

D5.2 Exploitation Roadmap and IPR Strategy

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Summary

Effectively generating impact from results within a Horizon Europe project requires a clear strategy that can be easily adopted by the project beneficiaries, but which is simultaneously flexible enough to adapt to the needs of the results as they become available throughout the project's lifetime. At the core of the SoilValues project lie its testing grounds and communities of practice, where soil health business models are developed and/or implemented. SoilValues' goal is to support land managers in (working towards) operationalizing these soil health business models during the project lifetime, and to ensure they are sustained beyond project end. The latter will be achieved through scaling efforts of the soil health business models, and will rely heavily on exploitation efforts carried out during the project's lifetime. To support this and other SoilValues impacts, the current deliverable outlines the project's exploitation strategy in the form of a **SoilValues Exploitation Roadmap**.

The SoilValues Exploitation Roadmap presents three stages of exploitation related to the phases of the project and results generation. **Stage 1**, the proposal-writing phase of the project, focusses on exploitation activities of anticipated project results. **Stage 2**, the project implementation phase of the project, sees the generation of results during the project lifetime and focusses on adapting anticipated exploitation activities from Stage 1, as well as identifying novel exploitation opportunities, in response to the generated results. Finally, **Stage 3**, the end-of-project phase, centres around structuring the long-term engagement of the project beneficiaries to ensure exploitation activities continue in the four years following project end (and beyond). Each stage in the SoilValues Exploitation Roadmap contains information on the expectations of project beneficiaries regarding their exploitation activities within the SoilValues project, as well as practical guidelines and references to Horizon Europe sources to facilitate this process. Within the SoilValues Exploitation Roadmap, intellectual property (IP) is treated as a potential tool for exploitation. Considering the legal framework surrounding IP generation and management, each stage of the Roadmap contains a dedicated section for IP and intellectual property rights (IPR) management.

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Acronyms and abbreviations

CoP	Community of practice
CRCF	Carbon Removal Certification Framework
EC	European Commission
EU	European Union
KPI	Key performance indicator
PEFCRs	Product Environmental Footprint Category Rules
SEO	search engine optimization
SES	Soil-based ecosystem services
SHBM	Soil health business model
TG	Testing ground
MRV	Monitoring, reporting and verification
WP	Work package

Project consortium

No.	Participant organisation name	Country
1	Katholieke Universiteit Leuven (KU Leuven)	BE
2	Eigen Vermogen van het Instituut voor Landbouw- en Visserijonderzoek (EV ILVO)	BE
3	Stichting Wageningen Research (WR)	NL
4	Wageningen University (WU)	NL
5	European Landowners' Organization (ELO)	BE
6	Consultoria Agroindustrial (CONSULAI)	PT
7	Aarhus Universitet (AU)	DK
8	KOIS Invest (KOIS)	BE
9	MR F&A Consult (MFRA)	BE
10	Instytut Rozwoju Wsi i Rolnictwa Poska Akademia Nauk (IrWiR PAN)	PL
11	Thuenen Institut (THUENEN)	DE
12	Udruzenje Eko-Inovacija na Balkanu (ABE)	RS
13	Institute Navarro de Technologias e Infraestructuras Agroalimentarias (INTIA)	ES
14	Lietuvos Misko ir Zemes Savininku Asociacija (FOAL)	LT

Overview of the SoilValues project

SoilValues: Enhancing Soil health through Values-based business models (HORIZON-MISS-2021-SOIL02-05)

Project duration: 1 January 2023 – 31 December 2026 (48 months)

Total project budget: € 4 999 922.50

EU Grant: € 4 999 922.50

Land managers combine man-made resources with natural resources to produce marketable products like food, feed, fiber and wood, but at the same time produce ecosystem services that are generally not marketed or compensated. However, land managers generally have little incentive to invest in healthy soils, as they cannot sufficiently capture the value generated by these ecosystem services. SoilValues aims to contribute to the conditions for developing successful soil health business models. These are models in which land managers make production decisions that result in higher levels of soil-based ecosystem services (SES) and in which they are paid for the non-marketed services they generate. In order for such business models to function, three important conditions need to be fulfilled: (1) the outcomes of SES need to be measured, thus requiring knowledge, indicators and models, (2) the data and information generated by these indicators and models need to be exchanged to facilitate monitoring, reporting and verification (MRV), and (3) all these activities should be governed by an appropriate institutional framework consisting of the necessary legislation, standards and incentive schemes. To enhance the conditions for developing successful soil health business models, SoilValues will: (1) provide a comprehensive assessment framework addressing all factors influencing the development of business models for investing in soil health, (2) establish 6 testing grounds across Europe to test and improve emerging and designing new soil health business models, (3) establish 12 communities of practice of land managers, value chain actors, investors and public authorities for soil health business models, (4) design a comprehensive toolbox of incentives and policy recommendations to facilitate soil health business models and (5) raise awareness and exchange knowledge for soil health business models. This work is structured along five distinct work packages (WPs) as indicated in Figure 1.

1 Introduction

Horizon Europe is putting more emphasis on strategic actions to increase the impact of its projects. This is reflected in the introduction of the **pathways-to-impact** concept aimed at monitoring and capturing the measurable effects of EU-funded R&I endeavours in the long-run. The pathways-to-impact do so by setting up steps towards achieving the expected impact of the project over time. To this end, Horizon Europe distinguishes between results, outcomes, and impact. **Results** are defined as achievements made during or shortly after the project implementation. **Outcomes** are the effects of the project in the medium term, achieved through the uptake, diffusion, and use of the results. **Impacts** are the effects on society, the economy, and science in the long term, enabled by the outcomes of the project (European Innovation Council and SMEs Executive Agency, 2022). A pathway begins with the project's results, continues with their communication, dissemination, and exploitation leading to expected outcomes, and ends with wider scientific, economic, and societal project impacts which can be facilitated by intellectual property (IP) generation.

Communication, dissemination and exploitation activities are all related activities geared towards generating impact from project results (Figure 1). **Communication** serves to inform about, and promote, a project and its results to a wider audience in a non-technical manner. **Dissemination** serves to transfer knowledge and results generated within a project, ensuring the results are available for use and reuse. Target audiences here are end-users or other people with the ability to use the results. **Exploitation** focusses on facilitating the use and reuse of results aiming to turn project outcomes into concrete value and impact to society (European Innovation Council and SMEs Executive Agency, 2022b). Exploitation activities target people and/or organisations that can make concrete use of the generated results, both within and outside the project itself. Various use cases exist, including (i) use in further research activities (outside the project), (ii) developing, creating, marketing or improving a product or process, (iii) creating and providing a process or service, and (iv) using results in standardisation activities or other use scenarios such as to inform policy or for educational purposes.

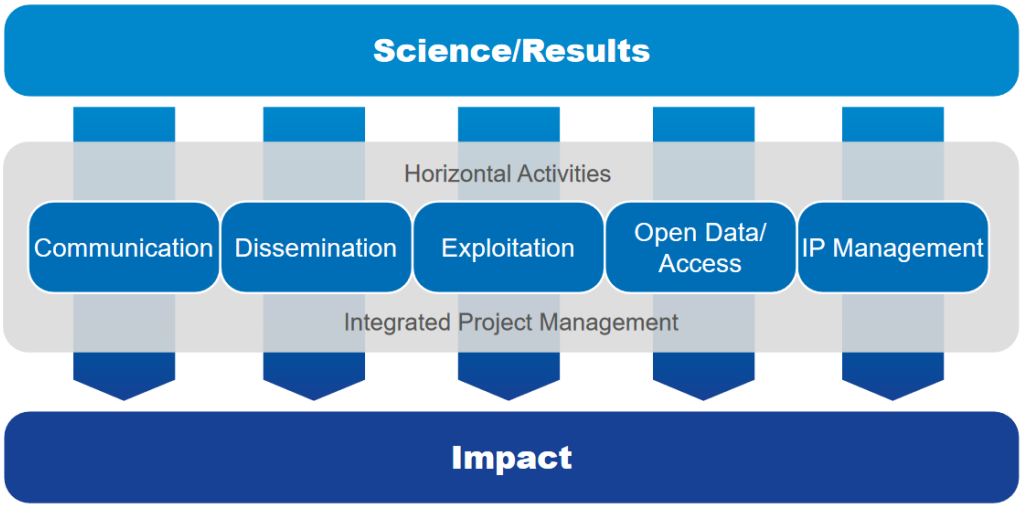


Figure 1. Horizon Europe integrated approach to generating impact from results through communication, dissemination and exploitation (European Innovation Council and SMEs Executive Agency, 2022).

