. 5).

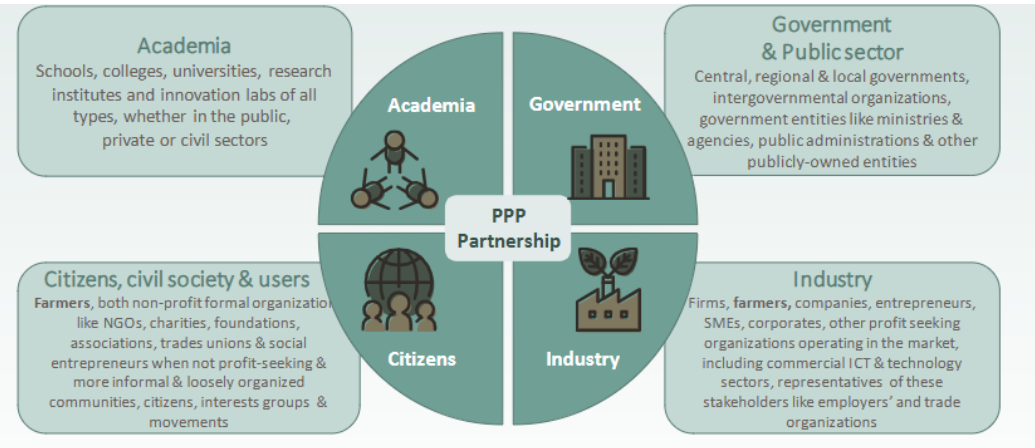

Fig. 5. Quadruple helix. NATI00NS project.

Therefore, the COS to be built around any Living Lab and its experimental sites should include the mentioned stakeholder profiles. In the case of BIOservicES experimental sites, task 1.1 has carried out a complete stakeholder mapping for each experimental site (D1.2).

[10] Berberi, A., Beaudoin, C., McPhee, C., Guay, J., Bronson, K., & Nguyen, V. M. (2023). Enablers, barriers, and future considerations for living lab effectiveness in environmental and agricultural sustainability transitions: a review of studies evaluating living labs. Local Environment, 1–19. https://doi.org/10.1080/13549839.2023.2238750

4 Co-creation strategy: A journey towards creating connections with Soil Health Living Labs at European level

After setting the scene on the Mission Soil conceptualisation of Living Labs and how BIOservicES aims to contribute to it, this section focuses on the collaborative approach and proposed activities for BIOservicES experimental sites exploring ways to maximize this contribution.

The section is divided in two sub-sections, the presentation of the methodology applied, and the defined co-creation activities. The sub-sections are structured as described below:

Methodology for the assessment and matching of Mission Soil Living Labs and BIOservicES experimental sites

The methodology describes the steps followed to understand the current EU Mission Soil Living Labs context and to find synergies with BIOservicES experimental sites characteristics. This section also focuses on identifying those BIOservicES activities proposed by project WPs that could contribute to the definition of an Operational Framework (D1.3) for experimental sites potential to contribute to LLs (e.g., defining incentives).

The methodology proposed is divided into 4 steps (Fig. 6):

1. **Desk research on EU Living Labs (LLs)** to gather knowledge on the Mission Soil conceptualisation of LLs and to create a state-of-the-art knowledge data base that would allow for making decisions and providing advice to experimental sites based on Mission Soil´s latest updates.
2. **Understanding Mission Soil Living Labs** to gain a deeper understanding on the specific characteristics of the 25 funded LLs (geographical distribution, objectives, partners, business models etc.).
3. **Understanding BIOservicES experimental sites** and their diverse characteristics to understand their context and linkages to soil health, goals and needs as key elements to support their participation in collaboration activities.
4. **Identifying synergies between Mission Soil LLs and BIOservicES experimental sites** to identify strengths and needs from both sides as a key background to define co-creation activities that support BIOservicES experimental sites strengthening collaborations beyond the project and potentially collaborate with Mission Soil LLs.

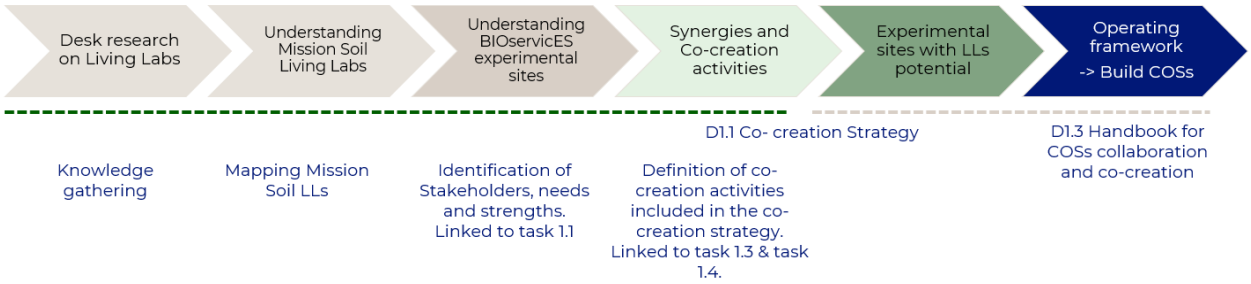

Fig. 6. BIOservicES co-creation strategy process and beyond.

Proposed Co-creation activities

The proposed co-creation activities include a description of the activities, its objectives and the expected outcomes. These activities contribute to each stage of the Operational Framework design and are grouped according to the stages. The stages are:

- Identification of opportunities & challenges
- Identification of local stakeholders and existing networks
- Definition of available knowledge and experience
- Identification of financial opportunities
- External stakeholder networks & with existing LLs

The goal of the co-creation activities is twofold. First, to support the BIOservicES experimental sites in strengthening their capacities, and second, to deep dive into collaborations within BIOservicES partners and with LL projects.

4.1. Desk research on EU Mission Soil Living Labs

As previously discussed, the Mission Soil has evolved significantly during the first years of its implementation journey. This leaded to many projects being working towards the Mission objectives including projects specifically setting the scene for Mission Soil related LLs to flourish.

BIOservicES has conducted a continuous and extended desk research on all the resources published on LLs within the Mission Soil initiative and has also actively participated in most activities organised by Mission Soil projects, focusing on this topic.

Resources reviewed:

- Mission Soil implementation plan
- PREPSOIL Booklet Soil Needs Workshops.pdf
- PREPSOIL Taxonomy and Self-assessment for Living Labs and Lighthouses in the Mission Soil context. A guide for users
- Catalogue 2024 - Mission Soil Living Labs and Lighthouses

There are a wide variety of resources and tools being developed by different Mission Soil projects. For this deliverable we have focused on those Mission Soil publications, resources and tools focused on better understanding and structuring Living Labs.

The Mission Soil implementation plan sets out the Mission background, goals, intervention logic and approaches, operational objectives, governance structure, budget and funding opportunities as well as an evaluation and monitoring framework. It serves as a compass for the implementation of 100 LLs across EU that will contribute to the 8 operational objectives to enhance soil health.

PREPSOIL, as the “Preparing for the "Soil Deal for Europe" Mission” project, facilitates the deployment of the Mission across European regions through the co-creation and roll out of tools and spaces for interaction, knowledge-sharing and co-learning. This is why some of the resources they have released are specific to support the LL conceptualisation and structuring. BIOservicES has used these to understand what are the characteristics that its experimental sites should have that could lead them to become part of an EU soil health LL.