Effectively generating impact from results within a Horizon Europe project requires a clear strategy that can be easily adopted by the project beneficiaries, but which is simultaneously flexible enough to adapt to the needs of the results as they become available throughout the project's lifetime. SoilValues Deliverables D5.1 and D5.7 (Dissemination and Exploitation Plan first version and update 1) outline in detail the project's communication and dissemination strategies. In this current deliverable we specifically outline the project's exploitation strategy in the form of a **SoilValues Exploitation Roadmap**.

The SoilValues Exploitation Roadmap presents three stages of exploitation related to the phases of the project and results generation. **Stage 1**, the proposal-writing phase of the project, focusses on exploitation activities of anticipated project results. **Stage 2**, the project implementation phase of the project, sees the generation of results during the project lifetime and focusses on adapting anticipated exploitation activities from Stage 1, as well as identifying novel exploitation opportunities, in response to the generated results. Finally, **Stage 3**, the end-of-project phase, centres around structuring the long-term engagement of the project beneficiaries to ensure exploitation activities continue in the four years following project end (and beyond). Each stage in the SoilValues Exploitation Roadmap contains information on the expectations of project beneficiaries regarding their exploitation activities within the SoilValues project, as well as practical guidelines and references to Horizon Europe sources to facilitate this process. Within the SoilValues Exploitation Roadmap, intellectual property (IP) is treated as a potential tool for exploitation. Considering the legal framework surrounding IP generation and management, each stage of the Roadmap contains a dedicated section for IP and intellectual property rights (IPR) management.

2 Scaling strategy

At the core of the SoilValues project lie its testing grounds (TGs) and communities of practice (CoPs), where soil health business models (SHBMs) are developed and/or implemented. SoilValues' goal is to support land managers and the up- and downstream actors in the food value chain in (working towards) operationalizing these SHBMs during the project lifetime, and to ensure they are sustained beyond project end. Underpinning both components of this goal is the scaling of the SHBMs, which itself will rely heavily on exploitation efforts carried out during the project's lifetime.

Lam et al. (2020) proposed a typology of eight scaling approaches (Lam et al., 2020). A first set of two processes aims to amplify an existing innovation, either by prolonging its existence (stabilization) or speeding it up. A second set of processes aims to expand the reach of the innovation to more people and places, which can be referred to as **scaling out**. This is what is mainly meant with scaling up as it is referred to in in the Mission Soil's second operational objective; to "co-create and upscale place-based innovations to improve soil health in all places". A further subdivision refers to two dimensions, namely (1) the dependency of the amplification to the existing innovation (dependent versus independent) and (2) similarity of the context to which the innovation is scaled out. This results in four types of scaling out:

- **Growing** involves expanding the innovation towards similar contexts. This is how many intermediaries work: they develop schemes with a specific set of practices, monitoring, reporting and verification (MRV) systems and rewarding schemes that they then try to expand geographically.
- **Replicating** means expansion into a different context. Often, growing the same innovation does not work because the context does not allow to use the innovation in exactly the same way. For example, MRV schemes have to be adapted to a different national context because of differences in legislation.
- **Transferring** involves implementing the innovation independently from the original idea, but in a similar context. Many bottom-up initiatives operate in this way. For instance, initiatives buying land to lease it to regenerative farmers share the same principles but may work independently from each other. Still, they work in similar contexts, for example with citizens willing to invest.
- **Spreading** means adopting the core principles and approaches of an innovation in a different form and context, such as a context in which citizens' ability to invest is much lower.

A final set of processes aims to expand the impact beyond the innovation either at a higher institutional level (e.g. influencing legislation), which is **scaling up,** or by changing people's values and norms—**scaling deep**, i.e., broadening what impact means beyond economic and environmental impact.

SoilValues' scaling strategy is centred around the CoPs. Specifically, the CoPs aim at further developing and scaling SHBMs tested in TGs in order to be used at a broader scale. They will do this together with WP4 by developing roadmaps or pathways at regional scale that include recommendations for the design and implementation of incentives effectively supporting the scaling of SHBMs. Moreover, the initial six CoPs developed around the six TGs will be supplemented with six more CoPs, three in Germany, Belgium and The Netherlands, and three in Serbia, Spain and Lithuania. In the typology described earlier, scaling within SoilValues primarily means **transferring** and **spreading** innovations. In addition, CoPs will formulate policy recommendations, which is a form of **scaling up,** and in cases where a broader set of values is mobilized in the SHBM, recommendations may facilitate **scaling deep**.

To facilitate the scaling process amongst the CoPs, a central guidebook on designing a CoP with impact has been created. Within this, five phases are outlined. The first three phases relate to setting-up the

CoP(s) during the project's lifetime. Phases four and five address scaling of the CoPs in an effort to sustain their structure after project end. Phase four will conclude with the organization of reflection sessions alongside initiating actions identified in the 'action plan'. These sessions will be centred round lessons learnt, opportunities and struggles, capacities and outputs, and will be organized across different layers of stakeholders within the CoP(s). They will particularly explore communication, dissemination and exploitation strategies to ensure the continuity of the SHBMs beyond project end. During phase five, the CoPs' continuity will be encouraged through meetings aimed at validating SoilValues research findings, informing recommendations for scaling the SHBM, and conducting an impact evaluation of the earlier CoP phases.

3 SoilValues exploitation roadmap

The SoilValues Exploitation Roadmap (Figure 2) describes the exploitation activities as they will take place throughout the project's lifetime. As exploitation serves the adoption of underlying results, this roadmap is dynamic, meaning it is subject to change as results become available. Divided across the phases of the project's lifetime, the roadmap consists of three stages:

1. The proposal-writing stage prior to project start, which involves the exploration of opportunities for exploitation based on the anticipated results.
2. The implementation stage of the project, which involves active exploitation activities taking place based on the results achieved during the project lifetime.
3. The end-of-project stage, which involves setting up a procedure to ensure results remain exploited beyond project-end. All SoilValues partners are contractually obliged via the GA to use their best efforts to exploit their results directly or to have them exploited by another entity for up to four years after project end.

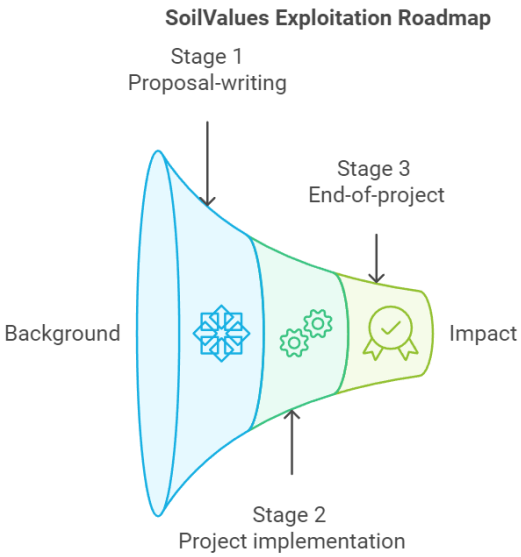


Figure 2. SoilValues Exploitation Roadmap

Using the instruments developed for the communication and dissemination activities (summarised in deliverables D5.1 and D5.7), results will be exploited within and outside of the SoilValues project.

IP as a tool for exploitation

IP forms an essential part of the exploitation strategy within SoilValues. Successful commercialization of results relies essentially on **IPR** already present within the consortium and new IP generated during the

project. SoilValues beneficiaries are required by the Grant Agreement (GA) to adequately protect their results if protection is possible and justified, taking into account all relevant considerations, including the prospects for commercial exploitation, the legitimate interests of the other beneficiaries and any other legitimate interests. One approach to protecting SoilValues results is through the generation of IP. Proper IP management, however, requires a clear management strategy and IPR rules. While IP refers to the protection knowledge through legal frameworks, IPR refers to the protection of said IP and the rights of use each partner enjoys for their own IP (Executive Agency for Small and Medium sized Enterprises, 2020).