Finally, the catalogue on the first 25 LLs funded under the Mission Soil and published in late 2024, has provided BIOservicES with the first framework of existing parameters to be considered for comparison with its experimental sites in order to find synergies and collaboration opportunities with those. This

work has been further developed under the section “Understanding Mission Soil Living Labs” and “Identifying synergies between Mission Soil LLs and BIOservicES experimental sites” of this deliverable.

Workshops and webinars attended:

- The Living Lab essential – how to set up a Living Lab | NATI00NS (
- Governance and Business Models for setting up a Living Lab | NATI00NS
- Core elements and specificities of the Living Lab topics | NATI00NS
- Caring for Soils: Insights from EU Mission Soil Projects on Measurement, Monitoring, and Management | SoilI
- NBSOIL Academy | Living Labs in Action: Mirafiori Sud, City of Turin

The Nati00ns workshops and webinars attended provided practical insights on how Mission Soil Living Labs could look like, from understanding its structure and definition under the Mission Soil, to meeting existing successful Living Lab structures across Europe related to soil health.

The NBSOIL Academy is a learning environment created by the NBSOIL EU project which will develop 4 theoretical and practical modules to enhance knowledge and skills to provide advice for sustainable soil management. One of the advanced modules will be focused on *Facilitating Soil Health Living Labs*, which will be attended by BIOservicES partners in order to gain further insights in this topic and look for further collaboration opportunities for project experimental sites. The module is not available yet.

Participation in Mission Soil communities:

- The Mission Soil | Mission Soil Platform
- Attended the Mission Soil Weeks 2023 and 2024
- SOILL Start-up community

Through active participation in these communities BIOservicES will continuously follow up on Mission Soil projects developments specifically on those related to Living Labs implementation processes.

BIOservicES actively participates in the 3 clusters coordinated by the Mission Soil Platform to support collaboration between Mission Soil projects. This deliverable links to the work carried out within the Cluster on Communication and Stakeholder Engagement where BIOservicES steers the Working Group on Stakeholder Engagement. This working group will develop a database on the different engagement approaches implemented by Mission Soil projects

and their best practices for collaboration between stakeholders. The learnings from the activity related to Living Labs will be used to adapt and enhance the co-creation activities proposed for BIOservicES experimental sites.

The Mission Soil Weeks organised every year provide opportunities for deeper communication and networking opportunities with other project partners and Mission Soil Platform Cluster annual meetings are also organised during this Week. Both in 2023 and 2024 BIOservicES partners participated as facilitators.

BIOservicES has also started communications with the Soil Start-up community where there has been some interest in the BIOservicES Operation Frameworks to be developed for experimental sites and aligning these with the self-evaluation and monitoring system to be implemented by Soil Start-up.

Collaborations with Mission Soil projects:

- **PREPSOIL**[11]: A few meetings have been organised to understand how the Operating Frameworks to be developed within BIOservicES could align with the PREPSOIL self-assessment tool for Living Labs which will be further developed by the SOILL-Startup project.
- **SOILL Start Up**[12]: As a continuation of PREPSOIL and NATI00N support projects, a meeting was held to understand how the BIOservicES approach to start investigating experimental sites potential to become part of a LL could also be supported by the SOILL project. It was agreed that when SOILL starts providing support to EU (non-Mission) LLs and emerging LLs, this collaboration between the two projects will be strengthened. BIOservicES has for now become part of the Soill Start-up community.
- **NBSOIL**[13]: As discussed before, several discussions have been held with NBSOIL Academy for BIOservicES to participate in the *Facilitating Soil Health Living Labs* module.

In addition, BIOservicES has also established links with Mission Soil projects through its digital platform[14], which is funded and developed in collaboration with the InBestSoil[15] project. The platform aims at creating an EU wide interactive community to exchange knowledge and practices on soil health matters. All projects above have shown interest in collaborating through the platform or using it for their own project collaboration purposes.

[11] About the Soil Mission and PREPSOIL | Prepsoil
[12] SOILL | Support Structure for Soil Health Living Labs and Lighthouses
[13] Soil Academy
[14] https://soilcommunity.app.
[15] Environment Protection - InBestSoil

4.2. Understanding Mission Soil Living Labs

In addition to the desk research on EU Living Labs on soil health, BIOservicES has analysed in detail the information available on the first 25 EU Soil Mission Living Labs (see page 9). This information is provided in the forementioned *Catalogue 2024 - Mission Soil Living Labs and Lighthouses*[16]. The catalogue includes a factsheet for each Living Lab describing the following information:

- Project name
- Type of soil
- Key strengths
- Mission Soil Objectives
- A descriptive text about the LL approach
- A list of partners
- Soil improvement techniques applied in the Living Lab

To analyse the funded Mission Soil Living Labs, a data base with key information on each Living Lab has been created based on the information included in the factsheets. The database has been presented in this deliverable in two tables for ease of reading:

- LLs geographical representation and soil type (table 1)
- LLs alignment with Mission Soil goals and their key strengths (table 2)

For the section of key strengths, those explicitly mentioned in the catalogue have been considered, and in addition, key words from the descriptive text describing the focus of the LL have been considered. Note that the current analysis presents those strengths mentioned in the catalogue and that Living Labs might have additional strengths to those identified.

The strengths have been grouped in 5 categories:

- Knowledge
- Collaboration & Networks
- Technical resources
- Living Lab goal

These categories provide insights into the aspects in which the BIOservicES experimental sites might find collaboration opportunities or gaps and aim to

[16] Catalogue 2024 - Mission Soil Living Labs and Lighthouses

facilitate the relationship between BIOservicES experimental sites and the funded Living Labs.

Mission Soil LLs´ geographical representation and soil type

The 25 Living Labs are distributed over 11 countries: Spain, France, Greece, Bulgaria, Poland, Portugal, Ireland, Italy, The Netherlands, Israel, and Sweden. All projects present Living Labs in three to six countries.

The soil types are agriculture, natural, forestry, (peri) urban, and (post) industrial, with one Living Lab focusing on peat land (table 1). While each project has Living Labs focusing on different soil types, from 25 Living Labs, 23 are based on agriculture land. There are also some Living Labs that combine soil types, including agriculture soil, but also natural, and/or forestry soils.

Table 1. Summary of Mission Soil EU funded LLs´ soil types and geographic distribution. (Source: table elaborated by ZABALA based on extracted information from the Catalogue 2024 - Mission Soil Living Labs and Lighthouses).

Mission Soil Project	LL name	Country	Agriculture	Forestry	Peri (Urban)	Natural	(Post) Industrial	Peat Land
iCOSHELLs	Basque	Spain - France			x			
	BUV SHELL	Bulgaria	x					
	Greek Mine SHLL	Greece					x	
	Italian LL	Italy	x			x		
	SES Shell Greennomed	Spain	x					
	Swedish SHLL	Sweden	x					
GOV4ALL	Aegean	Greece	x			x		
	Alvelal	Spain	x	x		x		
	Menorca Living soil	Spain	x	x		x		
	Solvi´terra	France	x					
	Thyrea	Greece	x	x		x		
SOILCRATES	French - Landes	France	x	x				
	Granada	Spain	x		x	x		
	Ireland mid-west	Ireland	x					
	LL North Netherlands	Netherlands	x					
LivingSoiLL	Andalusian	Spain	x					
	Grójec	Poland	x					
	Loire valley and	France	x					
	Luso-Galician	Portugal -	x					
	NW Italy Piemonte	Italy	x					
LILA4SOILS	Greek Carbon Farming	Greece	x					
	Iberian	Portugal -	x	x				
	SOFRALL	France	x					
	Share Innovation Lab	Italy	x					
	Upper Galilee	Israel	x	x				x

LLs alignment with Mission Soil goals and their key strengths

All the Living Labs within each funded EU project target the same Mission Soil Goals. While some projects target five goals (GOV4ALL, SOILCRATES), other

aim for four (LivingSoiLL), three (iCOSHELLS), or one (LILAS4SOILS) (table 2). The most targeted Mission Soil Goals are:

- Goal 2 Conserve soil organic carbon stocks.
- Goal 6 Improve soil structure to enhance soil biodiversity.
- Goal 8 Improve soil literacy in society.

None of the projects focus on:

- Goal 3 Stop soil sealing and increase re-use of urban soils.
- Goal 7 Reduce the EU global footprint on soils.

The Mission Soil goals that LLs aim at, seem to be linked with the strengths of each Living Lab, the applied soil improvement techniques, and the Living Lab goals (Table 2).

Table 2. Summary of EU Mission Soil LLs´ alignment with Mission Soil goals and key strengths. (Source: table elaborated by ZABALA based on extracted information from the Catalogue 2024 - Mission Soil Living Labs and Lighthouses).

Mission Soil Project	iCOSHELLs						GOV4ALL					SOILCRATES				LivingSoiLL					LILA4SOILS				
Mission Soil Goal(s)	4, 6, 8						1, 2, 5, 6, 8					2, 4, 5, 6, 8				2, 5, 6, 8					2				
Mission Soil Living Lab	Basque LL	BUV SHELL	Greek Mine SHLL	Italian LL	SES Shell Greennomed	Swedish SHLL	Aegean	Alvelal	Menorca Living soil	Solvi´terra	Thyrea LL	French LL - Landes	Granada LL	LL Ireland mid-west	LL North Netherlands	Andalusian	Grøjec LL	Loire valley and	Luso-Galician	NW Italy Piemonte	Greek Carbon Farming	Iberian LL	SOFRALL	Share Innovation Lab	Upper Galilee
Knowledge																									
Focus on knowledge exchange and capacity				x																					
Research running/ research groups	x	x					x						x		x		x				x	x		x	x
Specific/technical expertise	x	x	x	x	x	x		x		x	x	x		x	x	x		x	x	x			x	x	
Project management/coordination expertise			x															x							
Regulations knowledge	x																								
Experience with previous projects							x									x					x				
Living lab management /expertise												x	x		x		x								
Collaboration/ Networks																									
Cross-border collaboration	x																		x			x			
Citizens involvement	x								x																
Stakeholder network		x		x		x		x	x	x	x					x	x				x				
Political endorsement							x																		
Engagement with farmers		x				x		x	x							x	x				x			x	x
Collaboration with private companies		x															x								
Technical resources																									
Experimental design/ experimental farm					x					x											x			x	
Existing running pilots							x																	x	
Testing/analysis capabilities					x																			x	
Access to technology (industry partnerships etc.)		x																			x	x	x		
Modelling tools																					x				
Monitoring in place																						x			
Data management (and IA)														x											
Living Lab goal																									
Agroecological and eco-engineering solutions				x	x	x	x	x	x	x		x	x	x	x	x	x		x	x		x			x
Digitalization of agroecosystems																x									
Sustainable Business Models						x				x	x					x					x				
Protect culture and biodiversity & wealth	x																								
Phytoremediation (mine land)			x																						
Farming products comercialisation & logistic support									x																
Refine policy						x																			

There is a large diversity between the 25 funded Living Labs. Still, the goal of most Living Labs relates to identifying and applying agroecological and eco-engineering solutions.

Other goals targeted by few Living Labs are digitalisation of agroecosystems; generate carbon credits as a sustainable business model; protect culture and biodiversity while generating wealth; apply phytoremediation for soil recovery (e.g., in mine land); support the commercialisation of farming products specially in remote areas; and refine policy through collaborative process.

These Mission Soil Living Labs present multiple strengths that facilitate achieving these goals. Indeed, most LLs highlight a specific knowledge or soil

technical expertise as a strength. Others identify knowledge on regulations, or project management. Many Living Labs emphasise experience gained through the participation in previous projects, collaboration with research groups, and/or managing other Living Labs.

Quadruple helix collaborations are the basis for operating Living Labs. Therefore, many Living Labs rank stakeholder network in their strengths. Then, depending on the focus of the Living Lab, the collaboration actions vary between citizens involvement, farmers engagement, political endorsement and/or collaboration with private companies. Cross-border collaboration is part of three Living Labs.

Living Labs are a real-life testing environment. In this regard, some Living Labs highlight their capacities for running experiments in experimental farms and for doing experimental design. Some Living Labs emphasise their participation in existing running pilots and/or the testing and analysing capabilities. Modelling tools, monitoring systems, access to technology and data management skills are some other key strengths.

4.3. Understanding BIOservicES Experimental Sites

This section describes the **25 BIOservicES experimental sites**, distributed across five biogeographic regions: Alpine (Switzerland), Atlantic (Spain), Boreal (Latvia), Continental (Germany) and Mediterranean (Spain). Each biogeographic region includes **five experimental sites**, showcasing various land uses and distinct characteristics. These characteristics are presented in the tables corresponding to each region (Tables 3–7) and include:

- Land use (activity).
- Soil type/ vegetation.
- Soil Health pressure.
- Soil Health practices (available only for some experimental sites).

Alpine Region

The Alpine region is situated in Northeast of Switzerland, in the canton of Graubünden (Grisons) (Fig. 7). The five experimental sites of the region are located in three different municipalities: Trin, Bonaduz and Chur.

FiBL is the regional coordinator of the Alpine experimental sites. They are one of the world's leading research institutions for organic & sustainable agriculture. FiBL conducts research in close cooperation with practitioners and systematically addresses their problems to jointly develop new solutions.

Fig. 7: Alpine region.

Table 3: Alpine Region Experimental Sites´ soil characteristics.

Country	Switzerland				
Experimental site	**Exp.1**	**Exp2**	**Exp3**	**Exp 4**	**Exp 5**
Land use (activity)	Agriculture (crops)	Agriculture (milk & meat)	Industrial (skiing run &lift)	Semi-natural (forest&pasture)	Wetland (Nature Protection Site)
Soil type/ vegetation	Deep Regosol/ crop rotation, tillage system	Regosol/ Grassland	Technosol, Cambisol, Podzol, Regosol/ Grassland, bushes	Regosol/ Trees and natural vegetation	Peat partly under water/ Natural vegetation of a fen bog
Soil health pressure (challenge)	Soil fertility, structure & climate regulation	Biodiversity loss, Compaction& Nutrient balance	Biodiversity loss, contamination & erosion	Biodiversity loss & compaction	Biodiversity loss & red list species conservation
Soil health practices (goal/ knowledge/ solution)	Soil optimization management			Afforestation and/or natural rejuvenation	Biomass removal Fen bog under protection

Atlantic region

The Atlantic region is situated in the Northwest of Spain, in the region of Galicia (Fig. 8). The five experimental sites of this region are located in the province of Ourense, in the southeastern part of Galicia.

Fig. 8: Atlantic region.