The consortium will protect, share, manage and exploit IP generated to achieve maximum outreach, engagement, impact and benefit. The IPR will be managed according to the best international standards and best practices will be in absolute accordance with those set out in the European Charter for Researchers. Traceability and recognition of Background and Foreground IP will be handled throughout the project via the Coordinator and the DMP. The Consortium Agreement (CA) and the Grant Agreement (GA) define the IPR rules relating to all IP generated within the SoilValues project. While the current deliverable summarises some of these rules, project partners are directed to the CA and the GA for more detailed information.

Addressing the IP management strategy at the onset of the project is important to create an environment which guarantees IPR are respected, approached uniformly by all SoilValues beneficiaries and monitored permanently throughout the course of the project. To this end, IP is managed through a dynamic and flexible process collaboratively with all project beneficiaries throughout the project's lifetime. The overall IP management strategy objective is to describe the basic elements of the formal IP management system for SoilValues. This should facilitate the capture, assessment and protection of exploitable results within the project in order to support commercial exploitation at an individual beneficiary level, as a group of beneficiaries, or collectively for the consortium as a whole. The IP strategy formalizes the generated knowledge and creativity as well as the subsequent protection of IP-related work, including all beneficiaries' down streaming activities related to IPR handling. This formalisation helps to protect, strengthen and widen the project's possibilities with the licensing of innovations and other types of market exploitation strategies. The IP vision adopted by the consortium satisfies multiple IPR objectives and the wider Horizon Europe goals to valorise knowledge and research results generated through EU funding, balancing the need to protect and later commercialise IP assets, the wish to license as many research outcomes as possible for public use, and getting widespread adoption of the open standards.

Stage 1: Proposal-writing

During proposal-writing, exploitation activities mainly focus on identifying opportunities for exploitation based on anticipated project results. A wide range of activities can be carried out for exploitation; though successful is rooted in identifying the activity best suited to achieve the exploitation objective. This requires first to identify opportunities for exploitation, defining the purpose of the exploitation activity and who is addressed by it, to then identify the tool and carry out the activity that will optimally convey the desired message (European Innovation Council and SMEs Executive Agency, 2022). For example, IP and IPR is an exploitation tool used to specifically support commercial exploitation of project results (European Innovation Council and SMEs Executive Agency, 2022).

The SoilValues consortium is united behind the project's objective to support land managers in improving soil health in the EU. Within the project, however, each beneficiary has their own objectives – as is demonstrated by the different topical work packages (WPs) and the beneficiaries involved in each. The opportunities for exploitation of the SoilValues results depend therefore not only on the results themselves, but also on the exploitation objectives of the beneficiaries who own the results. The SoilValues consortium is made up of a rich variety of beneficiary types, from scientific partners to sector

associated partners. This makes for a strong basis upon which to generate impact across the many stakeholders engaged in soil health improvement in the EU. Not all exploitation activities will be equally relevant for all beneficiary types. For example, participating land managers may not seek to exploit scientific knowledge through peer-reviewed articles but instead seek to extend their own, and other land manager's, practical knowledge on soil health-improving business models. When identifying exploitation opportunities and associated tools, considering each beneficiary's objectives is important. Table 1 summarises the beneficiary types within the SoilValues consortium and their associated exploitation objectives.

Table 1. Table 2.5 from the GA: Summary of the exploitation objectives of the SoilValues beneficiaries by type

Scientific Partners	Expand scientific knowledge on incentives and business models for ecosystem services, the regenerative agricultural practices used, the modelling of impact on economics and behaviour at farm level, on the generation of co-benefits
National CoPs	Expand practical knowledge on incentives and business models for ecosystem services, the regenerative agricultural practices used, the impact on economic behavioural aspects at farm level, the generation of co-benefits, etc. Expand knowledge on organising farmers and other end users in CoPs (whether or not as producer organisation). Grow their stakeholder network.
Participating land managers	Expand their practical knowledge on incentives and business models for ecosystem services, the regenerative agricultural practices used, the economic behavioural impact, the generation of co-benefits at their farm and forestry business. Expand knowledge on CoPs.
Upstream and downstream food chain actors including intermediaries such advisory companies, the financial and insurance sectors, agrifood partners	Demonstrate that the implementation of incentives and business models for ecosystem services scheme is feasible from a technical as well as an economic point of view.
Sector associations	Reinforce their credibility vis-à-vis policy makers by demonstrating that they are responding to the new policy instruments being offered by the European Commission (EC).

Departing from the SoilValues objectives and pathway-to-impact, further incorporating the specific objectives of the various SoilValues beneficiaries, the consortium anticipating a number of exploitation opportunities during the proposal-writing phase of the project, formalized as the following expected outcomes (EO) and wider impacts (WI):

- EO1. Increased awareness about the value of investing in soil health and its various co-benefits for land managers, upstream and downstream food chain actors (incl. intermediaries such as advisory companies, the financial and insurance sector, etc…), local authorities and civil society.
- EO2. Increased opportunities for investments in soil health across value chains.
- EO3. Novel opportunities for developing and diversifying income for land managers.
- EO4. Enhanced cooperation and new partnerships across different sectors to significantly improve soil health and support the manifold soil functions.
- EO5. Emergence of new value chains and products based on sustainable soil practices allowing consumers to make more informed decisions.

- **WI1.** "Soil literacy", awareness and societal appreciation of the vital functions of soils are significantly increased and result in wide societal engagement on soil health.
- **WI2.** The links between healthy soils, nutritious and safe food and a healthy environment are better understood.
- **WI3.** Land managers, upstream and downstream food chain partners including intermediaries, consumers and society at large work together and take effective action on soil health across sectors and land uses, as informed by best available science, thereby significantly alleviating not only the immediate pressure on soils but also on the surrounding environment including water bodies.
- **WI4.** Robust soil monitoring programmes and common definitions are in place (based on common, harmonised and comprehensive measurements) and allow land managers and public authorities to take effective actions based on up-to-date information from all Member States and Associated Countries.
- **WI5.** The successful implementation of the mission supports several EU policy and international commitments, e.g. in relation to land degradation neutrality, food and nutrition security, climate biodiversity (e.g. SDGs, UNCCD, UN CBD, Green Deal including the Farm to Fork Strategy, Biodiversity Strategy, new Soil Strategy, Zero Pollution Strategy, Forest Strategy or the Long-term Vision for Rural Areas).

The project Coordinator as well as the SoilValues beneficiaries are expected to regularly consult the above-included list during Stage 2 of the SoilValues Exploitation Roadmap in order to translate the anticipated exploitation opportunities into active exploitation activities. Prior to doing this, however, the intended end-user should be identified to target the exploitation activity to their respective needs. Table 3 lists the SoilValues stakeholders as described in the GA and identifies potential exploitation tools most suited to targeting each as an exploitation end-user.

Table 2. SoilValues stakeholders and targeted exploitation tools

Stakeholders/end-users	Relevant exploitation tools
General public and media	Media campaigns; project videos; copyright; awareness raising; advocacy; testimonials
Citizens and media interested in sustainability and agrifood innovation	Media campaigns; project videos; copyright; awareness raising; advocacy; testimonials
Researchers, students, PhD graduates, academics	Open-source scientific articles; empirical models; open-source databases; (theoretical) frameworks
Operators active in and outside the food chain (agrifood suppliers, farmers/land managers, processors and food producers, retailers) and intermediaries	(Theoretical) frameworks; project videos; SoilValues ambassadorship; know-how; consultancy services; guidance; advocacy; testimonials; trade secrets; patenting; licensing; IP and IPR
Project partners and participants	Project videos; open-source databases; patenting; licensing; IP and IPR; know-how
EU Commission and other relevant projects	(Theoretical) frameworks; policy recommendation; empirical models; open-source databases

IP and IPR in Stage 1

At each stage of a project, the IP issues to be addressed are different. During stage 1 it is important to agree which existing knowledge is to be shared, and under what terms and conditions – both for use

during the project (Stage 2) and after it ends (Stage 3) (European Innovation Council and SMEs Executive Agency, 2022). The SoilValues project builds and relies upon pre-existing IP – called background – belonging to the beneficiaries. Background is defined according to the GA as "data, know-how, or information that is needed to implement the action or exploit results".