University of Vigo (UVigo) is the regional coordinator of the Atlantic experimental sites. It is a public university in Galicia with a strong emphasis on research, innovation and sustainability and it is involved in several research projects about soil health. **Fundación Juana de la Vega (FJV)** oversees stakeholder engagement and the governance aspects in the Atlantic region´s experimental sites. The Foundation promotes knowledge, conservation, and the development of rural areas in Galicia, focusing on rural development, innovation, landscapes, and academic training.

Table 4: Atlantic Region Experimental Sites´ soil characteristics.

Country	Spain				
Experimental site	**Exp.1**	**Exp2**	**Exp3**	**Exp 4**	**Exp 5**
Land use (activity)	Agriculture (Vineyards)	Mining (Gravel production)	Semi-Natural	Urban (Urban gardens and urban forest)	Wetland (flooded areas during wet season)
Soil type/ vegetation	Regosols and Technosols/ Vineyards and some small grasses	Technosols and Leptosols/ Nothing or pine trees plus bushes	Regosol/ Acacia dealbata, Pinus pinaster and Quercus robur	Technosol and Umbrisols / Grasses, garden trees abd a mixed riverine forest	Gleysols/ Riparian, grasses, crops
Soil health pressure (challenge)	Biodiversity loss, Compaction, soil contamination	Biodiversity loss, Organic Matter loss, compaction, Contamination	Biodiversity loss, potential soil compaction	Biodiversity loss, compaction, contamination, soil sealing	Biodiversity loss, soil contamination (herbicides) and vegetation clearing

Continental region

The Continental region is situated in Germany, in the Rhineland area (Fig. 9). The five experimental sites are located nearby in different municipalities of the area.

Fig. 9: Continental region.

Thünen-Institute of Biodiversity (TI) is the regional coordinator of continental experimental sites. TI conducts research on the diversity of species and ecosystems, focusing on their sustainable use, conservation, and role in agriculture and forestry. **Flachenagentur Rheinland GMBH (FAR)** is the continental field site coordinator, and it is an advisor for SMEs. They specialize in landscape planning, biodiversity projects, and managing ecological compensation for agricultural and development projects.

Table 5: Continental Region Experimental Sites´ soil characteristics.

Country	Germany				
Experimental site	**Exp.1**	**Exp2**	**Exp3**	**Exp 4**	**Exp 5**
Land use (activity)	Agriculture (crop rotation in commercial farms)	Forest (Tree harvesting in deciduous forests)	Mining (Opencast mining)	Semi-natural (grassland management)	Urban (Green space for leaisure and aesthetic purposes)
Soil type/ vegetation	Cambisol /conventional crop rotation	Cambisol / Forest	Technosol/Forest	Cambisol /Grassland	Technosol / typical park vegetation incl. lawns and bushes
Soil health pressure (challenge)	Biodiversity loss, compaction, erosion	Biodiversity loss, Compaction& Nutrient balance	Biodiversity loss, organic matter loss, contamination	Biodiversity loss, surplus N-input, organic matter loss	Biodiversity loss, pollution (plastic dispersal), soil sealing
Soil health practices (goal/ knowledge/ solution)	Reduction of high-input crops (here: maize) in a crop rotation to reduce management intensity and to reach out for more sustainability	Reduction of tree harvest frequency	Transformation of landscape and land use from soil loss due to mining towards soil redeposition and forestry	Sustainable use of natural grassland by low mowing frequency per year and mitigated N-fertilization	Reduction of soil sealing by creating green spaces in urban areas

Boreal region

The Boreal region is situated in the capital of Latvia, Riga (Fig. 10). The five experimental sites associated to this region are in the municipality of Riga.

Latvian State Forest Research Institute (SILAVA) is the regional coordinator of Boreal experimental sites. It is Latvia's public leading forest research centre, specializing in forestry and related research and development. **SIA RIGAS MEZI (RM)** is a municipal company responsible for managing the forests and green spaces within the city of Riga. It oversees Stakeholder's engagement and governance aspects in the Boreal region.

Fig. 10: Boreal region.

Table 6: Boreal Region Experimental Sites´ soil characteristics.

Country	Latvia				
Experimental site	**Exp.1**	**Exp2**	**Exp3**	**Exp 4**	**Exp 5**
Land use (activity)	Agriculture	Forest	Mining	Semi-natural	Wetland
Soil type/ vegetation	Planosols / Field and/or biomass crops	Podzol/ Forest on mineral soil	Sedimentary rock - Sand / Recultivated to forest	Gleysol, Retisols / Shrubland/ low density forest	Histosols / Wetland Forest
Soil health pressure (challenge)	Nutrient imbalance	Nutrient imbalance, Acidification & Eutrophication	Biodiversity loss & Erosion	Organic material loss & Compaction	Nutrient imbalance & Acidification

Mediterranean region

The Mediterranean region is situated in the Northeast of Spain, in the Region of Aragon (Fig. 11). The five land uses associated to this region are in the same municipality, Andorra.

Fig. 11: Mediterranean region.

Consejo Superior de Investigaciones Científicas (CSIC) is the regional coordinator of Mediterranean experimental sites. It is Spain's largest public research institution and conducts research across various fields, including life sciences. **Agro cultivate** is the Mediterranean field site coordinator. This organisation located in Andorra focuses on sustainable agriculture, aiming to enhance sustainable farming practices through innovative solutions. The company offers services that help farmers improve productivity while ensuring environmental stewardship.

Table 7: Mediterranean Region Experimental Sites´ soil characteristics.

Country	**Spain**				
Experimental site	**Exp.1**	**Exp2**	**Exp3**	**Exp 4**	**Exp 5**
Land use (activity)	Agriculture (cereal annual crops in a farm)	Industrial (factories)	Dryland (pine and bushes forest)	Mining	Wetland
Soil type/ vegetation	Calcisol/ Field crops (mainly cereals)	Calcisol / Shrubs	Calcisol / Shrubs	Technosol / Shrubs	Calcisol/ Ornamental
Soil health pressure (challenge)	Organic matter, erosion, soil structure & fertility loss	Biodiversity loss, erosion and pollution drift.	Biodiversity and organic matter loss & erosion	Biodiversity, organic matter loss & erosion	Biodiversity loss
Soil health practices (goal/ knowledge/ solution)	Optimization management practices.	Nature restoration, biological walls.	Optimize the dryland coverage	Ground clearing management and ground restoration.	Green areas design and management

4.4. Identifying synergies between Mission Soil Living Labs (LLs) and BIOservicES experimental sites

After analysing the European soil health LL context, the first wave of Mission Soil LLs and the BIOservicES experimental sites, this section aims at describing the process to identify high-level synergies between BIOservicES experimental sites and Mission Soil LLs.

Understanding Mission Soil LLs provided insights into the aspects that could be considered to identify potential collaboration opportunities with BIOservicES experimental sites. Understanding BIOservicES experimental sites provides an overview of their diversity and different maturity levels. Some have certain knowledge and data on soil health due to prior piloting and testing in their fields, while others are exposing the sites to piloting for the first time. Therefore, we find a wide variety of "maturity" aspects within the experimental sites that will impact the collaboration activities to be proposed.

On the other hand, experimental sites are the unit part of a complete LL, meaning that they can contribute to the maturity of a LL but, individually, they do not meet all the aspects that a LL is set to have. Despite this acknowledgement BIOservicES believes that exploring collaboration options for individual experimental sites in different maturity stages, might contribute enriching the European Living Lab scenario, by either expanding the existing LLs with additional experimental sites joining their efforts, or by creating new LLs.

When developing this deliverable, one of the main learnings has been that the LL concept might sound complex to experimental sites not yet connected to the Mission Soil initiative. Therefore, when projecting future opportunities for these experimental sites to collaborate with, or to become future LLs, multiple concerns and limitations arise. To overcome this uncertainty and support BIOservicES experimental sites in developing a forward-looking exercise, BIOservicES has implemented a **Backcasting methodology**. Backcasting first looks ahead to define a desirable future end-state or vision, and then works backwards to identify the steps and solutions necessary to get there, starting from an assessment of the current situation, context, gaps, and needs[17]. This is illustrated in Fig. 12 below.

[17] Mutual learning exercise - Publications Office of the EU

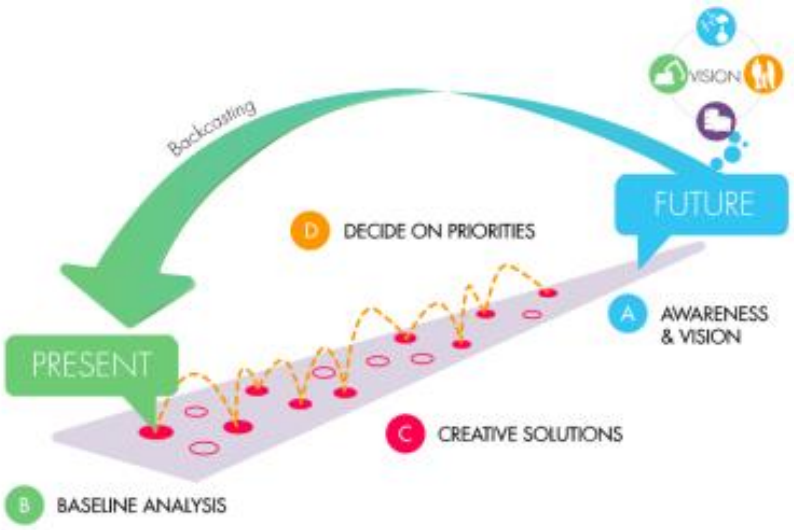

Fig. 12. The Backcasting planning approach as illustrated by The Natural Step[18]

The BIOservicES Backcasting consisted in looking into a future scenario where each experimental site is fully collaborating within a Mission Soil LL, and stepping back to nowadays, to define step by step actions that could be taken to achieve the ideal scenario.

These actions have been categorised in the form of co-creation activities that aim to strength the capacities of the experimental sites and fulfil their current needs preparing them for future collaboration opportunities.

The backcasting exercise was carried out following these steps:

Synergies survey

A survey was created to identify the strengths and needs of the BIOservicES experimental sites, according to the Mission Soil LL listed categories (page 19), and to establish a baseline in relation to their maturity, based on the BIOservicES Operating Framework pillars (see page 7). Acknowledging the diversity among the experimental sites of each region, one survey has been completed per region, but making note of the different maturity levels within these experimental sites. The survey (appendix A) consists of 7 questions, and collects the perspective of experimental site coordinators about these aspects:

- Strengths and needs of experimental sites: To what extent the topics addressed by Mission Soil LLs are strengths or needs for the experimental sites: knowledge & data, collaboration networks, running pilots, technological resources, funding & market positioning and regional awareness.

[18] 6 Our Approach: The Natural Step Framework (215) The Natural Step. https://thenaturalstep.org/approach/

- Maturity on the elements of the Operational Framework: How far are the experimental sites from identifying their best practices, opportunities, and challenges, creating stakeholder networks, collaborating with LLs or LHs, defining their sustainable business models or from understanding available funding opportunities.
- Specific soil challenge addressed: The experience of experimental sites in addressing any specific soil challenge and their alignment with mission soil goals.
- Preferred collaboration type: Most preferred type of collaborations (e.g., Living Labs with specific type of soils).

Follow up meetings

After completing the survey, one-to-one meetings with BIOservicES experimental site coordinators were organised. The goal of the meetings was to discuss activities that could bring value to the experimental sites in relation to future collaborations with LLs. During these meetings, experimental site coordinators shared their concerns and things to be considered when engaging with experimental sites.

Results from the survey and meetings

BIOservicES experimental sites coordinators recognize the diversity of regions and land uses, as well as the various ways each site can contribute to healthy soils. When it comes to aligning with Mission Soil goals, all experimental sites selected *Goal 2, Carbon Stocks* and *Goal 6, Soil structure and biodiversity*. Still, most experimental sites can support multiple goals, including enhancing soil literacy, and mitigating soil erosion, desertification, pollution, sealing and footprint in soils (Fig. 13).

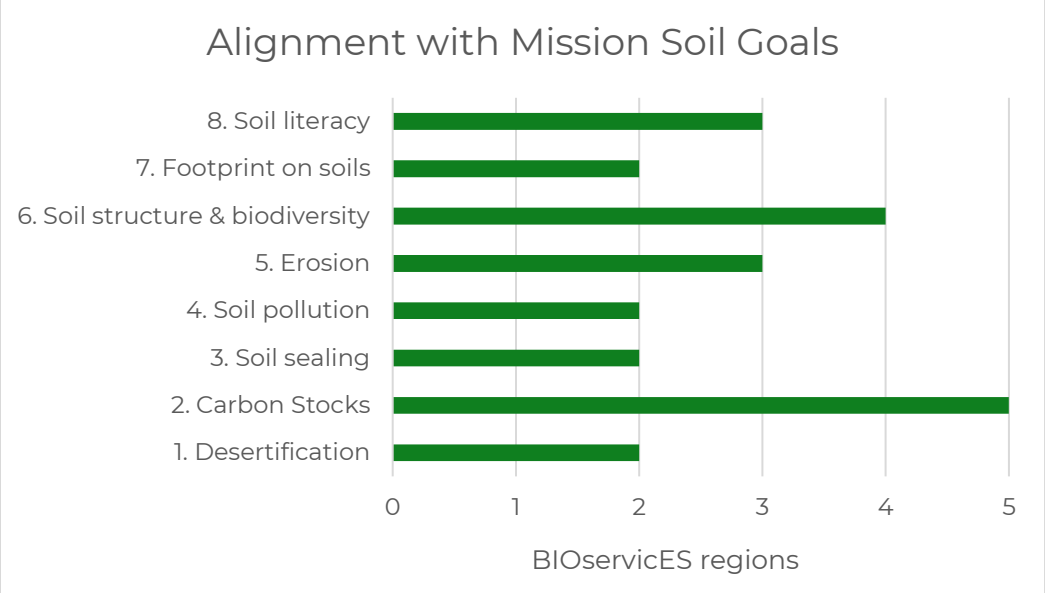

Fig. 13: Alignment of the BIOservicES experimental sites with Mission Soil Goals.

BIOservicES experimental sites are in different stages of maturity (Fig. 14). Some have never conducted piloting or testing on their land and are participating in a European project for the first time. Others have extensive experience, having collected data, implemented, and tested innovative solutions for soil health preservation. These more established sites have developed stakeholder networks and are actively running pilots. Regardless of their maturity stage, all experimental sites can benefit from co-creation activities that enhance their capacities and align their needs with other European initiatives.

For those experimental sites in an initial stage of research and innovation practices, the need to focus the activities at local level has been emphasized. For example, focusing on local networks and solving conflicts of interests in the region should be prioritised over international stakeholder networks. For

experimental sites with more experience, finding linkages with more evolved initiatives such as Mission Soil LL appears to be the “next step”.