Upon signature of the CA by all beneficiaries, an internal audit was performed to clearly identify background IP (e.g., patents, know-how, software,…), to evaluate opportunities and risks of sharing knowledge between beneficiaries, and to check which Horizon Europe IP rules are relevant for the project and its expected impacts. A first review of the freedom-to-operate revealed no background IP was held by third parties. Table 4 describes the background identified during stage 1, as summarised in Annex 1 of the SoilValues CA. Very little background was identified during stage 1; with the exception of partner 3 (WR) and 4 (WU), no partners identified any background relevant to SoilValues expected results. With the exception of IP building on the background of partners 3 and 4, most IP generated during SoilValues will thus be novel.

Table 3. SoilValues background per project partner as summarised in Annex 1 of the Consortium Agreement

Partner #	Partner name	Background
1	KU Leuven	None
2	EV ILVO	None
3	WR	National FADN data and Smart Land Use (Slim Landgebruik) data
4	WU	Set of models, which calculate the Economic Value of the Land taking into account (1) cropping plan optimization in function of (2) soil demands and restrictions, (3) soil and crop management and (4) requirements to meet eco-systems services (in the broadest sense, including model descriptions, methodology, generic models) which are not yet published
5	ELO	None
6	CONSULAI	None
7	AU	None
8	KOIS	None
9	MRF&A	None
10	IRWiR PAN	None
11	THUENEN	None
12	ABE	None
13	INTIA	None
14	FOAL	None

Stage 1 of the SoilValues Exploitation Roadmap also sees the establishment of clear guidelines and upfront agreements on IP and licensing. To this end the IPR have been discussed in detail during the proposal-writing stage and have been summarised in the CA and GA. Specifically, beneficiaries are expected to co-operate about the preparation and prosecution of patent applications and any other resulting IPR applications, with regard to any legal proceedings, concerning such patents and patent applications and any other resulting IPR applications. Each partner shall own the resulting IPR generated by it under the project and shall be responsible for securing ownership of such resulting IPR from its employees, students and other agents.

Stage 2: Active exploitation during project implementation

As the project progresses, results become available. Here, the SoilValues Exploitation Roadmap (Table 4) ensures results are closely captured, monitored and managed as they are being generated. This may

also help identify possible outcomes that were not foreseen in the preceding phase of the project. During the project's lifetime, market needs or interests of potential stakeholders may change, results that were not foreseen in Stage 1 can develop, or any other number of unknown variables can come up, that require a close review and regular updates/adjustments of the plans for exploitation.

To capture the exploitation activities associated with the generated results, a **SoilValues Exploitation Repository** has been created. This repository is to be updated by the project beneficiaries continuously throughout the project's lifetime each time results are generated. The repository utilises the excel document that was created to track outreach activities (described in deliverable D5.7), as beneficiaries established familiarity with the set-up is expected to increase up-take. The current excel already includes a tab for outreach ('Outreach activities') and a tab to announce publication intentions ('Planned publication'). To incorporate the SoilValues Exploitation Repository, a third tab has been added titled 'Exploitation Repository'. Table 4 outlines the information captured in the Exploitation Repository. A first overview anticipated exploitation activities following the Exploitation Repository format is included Appendix B. This excel document housing the Exploitation Repository is a dynamic document, growing in scope as the project progresses. As such, the name of the document has been changed to better suit its current purpose. Previous titled 'SoilValues Outreach.xlsx', the document has been renamed to 'SoilValues Knowledge Management Repository.xlsx'. Different tabs of the document now reflect the different components of knowledge management as described by Horizon Europe and shown in Figure 1[1].

The establishment of the SoilValues Exploitation Repository allows for a clear and structured approach to capturing exploitation opportunities as they arise. This structure allows us to optimize exploitation activities as a project as it facilitates the identification of a target audience (necessary to select the right exploitation tool), as well as leveraging opportunities for joint exploitation between beneficiaries. Beneficiaries can easily consult the exploitation activities of others, evaluate the overlap with their own results and thus identify potential for joint exploitation opportunities.

To establish the baseline for this first iteration of the SoilValues Exploitation Repository, each SoilValues beneficiary was asked to reflect on their ongoing and upcoming exploitation activities. The SoilValues Exploitation Repository has been structured along the key elements of successful exploitation identified by the EC, namely:

1. Define the **purpose of the exploitation** measure. Relevant questions here include "who should you tell", "why are you telling them", and "what message will you deliver".
2. Identify **the end-user(s)**. Potential end-users have been listed in Table 3.
3. Identify **the right tool**. Informed by the purpose of the exploitation measure as well as the target audience, the right exploitation tool can ensure swift and effective uptake of project results. Potential tools include **patenting**, **licensing**, **consultancy services**, **copyright**, **software development**, **know-how**, and **trade secrets**. Patenting, licensing, copyright and software developed are IP-related exploitation tools. More information on IP management during Stage 2 exploitation is described in Section 2.2.1. Relevant questions to consider when identifying the right exploitation tool include "how will you deliver the message?" and "how will you follow up any response?"

[1] This adjustment to the existing document will also be reported in Deliverable D5.9 Dissemination and Exploitation Plan – update 3.

Table 4. Information captured in the SoilValues Exploitation Repository

Exploitation activity number	#
Result name	Provide a one-sentence title for the result
Result type	Indicate whether this result is process-based or deliverable-based
Description of result	Briefly describe the result, including its key components, the nature of its innovation and its relevance to policy (at the local, regional, national and/or EU-level)
Related WP	Indicate related WP number (WP1, 2, 3, 4, 5 or 6)
Related task	Indicate the task as described in the GA to which the result relates
Related EO/WI	Indicate the expected outcome (EO) and/or wider impact (WI) related to the generated result. Multiple EOs and/or WIs can relate to a single result
Single or joint ownership of result	Indicate the number of owners (1,...,N)
Owner(s) name	Name of all partners who own the result as mentioned in the GA
Owner(s) country of establishment	Country of establishment for all partners who are owner of the IP
Results will be exploited by owner(s)?	Yes; no
Anticipated exploitation strategy	Patenting; licensing; consultancy services; copyright; software development; know-how; trade secrets; policy recommendations;... A single exploitation strategy may relate to multiple results
IP?	Yes; no
IP ownership	Who will own the IP? If multiple owners, list all owning parties.
Expected time to impact	When do you expect the result to be exploited or used?
Exploitation audience or target group	General public & media; citizens & media interested in sustainability and agrifood innovation; researchers, students, PhD graduates, academics; Operators active in and outside the food chain; Project partners and participants; EU Commission and other relevant projects

Concretely, exploitation can be achieved through various activities and tools. Next to the list of activities and tools listed as examples in Table 3, Horizon Europe provides various free-of-charge exploitation services including:

- The Open research Europe platform. An open access publishing platform for scientific papers for Horizon Europe beneficiaries, including an open peer review and article revision.
- The Horizon Results Platform. A platform showcasing project research results, facilitating collaboration opportunities and inspirations amongst Horizon EC projects.
- The Horizon Results Booster. A free consulting service including a portfolio dissemination and exploitation strategy, business plan development and go-to-market support. Together with the EC projects MRV4SOC, SoildiverAgro, NOVASOIL, InBestSoil, and BIOservicES, SoilValues has engaged with the Horizon Results Booster as a Project Group to formulate joint communication and dissemination campaigns. This is described in more detail below in Section 4.
- The Horizon Standardisation Booster. A dedicated support service for Horizon Europe to increase and valorise project results through standardisation.

- Invitation radar. An initiative that strengthens connections between EU-funded innovators, European investors, and policymakers to help high-potential innovations reach market.