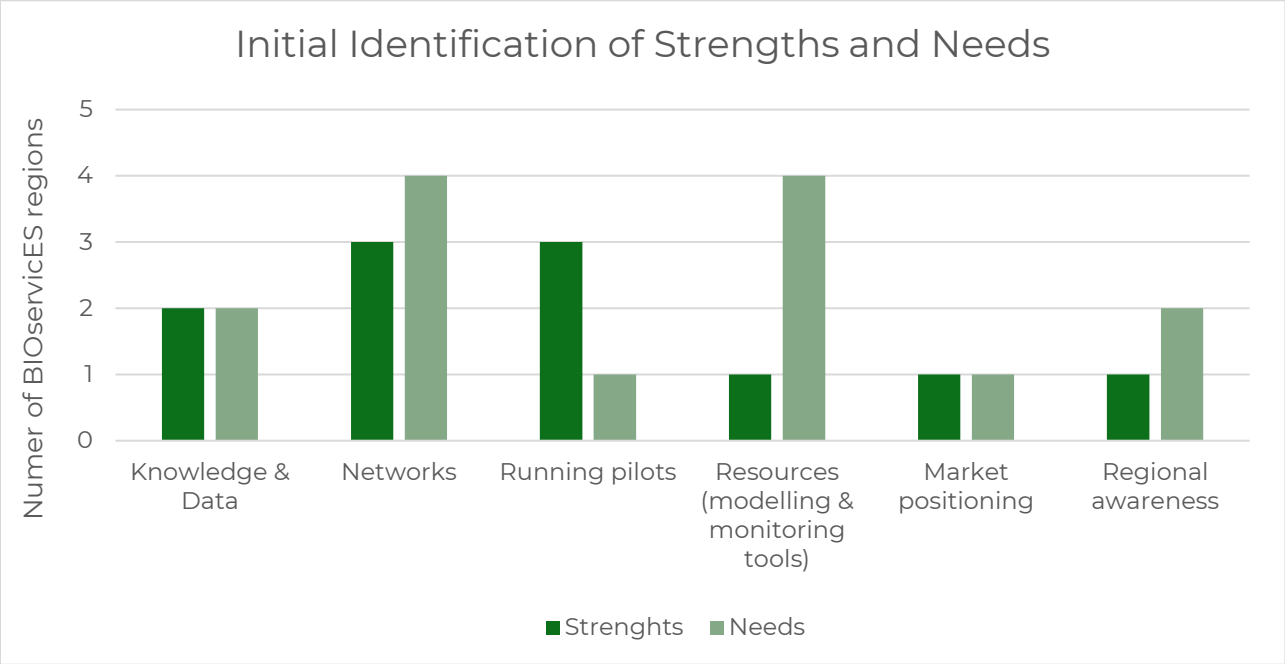

Fig. 14: Initial identification of BIOservicES experimental sites strengths and needs.

When assessing to what extent experimental sites have identified their best practices or their opportunities and challenges, different maturity levels can be observed (Fig. 15). Some experimental sites have already conducted the identification exercise; however, advice and support could be beneficial to update their results. Others have not carried out these identification exercises, but they could be interested in learning how others have done it (Fig. 15).

In the case of collaborations with external stakeholder networks or LLs, none of the experimental sites has developed this aspect in depth. In general, experimental sites have not been in contact with LLs or LHs, and defining their sustainable business models or identifying funding opportunities is seen as a goal for the future (Fig. 15).

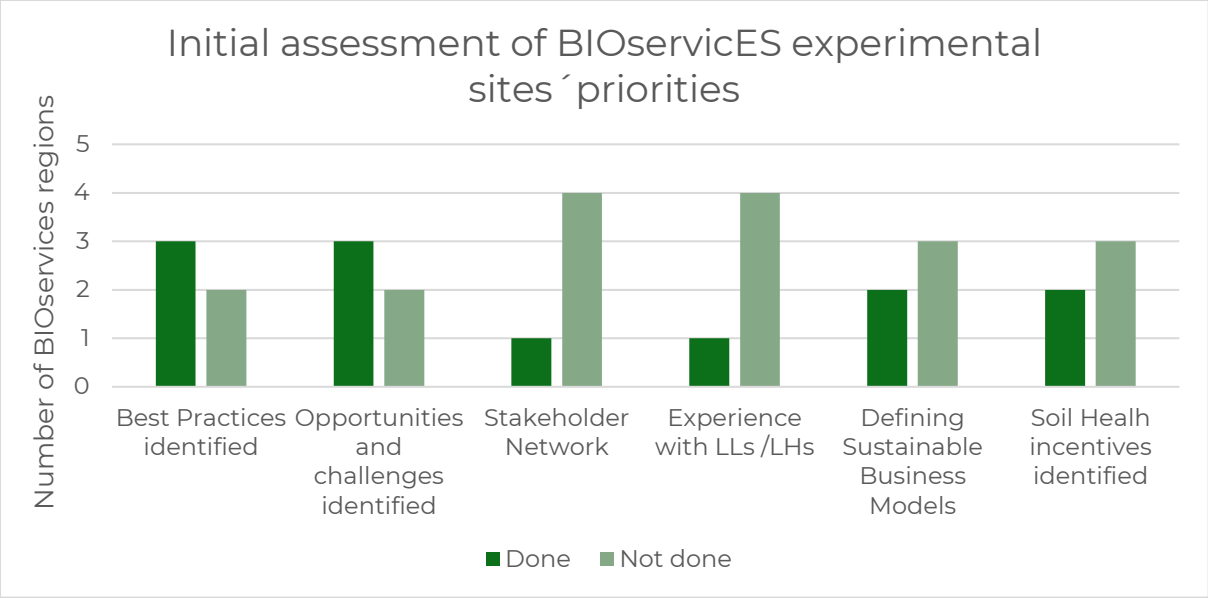

Fig. 15: Initial assessment of BIOservicES experimental sites´priorities.

The BIOservicES project presents great potential for knowledge sharing and cross-site learning among experimental sites. Skills and knowledge, as well as resources can be gained from engaging in co-creation activities that focus on strengthening stakeholder networks and in those to further understand and define the experimental sites. These skills could elevate the maturity level of the experimental sites, getting them closer to collaborate with Mission Soil funded Living Labs.

Therefore, acknowledging that most experimental sites are on an early stage to develop collaborations, all site coordinators express interest in exploring potential partnerships with other experimental sites or LLs across the EU, particularly those focused on agriculture, forestry, and/or natural soils.

In addition, all BIOservicES experimental sites show interest in the opportunity to collaborate on future Living Lab project proposals. Regarding other funding sources, some have interest in cascade funding from Mission Soil LLs, and soil health incentives.

Finally, in relation to sustainable business models this seems to be a key area for experimental sites. However, they rather prioritise strengthening their stakeholder networks and learning from peers through knowledge sharing activities.

4.5. Co-creation activities proposed

After completing the methodology for analysing the context surrounding EU LLs, assessing the characteristics of BIOservicES experimental sites, and conducting an initial exploration of their potential relationships, a set of co-creation activities has been proposed. The goal of the co-creation activities is twofold. First, to support the BIOservicES experimental sites in strengthening their capacities, and second, to deep dive into collaborations within BIOservicES partners and with LL projects.