IP and IPR in Stage 2

Following the guidelines established by Horizon Europe, each Horizon Europe beneficiary is expected to use its best efforts to exploit the results it owns. To do so, beneficiaries are required to adequately protect their results – if possible and justified – taking account of possible prospects for commercial exploitation and any other legitimate interests. For this we have included an IP branch to the exploitation repository described in Section 2.2 capturing IP-specific information (Table 4). Similarly to the exploitation branch, the IP branch of the exploitation repository is dynamic and should be updated by partners throughout the project as needed.

Using this dynamic exploitation repository, each partner is expected to promptly disclose to the other partners all resulting IP during the term of the project CA. Partners shall co-operate about the preparation and prosecution of patent applications and any other resulting IPR applications, with regards to any legal proceedings, concerning such patents and patent applications and any other resulting IPR applications. Each partner shall own the resulting IP generated by it under the project and shall be responsible for securing ownership of such resulting IP from its employees, students and other agents.

To establish the baseline IP, each SoilValues beneficiary was also asked to reflect on the IP generated by them during the project. For each IP item anticipated, the project partner was asked to provide the following information:

- IP Ownership: In anticipation of the reporting of the mandatory Result Ownership List (ROL) in the final project reporting (M48) an overview of IP ownership is to be included. This includes the ownership type (single or joint), the name of the owner(s), the country of establishment of the owner(s) and whether the results will be exploited by the owner(s). Results generated in SoilValues are owned by the beneficiaries that generate them. Two or more beneficiaries may jointly own results and IP if they have both jointly generated them. Joint owners must agree – in writing – on the allocation and terms of exercise of their joint ownership. This is referred to as a joint ownership agreement. Each joint owner may grant non-exclusive licenses to third parties to exploit the jointly-owned results (without any right to sub-license) if the other joint owners are given at least 45 days advance notice, and a fair and reasonable compensation. More information on ownership of results can be found in Annex 5 of the GA.
- Target exploitation group: The end-users who will utilise the generated IP. This can include the EC, CoPs, agro-food operators, research community, authorities, and/or the general public to name a few.
- IP protection method(s): The method used to legally protect the generated IP. The most appropriate IP protection method will depend on the type of IP generated and its target exploitation group. This can include patents, licenses, copyright, and software development. Where relevant, each partner is to identify the protection method(s) most suitable for their IP in consultation with their in-house legal departments. Open communication should be maintained with the SoilValues project coordinator during this process.
- Time to market: Producing and protecting IP is often not achieved during the project lifecycle. It may occur that IP related to the SoilValues project is only generated after project end. For this, each partner is given one year after project end to publish any IP. Section 2.3 describes the process of IP management after project end.

When generating new IP, partners are expected to protect the IP foreground accordingly to ensure a competitive advantage to address the commercialisation of project results. IP protection tools must be selected in accordance with the other partners' legitimate interests and with future use in case exploitation on further research is anticipated. All project partners must inform other partners about any IP protection plans, particularly when dealing with joint ownership. A number of IP protection tools exist, the most appropriate of which is determined on a case-by-case basis:

Formal IP Protection Tools

Formal IP Protection tools include patents, designs, copyright, and trademarks. When considering implementing a patent to protect IP generated within SoilValues, partners are recommended to consult common patent repositories such as WIPO, EPO and Google Patents to evaluate the compatibility of any new IP. This is useful for:

- Identifying any barriers to patenting or licensing that may require an adjusted IP strategy definition
- Assessing whether the right(s) of a third party are being infringed on
- Assessing whether a third party is not in a position of infringing on a partners' rights

Contractual Knowledge Protection Tools

Contractual knowledge protection tools are contractual agreements signed between parties outlining the protection, management and exploitation of IP. Contractual protection tools generally include clauses describing the relationship between the parties involved (recitals), a description of each party, important definitions needed to facilitate contractual coherence, the purpose of the contract and the main obligations to be performed by each party, the duration of the contract, the price and the payment method, issues related to subcontracting, data protection, waivers, warranties and indemnities, governing law, jurisdiction and force majeure (Executive Agency for Small and Medium sized Enterprises, 2020). A valid contract is legally binding, meaning all parties involved have the right to enforce it. Examples of contractual knowledge protection tools include assignment agreements, licence agreements, non-disclosure agreements, technology transfer agreements, R&D agreements, joint venture agreements, software development agreements, consortium agreements and employment agreements.

When applying for IP protection, project partners must include the Horizon Europe funding statement unless the agency requests or agrees otherwise or unless it is impossible:

"Funded by the European Union (EU). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the EU or the European Research Executive Agency (REA). Neither the EU nor the granting authority can be held responsible for them. Grant agreement: 101091308"

Stage 3: Exploitation beyond project end

Project beneficiaries are contractually obliged to use their best efforts to exploit results during four years after project end. This applies to both results generated during the project lifetime as well as those generated after project end. In case of the former, where result ownership has already been established, the ROL submitted during the final reporting will primarily guide exploitation beyond project end. Here, the guidelines described for stage 2 exploitation (described in section 3.4) apply.

Results generated after project end will require an extra effort from project beneficiaries to communicate on the ownership and planned exploitation activities. In a first instance, project

beneficiaries will be required to create an overview of anticipated results and/or exploitation activities after project end. This will be taken up in the agenda of the final consortium meeting as a session during which the consortium must discuss and agree on (joint) exploitation strategies and pathways after project end. At this stage, the SoilValues Exploitation Repository will be updated once more. To facilitate this, the SoilValues collaborative platform (SharePoint) will remain active for at least four years after project end (until December 2030). After project end, project beneficiaries are responsible for amending or completing the SoilValues Exploitation Repository with newly generated results and/or with planned exploitation activities. This must be accompanied by an email communication to the remaining project beneficiaries to indicate the update. Once communicated to the project beneficiaries, ownership must be established and exploitation activities organized following the guidelines described for stage 2 exploitation (described in section 3.4).

IP and IPR in stage 3

Towards the end of the project, as all the expected results become available, planning the future exploitation pathways becomes important. The GA states that "if, despite a beneficiary's best efforts, the results are not exploited within one year after the end of the action, the beneficiaries must (unless otherwise agreed in writing with the granting authority) use the Horizon Results Platform (HRB) to find interested parties to exploit the results". To this end, the final step in the IP strategy is to follow-up on IP and exploitation activities and make these publicly available on the HRP platform if necessary.

During the designated session at the final consortium meeting, each partner expecting to generate IP related to the SoilValues project is required to discuss possible IP ownership arrangements with the relevant parties, identify related responsibilities including the definition of relative contributions of joint-owners, and weigh potential (licensing) agreements and renumeration options if relevant.

4 Risks to exploitation

The SoilValues Exploitation Roadmap aims to make it as easy as possible for beneficiaries to engage in exploitation activities to ensure project impact. Part of this is also identifying potential risks in the exploitation, such that if these come to be faced, beneficiaries are equipped with the right knowledge to overcome them. A number of potential barriers and obstacles to the exploitation of SoilValues results have been identified in the GA. Concretely these can be clustered as risks experienced through forces within the project, forces outside the project, and unforeseen forces.

Forces within the project

- Risk: The willingness of value chain actors to collaborate with land managers.
    - Corrective action: To maximize value chain involvement, the communities of practice will put together land managers, value chain actors, investors and public authorities (and opinion leaders and opinion makers). The CoP Strategic plan was set-up to foster interactions by bridging formal and informal interests and action aspirations. Additionally, leading by example and receiving support from management are crucial motivators in this regard. The presence of all actors from the food chain is a lever to further develop and scale-up the soil health business models. The SoilValues Marketing Plan (included in Appendix B) was also developed to generate a clear SoilValues marketing message, which can serve as a guide to engage a diverse range of value chain actors.
- Risk: Disputes amongst beneficiaries regarding ownership of results and/or IP as well as IPR
    - Corrective action: The SoilValues Exploitation Repository ensures transparency regarding project results, their ownership, and any anticipated IP/IPR coming from these results. The upfront completion of this repository enables partners to explore potential ownership concerns prior to the results/IP being generated, thereby already reducing the potential for conflict. If conflict were to arise, the coordinator will be involved, and relevant bodies within the involved institutions will be consulted in an attempt to resolve any remaining issues.

Forces outside the project

Forces outside the project that could pose a risk to the exploitation of SoilValues results relate primarily to policy.

- Risk: Problems in the integration of carbon schemes into the Product Environmental Footprint Category Rules.
    - Corrective action: The no-harm principle being made mandatory in the carbon removal certification framework implies that any carbon removal activities must ensure they do not cause adverse social, environmental, or economic impacts. However, ensuring adherence to the principle requires robust mechanisms to assess and monitor project impacts over time. The EC, with the support of the Expert Group on the Carbon Removal Certification Framework (CRCF), is working on delegated acts to put robust Monitoring, Reporting, and Verification (MRV) in place. When generating policy recommendations, SoilValues will keep close track of these developments through its ties with the CRCF members.
- Risk: Product Environmental Footprint Category Rules (PEFCRs) of the EU's Environmental Footprint Pilot in the framework of the Single Market for Green Products.

    - **Corrective action:** The Green Claims Directive - part of the EU's regulatory push for greater transparency and accountability in environmental claims - might have significant implications for business models enhancing the value of soil (i.e., enhancing the quality, fertility, and functionality of soil) as businesses will be asked to back their environmental claims with rigorous evidence but also creates an opportunity for those who can demonstrate genuine sustainability contributions.
- **Risk:** Initiative, e.g., due to competition policy: policy recommendations are aimed to streamline legislation across different legal initiatives (policy coherence)
    - **Corrective action:** Conflicting legislation around soil valorisation can create uncertainty for stakeholders, hinder innovation, and limit the adoption of sustainable soil business models. The EU Commission's response involves harmonizing policies and aligning them with a broader new vision for sustainable agriculture which will be presented in January 2025. When generating policy recommendations, SoilValues will keep close track of these developments.
- **Risk:** Legislation differs from country to country, obstructing a level playing field: policy recommendations are aimed to streamline legislation across the EU
    - **Corrective action:** As a general framework remains in place, efforts should continue to reinforce the level playing field through mutual recognition and exchange agreements.

Unforeseen forces

- **Risk:** Global threats such as pandemics and war
    - **Corrective action:** Flexibility, where necessary, should be allowed when planning exploitation activities such that the exploitation may be extended in time and/or commenced in several steps.

5 The SoilValues Marketing Plan

The success of SoilValues is directly related to the (future) uptake of the project's methods by land managers and up- and downstream actors in the food value chain. To facilitate this, the SoilValues Marketing Plan has been established under milestone 15 (included in Appendix B). The marketing activities incorporated in this Marketing Plan include a general introduction into the project (1 video), an introduction into possible methodologies to improve soil health available to them (10 videos), case studies where other land managers are giving testimonials (10 videos), an overview of the projects' realisations (1 video), and a SoilValues Ambassador certificate for all land managers and stakeholders involved in the project through the TGs and the CoPs.

6 Open-source policy

Under Horizon Europe, all beneficiaries are obliged to follow the **Open Science** approach, which focusses on spreading knowledge as soon as it is available using digital and collaborative technology. As such, project partners are expected to make their scientific publications available as Open Access publications, and grant access to their data as open as possible and as closed as necessary (European Innovation Council and SMEs Executive Agency, 2022). However, authors wishing to publish foreground IP must obtain the necessary permission from the owners of the foreground IP before submitting their paper(s) for publication. Specific procedures to follow in this instance have been defined in the CA following the DESCA agreement guidelines.

Next to the SoilValues Zenodo repository where project results can be made open-access, Horizon Europe provides a number of resources which can be used by the SoilValues beneficiaries to comply with the open-source requirements. As described above in Section 3.3, these include the Open research Europe platform, the Horizon Results Platform, and the Invitation radar.

7 Exploitation with other EC projects

SoilValues places great importance on optimizing project impacts through joint communication, dissemination, as well as exploitation activities with other EC projects. To this end, SoilValues has joined the EU projects MRV4SOC, SoildiverAgro, NOVASOIL, InBestSoil, and BIOservicES in the Horizon Results Booster BioCulture Cluster. Within this Cluster, the listed projects form a project group based on the commonalities between our work. Common results, stakeholders and challenges have been identified with the objective to next identify opportunities for joint communication, dissemination, and exploitation activities. Next to this, SoilValues has also joined the SOILL community managed by the SOILL-Startup project.

Finally, together with the sister projects of the call, InBestSoil and NOVASOIL, joint exploitation activities are being planned. First, a joint webinar series is currently being thought-out, in which the three projects, and potentially other relevant Mission Soil projects, will disseminate and exploit results related to a specific pre-determined topic. At the time of writing the current deliverable, the joint webinar series is still in the development phase, but a multi-topic series of short (1-1.5 hour) online webinars running throughout the three project's lifetimes is foreseen. Next to this, SoilValues together with its sister projects is exploring the options to jointly exploit policy recommendations in the form of one or multiple joint policy briefs. This will allow the projects to align recommendations where possible to maximize project impact.

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Appendix A: Legal obligations: Article 39 of the regulations establishing Horizon Europe

The full overview of regulations establishing Horizon Europe can be found here: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32021R0695&from=EN#d1e3434-1-1

Article 39

Exploitation and dissemination

1. Each beneficiary that has received Union funding shall use its best efforts to exploit the results it owns, or to have them exploited by another legal entity. Exploitation may be direct by the beneficiaries or indirect in particular through the transfer and licensing of results in accordance with Article 40.

   The work programme may provide for additional exploitation obligations.

   If, despite a beneficiary's best efforts to exploit its results directly or indirectly, the results are not exploited within a given period as established in the grant agreement, the beneficiary shall use an appropriate online platform as identified in the grant agreement to find interested parties to exploit those results. That obligation may be waived at the request of the beneficiary if justified.

2. Beneficiaries shall disseminate their results as soon as feasible, in a publicly available format, subject to any restrictions due to the protection of intellectual property, security rules or legitimate interests.

   The work programme may provide for additional dissemination obligations while safeguarding the Union's economic and scientific interests.

3. Beneficiaries shall ensure that open access to scientific publications applies under the terms and conditions laid down in the grant agreement. In particular, the beneficiaries shall ensure that they or the authors retain sufficient intellectual property rights to comply with their open access requirements.

   Open access to research data shall be the general rule under the terms and conditions laid down in the grant agreement, ensuring the possibility of exceptions following the principle 'as open as possible, as closed as necessary', taking into consideration the legitimate interests of the beneficiaries including commercial exploitation and any other constraints, such as data protection rules, privacy, confidentiality, trade secrets, Union competitive interests, security rules or intellectual property rights.

   The work programme may provide for additional incentives or obligations for the purpose of adhering to open science practices.

4. Beneficiaries shall manage all research data generated in an action under the Programme in line with the FAIR principles and in accordance with the grant agreement and shall establish a Data Management Plan.

   The work programme may provide, where justified, for additional obligations to use the EOSC for storing and giving access to research data.

5. Beneficiaries that intend to disseminate their results shall give advance notice to the other beneficiaries in the action. Any other beneficiary may object if it can show that dissemination of the results would significantly harm its legitimate interests in relation to its results or background. In such cases, the results shall not be disseminated unless appropriate steps are taken to safeguard those legitimate interests.

6. Unless the work programme provides otherwise, proposals shall include a plan for the exploitation and dissemination of the results. If the expected exploitation of the results entails developing, creating, manufacturing and marketing a product or process, or in creating and providing a service, the plan shall include a strategy for such exploitation. If the plan provides for the exploitation of the results primarily in non-associated third countries, the legal entities shall explain how that exploitation is still to be considered to be in the Union's interest.

   The beneficiaries shall update the plan for the exploitation and dissemination of the results during and after the end of the action, in accordance with the grant agreement.

7. For the purposes of monitoring and dissemination by the Commission or the relevant funding body, the beneficiaries shall provide any information requested regarding the exploitation and dissemination of their results, in accordance with the grant agreement. Subject to the legitimate interests of the beneficiaries, such information shall be made publicly available.