These co-creation activities will be designed to support BIOservicES experimental sites to establish connections to existing LLs. To facilitate alignment, we will explore potential connections by comparing the characteristics of LLs (as described in Table 1 and 2) with those of BIOservicES experimental sites detailed in Tables 3 to 7. Furthermore, we will identify synergies between the practices, activities, strengths, goals, and priorities of the LLs (also outlined in Table 2) and those of the experimental sites, as illustrated in Figures 13 to 15. These comparative insights aim to reveal concrete opportunities for collaboration and mutual learning. To further elaborate, a deeper analysis will be elaborated in collaboration with ES coordinators, and through targeted discussions with relevant Mission Soil LL projects. In parallel, the co-creation activities will be further contextualised, defining their objectives, format, timing, target group and involved stakeholders (in collaboration with Task 1.1), ensuring their relevance to each biogeographic region and experimental sites.

In a nutshell, the final objective of implementing these co-creation activities is to further analyse the strengths and interests of BIOservicES experimental sites and to support them in the journey to explore potential collaborations with at least two established Living Labs.

Once these experimental sites are identified, an Operation Framework describing how these experimental sites could meet a LL criteria will be elaborated (D1.3). The Operational Framework will include, as mentioned earlier in this document:

- Understanding challenges and opportunities
- Identification of local stakeholder networks
- Identification of available knowledge or experience
- Identifying financial schemes and opportunities
- External collaboration opportunities & links to other LLs

Therefore, the co-creation activities proposed will focus on the forementioned 5 pillars. The co-creation strategy, specific co-creation activities and potential collaborations will be yearly reviewed and updated when needed, based on updates and developments within the Mission Soil LL community, such as new waves of funded Mission Soil LL. In the same form, as the experimental sites gain experience and progress in their maturity level, activities can be adjusted, or new activities might be proposed.

4.5.1. Identifying challenges and opportunities

The initial survey (page 28 - 29), provided an initial identification of the strengths and needs of the BIOservicES experimental sites. Following the analysis of strengths and needs, discussions with experimental sites suggested that conducting a more detailed exercise to refine the mapping could be valuable. This would help better align specific challenges and needs with existing LL priorities.

Activity: Collaborative SWOT analysis

- Description: The activity aims to connect specific challenges and needs implementing soil health practices by BIOservicES experimental sites with challenges and needs being prioritised or addressed by exiting Mission Soil LLs. The activity will be implemented in the form of a collaborative workshop with BIOservicES experimental sites, following a methodology to create a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis. The experimental sites will collaboratively discuss their own challenges and needs, inspiring others and identifying common points of interest between them and with existing Mission Soil LLs.
- Objective/ Expected outcome: From this activity, themes of most interest and common needs will be identified among BIOservicES experimental sites that could lead to collaborations with Mission Soil LLs. The activity outputs will also serve for adapting and contextualising future co-creation activities.

4.5.2. Identification of stakeholders and existing networks

As previously discussed, during the survey and follow up interviews carried out (page 28 - 29) it was noted that different experimental sites had different interests and capacity in relation to creating networks or engaging with stakeholders around their experimental sites.

In addition, BIOservicES Task 1.1 has already identified and mapped key stakeholders across the value chain of the 25 project experimental sites.

Activity: Alignment of stakeholder mapping with Operational Framework pillars

- Description: the co-creation activities to be conducted within this pillar will focus on identifying which stakeholders from the mapping conducted in T1.1 will be most suited to participate in the activities proposed for the development of the Operational Framework.
- Objective / Expected outcome: After completion of this activity, each experimental site will have selected the most appropriate stakeholders to be involved in each of the co-creation activities. This will support the experimental sites strengthening their collaborations with stakeholders and creating networks.

4.5.3. Available knowledge and experience

During the survey and the interviews conducted with BIOservicES experimental site coordinators, it was identified that each experimental site has available knowledge or experience that could be interesting to share with other BIOservicES experimental sites and with existing LL. However, a need to further understand the Mission Soil LL context and the LL criteria was identified. The co-creation activities within this pillar will focus on creating a common understanding of the Mission Soil LL community and concepts to identify most suitable topics for experimental sites to put forward to engage in collaborations with EU Living Labs.

Activity: Workshop on funded Living Labs and potential collaboration for knowledge sharing

- Description: the co-creation activity will mainly focus on collaboratively identifying which knowledge and experience from the experimental sites, including the knowledge generated within the BIOservicES project, could be linked to the work that Mission Soil Living Labs are carrying out. In this collaborative session, experimental sites will be trained on Mission Soil LLs characteristics and Mission Soil established criteria. This activity will be conducted in a workshop format, in which participants will identify and share findings on soil bio-organisms important for soil health in specific land uses (e.g., vineyards). Next, the identification will be collaboratively linked to Mission Soil LLs with similar land uses for which such expertise could be of value.

- Objective / Expected outcome: This activity will result in increasing BIOservicES´ 25 experimental sites knowledge on the EU soil health Living Lab panorama, so these are better prepared to engage in future collaborations with other EU projects beyond BIOservicES. In addition, this activity will value the expertise and knowledge created within BIOservicES and support identifying knowledge sharing possibilities for improving soil health across Europe based on soil biodiversity.

Activity: How to collaborate through the Soil Community platform

- Description: Several webinars on soil health related topics are to be organised in the Soil Community platform, aiming to increase collaborations, stakeholder engagement and knowledge sharing. To facilitate the participation of BIOservicES experimental sites in these webinars and ensure effective use of the available tools, a workshop will be organized. This workshop will enable experimental sites to engage with the Soil Community platform and leverage its collaboration features.
- Objective/ expected outcome: The experimental sites are going to be encouraged and prepared to participate and organise soil community activities and to use the Soil community platform for their own collaboration activities efficiently.

4.5.4. Identifying financial schemes and opportunities

One important step of the Operating Framework will be to analyse the financial schemes and opportunities that may contribute to further funding these experimental sites activity on soil health protection and eventually to become part of a Mission Soil community LL.

These financial opportunities will be closely related to the aspects defined for each experimental site in the previous activities and pillars. BIOservicES will analyse and identify funding sources and opportunities for these experimental sites to engage with existing Living Labs.

Activity: Workshop on EU funding and Mission Soil opportunities.

- Description: This activity aims at working together with experimental sites, collecting all the information from previous activities (e.g. identification of challenges and opportunities, knowledge and experience) and linking these to existing financial opportunities at the European level in relation to participating or establishing new LLs. Funding opportunities such as Mission Soil LLs cascade funding calls or Mission Soil LL calls will be analysed, as well as potential collaboration

opportunities with organisations and consortiums active in soil health LL projects.

- Objective /expected outcome: BIOservicES experimental sites will better understand the European funding structures available to Living Labs or within them and will be better prepared to prepare proposals to collaborate with LLs of interest and potentially access funding.

Activity: Co-create a funding roadmap for BIOservicES experimental sites aligned with Mission Soil LL business models.

- Description: Based on the knowledge acquired in the previous workshop, and activities, a roadmap with dates, calls details and tips will be prepared with each BIOservicES experimental site with potential to collaborate with existing LLs. These roadmaps will also be included in the Operation Framework to be developed for those experimental sites most prepared to collaborate with LLs. These will support BIOservicES experimental sites connecting and finding collaboration opportunities with Mission Soil LLs with similar business model approaches.
- Objective / expected outcomes: BIOservicES experimental sites with potential and interest to contribute to the Mission Soil LL community, will have a clear pathway to choose from and to prepare for, in relation to funding possibilities at the time the roadmap is developed and beyond.

4.5.5. External collaboration opportunities & links to other LLs

Following the results from the identification of synergies between BIOservicES experimental sites and Mission Soil LLs, we can conclude that although the Mission Soil LL community and projects like SOILL will provide a lot of opportunities for collaboration, most BIOservicES experimental sites are far from engaging with these initiatives.

This is why the co-creation activities included in this pillar will be focused on increasing BIOservicES experimental sites´ knowledge on the Mission Soil ecosystem and collaboration opportunities. In addition, the activities will also aim at providing experimental sites with resources and tools to promote their work and facilitate exchanges with other EU initiatives.

Activity: Learning from Mission Soil LLs

- Description: The goal of this activity is to transfer knowledge created by Mission Soil Living Labs to BIOservicES experimental sites. These can be for example, trainings provided by the LL projects, webinars on specific theme, and/or online networking sessions. Therefore, tools and educational material created by these projects will be shared and

discussed with experimental sites to support the potential implementation of such tools and materials when appropriate. This learning co-creation activity will be conducted following a collaborative setting. Experimental sites will be encouraged to participate in SOILL Community activities related to Living Labs.

- Objective / expected outcomes: To support the external collaboration opportunities, knowledge exchange, links with LLs, and active participation on SOILL Community activities.

5 Limitations & strategies to implement the co-creation activities

Engaging stakeholders remains a challenge across European projects and soil health initiatives. The existing limitations such as language barriers, different interests, and limited stakeholder availability, reduce the potential impact projects could have. To increase projects benefits, both for society and for scientific progress, it is important to define a co-creation strategy at the starting of the projects, including a plan to tackle expected limitations. Such is the relevance of this topic, that representatives of Mission Soil projects, including BIOservicES, have joined forces to share knowledge and experiences as part of the Mission Soil Stakeholder Engagement and Communication Cluster.

When designing the BIOservicES co-creation strategy, some potential limitations have been identified, as well as strategies to overcome them (table 8).

Table 8: Limitations and strategies to implement the co-creation strategy.

Limitations	Strategies to overcome them
Co-creation activities imply the need for mutual understanding between researchers, practitioners, and local stakeholders. The use of scientific jargon and different communicating forms can create challenges.	**Mutual understanding:** Avoid the use of scientific jargon when communicating with stakeholders. A suggestion is to create different materials adapted to the target audience.
There is a large diversity between the BIOservicES experimental sites, with different needs and strengths, as well as different type of stakeholders involved. While some might have experience participating in scientific projects, with Living Labs, and/or co-creation activities, others are not familiarised yet.	**Contextualise co-creation activities:** BIOservicES acknowledges the complexity of integrating new concepts such as "Living Labs" among different land users and managers´ daily lives. This is why, the co-creation strategy will establish specific activities that could connect these concepts to local needs, challenges, and

	opportunities, so that meaningful and effective collaborations can occur.
Some of the challenges related to implementing the activities could be the use of non-local language and/or technological barriers.	**Good practices for activities´ implementation:** The Soil Community platform will be used to conduct the activities. A session (included in the co-creation strategy) to support stakeholders in the use of the platform will be organised, ensuring that participants can actively engage in all co-creation activities that take place in the platform. When translation to the local language is needed, the experimental site coordinators and/or other project partners knowledgeable of the local language can assist with translating.
A project consortium is usually constituted by partners from different countries, entities, and expertise. Coordinating different activities and priorities across various tasks to which partners need to contribute, can be challenging.	**Time management & coordination** For the coordination of all the activities (including planning and implementation), to schedule recurrent (i.e., bimonthly) meetings with experimental site coordinators is recommended. These meetings can be aligned with the WP1 (task 1.3) recurrent meetings. The purpose of these meetings is to facilitate the coordination of agendas and the implementation of co-creation activities.

6 Conclusions & next steps

The co-creation strategy presented in this document sets out the first steps to be taken for the experimental sites to start collaborating with key stakeholders within BIOservicES but also among the Mission Soil network to establish the basis for co-design, co-creation and co-learning of new initiatives linked to Mission Soil LLs.

As a next step, WP1 partners will in collaboration with experimental sites further contextualise the activities and plan the best timing and approach for conducting them. Acknowledging the complexity of integrating new concepts such as “Living Labs” among different land users and managers´ daily lives, the specific activities would connect these concepts to local needs, challenges, and opportunities, so that meaningful and effective collaborations can occur. This co-creation strategy will be updated yearly to reflect experimental site progress and updates on Mission Soil LLs.

In parallel, BIOservicES will continue following the Mission Soil progress and establishing collaboration bridges with Mission Soil EU projects. The online platform will facilitate these interactions and promote the exchange of knowledge and practices on soil health matters.

7 Appendix A: Survey

Identifying Synergies for Soil Health

This survey serves to investigate the strengths and needs of BIOservicES experimental sites.

* Obligatorio

1. Name of the experimental site *

Escriba su respuesta

2. From the following, which are the strengths of your experimental site? *

- [ ] Knowledge (data, technical expertise, experience in previous projects, living labs management)
- [ ] Collaboration/ networks
- [ ] Running pilots
- [ ] Resources (e.g. technology, modelling tools, monitoring system)
- [ ] Funding / market positioning
- [ ] Recognition / regional awareness

3. From the following, which are the needs of your experimental site? *

- [ ] Knowledge (data, technical expertise, experience in previous projects, living labs management)
- [ ] Collaboration/ networks
- [ ] Running pilots
- [ ] Resources (e.g. technology, modelling tools, monitoring system)
- [ ] Funding / market positioning
- [ ] Recognition / regional awareness

4. How mature is your experimental site in the following aspects? *

	Not done and not our current focus	Not done but interested in working on it	Done but need improvement/ update	Done and updated
Best practices identified	◯	◯	◯	◯
Opportunities and challenges identified	◯	◯	◯	◯
Stakeholders network (e.g. workshops conducted)	◯	◯	◯	◯
Experience/contact with Living Labs or Light Houses	◯	◯	◯	◯
Defining sustainable business models	◯	◯	◯	◯
Soil Health incentives identified	◯	◯	◯	◯

5. Could you please elaborate on the aspects (from question 4) that your experimental site has done? E.g. Which are the identified best practices? How does your experimental site interact with networks?

Escriba su respuesta

6. Does your experimental site have experience addressing any specific soil challenge? Please elaborate:

Escriba su respuesta

7. From the following funding opportunities, which are interesting for your experimetal site? *

- [ ] Access to cascade funding (e.g. from LL projects)
- [ ] Collaborate in LL project proposals
- [ ] Implementing sustainable business models
- [ ] Implementing soil health incentives

8. Our experimental site has interest in collaborating with experimental sites/ Living Labs working on the following soil types: *

- [ ] (Peri) urban
- [ ] Agriculture
- [ ] Natural
- [ ] Forestry
- [ ] No specific interest

9. Which Mission Soil Goals does your experimental site align with? *

- [ ] 1. Reduce desertification
- [ ] 2. Conserve soil organic carbon stocks
- [ ] 3. Stop soil sealing and increase re-use of urban soils
- [ ] 4. Reduce soil pollution and enhance restoration
- [ ] 5. Prevent erosion
- [ ] 6. Improve soil structure to enhance soil biodiversity
- [ ] 7. Reduce the EU global footprint on soils
- [ ] 8. Improve soil literacy in society

10. Would you like to add some additional information?

Escriba su respuesta