Appendix B: SoilValues anticipated exploitation activities

Exploitation activity number	1
Result name	A SHBM for regional decentralised composting through multi-stakeholder collaboration
Result type	Process-based
Description of result	If successful, the new SHBM can redirect natural and financial resources from a waste management narrative towards a nutrient recycling and soil health building narrative. This requires farmers, local and regional governments, nature conservation agencies and other stakeholders to make new arrangements for collaboration. These arrangements need to include mutual guarantees on multiple fronts, such as the quality of biomass supplied, the amount of biomass to be processed periodically, ensuring no negative effects to the environment, etc. Farmers participating in the SHBM can promote their new practice of farm composting and soil health improvements towards their retailers and direct customers by linking their soil health improvements (when measurable or demonstrable) with their perception of increased food quality.
Related WP	WP2
Related task	T2.3, T2.4
Related EO/WI	EO2, EO5
Single or joint ownership of result	1
Owner(s) name	EV ILVO
Owner(s) country of establishment	BE
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Policy recommendations, know-how
IP?	No
IP ownership	NA
Expected time to impact	We will be able to evaluate the viability of the SHBM and its future perspectives best by end of the project (2026)
Exploitation audience or target group	Everyone. The SHBM proposes an alternative way of organizing regionally available biomass to support farmers in building soil health. Its basic principle of providing farmers facing a collective challenge (climate change) through collective support (rerouting publicly managed biomass) can be studied from diverse perspectives and could be translated to different regions and contexts.

Exploitation activity number	2
Result name	Opportunities for agricultural contractors related to machinery use in compost management
Result type	Process-based
Description of result	If successful, the SHBM creates opportunities for agricultural contractors to work in turning over compost heaps (part of the composting process) with specialised machinery. Farmers producing compost would be less reliant on price setting by external actors for compost and other fertilisation products. When the societal benefits (e.g., better water management, climate adaptation and-mitigation effects) can be demonstrated, there might be additional valorisation through product marketing, subsidies or Payment-for-ecosystem services type schemes.
Related WP	WP2
Related task	T2.5
Related EO/WI	EO3
Single or joint ownership of result	1
Owner(s) name	EV ILVO
Owner(s) country of establishment	BE
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Policy recommendations, know-how
IP?	No
IP ownership	NA
Expected time to impact	We will be able to evaluate the viability of the SHBM and its future perspectives best by end of the project (2026)
Exploitation audience or target group	Farmers and land-managers

Exploitation activity number	3
Result name	Knowledge sharing between stakeholders regarding soil-health improving practices
Result type	Process-based
Description of result	The SHBM could reduce the polarisation between the agricultural and nature conservation sectors by creating a form of collaboration in which both sectors benefit. Through the CoPs, there will be a lot of knowledge shared between different stakeholders, both in each national CoP and between the different European CoPs. For example, a core aspect of the Belgian TG is the smart application of the compost produced, taking into account the timing (end of year) and coordinating the compost application with measures such as reduced tillage and cover crops. Together, they would reduce leaching and nutrient runoff to the surrounding environment.
Related WP	WP3
Related task	T3.3
Related EO/WI	EO4
Single or joint ownership of result	8
Owner(s) name	THUENEN, AU, WUR, KOIS, EV ILVO, CONSULAI, IRWiR PAN, KU Leuven
Owner(s) country of establishment	DE, DK, NL, BE, PT, PL
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Policy recommendations, know-how
IP?	No
IP ownership	NA
Expected time to impact	2026, associated with D2.3
Exploitation audience or target group	General public & media; citizens & media interested in sustainability and agrifood innovation; researchers, students, PhD graduates, academics; Operators active in and outside the food chain; Project partners and participants; EU Commission and other relevant projects

Exploitation activity number	4
Result name	Insights into circular (bio)economy
Result type	Process-based
Description of result	Stakeholders, including local authorities would like to reduce pollution in green zones like roadsides, dikes and parks by advertising the link between its biomass, soil fertility and food (e.g., "Your food starts here, keep it clean"). The reason for this is explained below: The quality of farm compost depends on the quality of incoming biomass. One aspect of ensuring this quality is keeping the amount of pollution below certain thresholds (max. 0,05% of incoming biomass can be considered trash). This means categorizing the areas of origin for their degree of pollution (e.g., green areas are safe without inspection, orange areas need inspection and red areas are always too polluted). By taking additional measures such as advertising campaigns, infrastructure and clean-up actions, stakeholders hope to reduce pollution in orange and red areas to make more biomass available for composting in the region.
Related WP	WP2
Related task	T2.5
Related EO/WI	WI1
Single or joint ownership of result	1
Owner(s) name	EV ILVO
Owner(s) country of establishment	BE
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Policy recommendations, know-how
IP?	No
IP ownership	NA
Expected time to impact	Unclear
Exploitation audience or target group	General public & media

Exploitation activity number	5
Result name	Scaling of the SHBMs
Result type	Process-based
Description of result	During the process of scaling up the CoPs, the possibility of adopting the SHBM and the practices implemented in each TG to other broader realities will be analysed. Each CoP will discuss whether it is feasible to extend the knowledge acquired to other realities with conditions similar to those of the initial TG.
Related WP	WP3
Related task	T3.3
Related EO/WI	EO4, EO5
Single or joint ownership of result	3
Owner(s) name	THUENEN, WR, CONSULAI
Owner(s) country of establishment	DE, NL, PT
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Know-how, consultancy services
IP?	No
IP ownership	NA
Expected time to impact	M48
Exploitation audience or target group	Land managers, operators active in and outside the food chain

Exploitation activity number	6
Result name	Sustaining CoPs beyond project end
Result type	Deliverable-based
Description of result	At the end of the project, WP3 will have to deliver the CoP Sustainability Plan which will attempt to guarantee the CoPs existence even after the end of the project. Throughout the project, the members of the CoPs will gain a huge amount of knowledge about soil health, the incentives that exist to adopt new practices, and will hopefully have an idea of which are the best practices to implement, both economically and in terms of soil health and sustainability. Because of all this, the SoilValues CoPs will have knowledge that can and should be passed on even when the project is over, and other projects, organisations, associations, etc. will be able to reach out to our CoPs (or to one general CoP, if we unite them all in the end of the project) to share knowledge.
Related WP	WP3
Related task	T3.4
Related EO/WI	EO4, EO5
Single or joint ownership of result	3
Owner(s) name	THUENEN, WR, CONSULAI
Owner(s) country of establishment	DE, NL, PT
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Know-how, consultancy services
IP?	No
IP ownership	NA
Expected time to impact	Beyond project end
Exploitation audience or target group	Land managers, operators active in and outside the food chain

Exploitation activity number	7
Result name	Market and policy incentives supporting SHBMs
Result type	Process-based
Description of result	Identification and analysis of existing market and policy incentives, which have the greatest prospects of success in supporting SHBMs in different farming systems across Europe
Related WP	WP4
Related task	T4.1
Related EO/WI	EO2
Single or joint ownership of result	1
Owner(s) name	KOIS
Owner(s) country of establishment	BE
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Policy recommendations, know-how
IP?	No
IP ownership	NA
Expected time to impact	The exploitation started after the ER became available in March 2024, and will continue after the end of SoilValues project.
Exploitation audience or target group	Financiers supporting SHBMs; National and regional policymakers and EU Commission; Operators active in and outside the food chain; citizens & media interested in sustainability and agrifood innovation; Project partners and participants; Other relevant projects

Exploitation activity number	8
Result name	Roadmap for designing and implementing effective incentives for SHBMs
Result type	Deliverable-based
Description of result	The roadmap will provide insights and recommendations on the enabling conditions and key success factors for soil health incentives, improving the understanding of the governance and challenges for an effective implementation of innovative of public and private incentives for soil health.
Related WP	WP4
Related task	T4.2
Related EO/WI	EO3
Single or joint ownership of result	8
Owner(s) name	THUENEN, AU, WUR, KOIS, ILVO, CONSULAI, IRWiR PAN, KU Leuven
Owner(s) country of establishment	DE, DK, NL, BE, PT, PL
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Policy recommendations
IP?	No
IP ownership	NA
Expected time to impact	Exploitation is expected to start in autumn 2025.
Exploitation audience or target group	Financiers supporting SHBMs; National and regional policymakers and EU Commission; Operators active in and outside the food chain; citizens & media interested in sustainability and agrifood innovation; Project partners and participants; Other relevant projects

Exploitation activity number	9
Result name	Interactive toolbox of incentives
Result type	Deliverable-based
Description of result	The toolbox will be an interactive website designed to serve as a decision support tool for policymakers, farmers, public and private investors in designing, implementing and making use of effective incentives for soil health.
Related WP	WP4
Related task	T4.3
Related EO/WI	EO5, WI3
Single or joint ownership of result	1
Owner(s) name	KOIS
Owner(s) country of establishment	BE
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Toolbox
IP?	No
IP ownership	NA
Expected time to impact	M46
Exploitation audience or target group	Land managers, policy makers, operators active in and outside the food chain

Exploitation activity number	10
Result name	Awareness of the economic and environmental value of investing in soil health
Result type	Process-based
Description of result	KOIS will leverage the findings from SoilValues WP4 to advance the exploitable objectives by raising awareness of the economic and environmental value of investing in soil health (EO1) and by catalysing investment opportunities across value chains (EO2). Through thought leadership and consultancy services, KOIS will engage financial institutions, value chain actors, and other stakeholders to demonstrate the multiple benefits of soil health, while designing and promoting innovative financial structures that drive effective and scalable investments in soil-health, regenerative farming practices.
Related WP	WP4
Related task	T4.1
Related EO/WI	EO1, EO2
Single or joint ownership of result	1
Owner(s) name	KOIS
Owner(s) country of establishment	BE
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Know-how, consultancy services, policy recommendations
IP?	No
IP ownership	NA
Expected time to impact	The exploitation started after the ER became available in March 2024, and will continue after the end of SoilValues project.
Exploitation audience or target group	Financiers supporting SHBMs; National and regional policymakers and EU Commission; Operators active in and outside the food chain; citizens & media interested in sustainability and agrifood innovation; Project partners and participants; Other relevant projects

Exploitation activity number	11
Result name	Developing a Sustainable CSA Business Model
Result type	Process-based
Description of result	DK SoilValues team has closely collaborated with a Danish farm operating under a Community Supported Agriculture (CSA). We participated in regular strategic meetings—sometimes weekly—to design and implement a business model that aligns with the farmer's commitment to soil health practices and supporting ownership structure. Our involvement led to a survey of the farm's customers to understand their motivations and perceptions on the farm's workings. The findings revealed that while customers appreciate locally sourced food and enjoy the hands-on experience of harvesting their own vegetables, many are not fully aware of the farmer's regenerative agricultural practices. They generally trust the farmer and view his methods as "good" in a broad sense but are not aware of the farmer's big commitment to improving soil health. Results and Impact 1) Enhanced communication strategies: We identified the need for farmers to effectively communicate the value of ecosystem services they provide. Aligning these services with customer values is crucial for justifying premium prices. 2) The research highlighted the importance of: (i) educating customers about regenerative practices to increase their willingness to support and invest in soil health initiatives, or (ii) remain/become a trusted "servant of the good" when it comes to the farming industry, in a way that ensures continuous customer demand.
Related WP	WP2
Related task	T2.3
Related EO/WI	EO1, EO5, WI1
Single or joint ownership of result	1
Owner(s) name	AU
Owner(s) country of establishment	DK
Results will be exploited by owner(s)?	Yes (of more precisely the CSA farmer)
Anticipated exploitation strategy	NA
IP?	Yes
IP ownership	NA
Expected time to impact	Continuously
Exploitation audience or target group	Land managers/owners

Exploitation activity number	12
Result name	Mapping Perceptions of Soil Health Among Regenerative CSAs in a Community of Practice
Result type	Process-based
Description of result	We are conducting a study involving several regenerative CSAs in Denmark in the project's CoP structure, to map how perceptions of soil health and biodiversity stewardship influence their management practices, planning, choice of ownership- and business model, and designing marketing strategies. The research examined the correlation between the farmers' understanding of soil health and their approaches to promoting their products. We also expect to gather insights on, whether the perceived opportunities and barriers for practicing soil health business models among our testing ground farmers, correlate with a broader range of CSA regenerative agricultural farmers in a Danish Community and Practice. From there on, we hope to explore in a Policy Delphi setting, how to make practitioners work together on solving common value chain problems. Results and impact: 1) Influence on management practices: Farmers with a deep awareness and interest in and about soil health are more likely to implement practices that enhance biodiversity and soil health.
Related WP	WP3
Related task	T2.4
Related EO/WI	EO1, EO5, WI2
Single or joint ownership of result	1
Owner(s) name	AU
Owner(s) country of establishment	DK
Results will be exploited by owner(s)?	Yes (of more precisely the CSA farmer)
Anticipated exploitation strategy	NA
IP?	Yes
IP ownership	NA
Expected time to impact	Continuously
Exploitation audience or target group	Land managers/owners

Exploitation activity number	13
Result name	FARManalytics 2.0
Result type	Deliverable-based
Description of result	Model FARManalytics with extension on ecosystem services
Related WP	1
Related task	T1.5
Related EO/WI	EO1, WI1
Single or joint ownership of result	1
Owner(s) name	WEcR, Maarten Kik and Bert Smit, in cooperation with WU-BEC
Owner(s) country of establishment	NL
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Policy recommendations, know-how
IP?	No
IP ownership	NA
Expected time to impact	2025
Exploitation audience or target group	Researchers, students, PhD-graduates, project partners, EU

Exploitation activity number	14
Result name	SHBM co-learning and co-creation
Result type	Process-based
Description of result	Engaging in the TGs and the CoPs requires a great deal of effort from the stakeholders. However, they also receive significant return on their investment through shared learning and knowledge transfer. These shared insights are used to co-create the SHBMs and to share successes and overcome barriers and hurdles when doing so.
Related WP	5
Related task	T5.3
Related EO/WI	EO1, EO2, WI2
Single or joint ownership of result	8
Owner(s) name	THUENEN, AU, WUR, KOIS, ILVO, CONSULAI, IRWiR PAN, KU Leuven
Owner(s) country of establishment	DE, DK, NL, BE, PT, PL
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	SoilValues Ambassadorship certificate
IP?	No
IP ownership	NA
Expected time to impact	Start of 2025
Exploitation audience or target group	land managers/owners, up- and downstream value chain actors, intermediaries

Exploitation activity number	15
Result name	Practice briefs
Result type	Deliverable-based
Description of result	20 practice abstracts on the roadmap to setting up the CoPs and on the individual TGs and their SHBMs.
Related WP	WP2, WP3
Related task	T3.2
Related EO/WI	EO1, WI1
Single or joint ownership of result	3
Owner(s) name	WR, CONSULAI, EV ILVO
Owner(s) country of establishment	NL, PT, BE
Results will be exploited by owner(s)?	Yes
Anticipated exploitation strategy	Practice abstracts (know-how)
IP?	No
IP ownership	NA
Expected time to impact	M48
Exploitation audience or target group	Policy makers

Appendix C: SoilValues Marketing Plan

Summary

The Horizon Europe Model Grant Agreement requires that a marketing plan will be developed aiming to promote soil health to the farming and forestry community. The success of this project is directly related to the (future) uptake of the project's Soil Health Business Models (SHBM) by land managers, with the substantive support of the intermediary actors of the food value chain, referred to here as the upstream and downstream actors. To capture this support, a SoilValues marketing plan is developed which leverages the active engagement of land managers and stakeholders in the Testing Grounds (TGs) and the Communities of Practice (CoPs), as well as making use of the project communication, dissemination and exploitation activities.

At the heart of the projects' SHBMs is the production of ecosystem services (ESS). All farming systems produce ESS, but it has since become clear that while the conventional system is very successful in producing plant and animal proteins, it has negative impacts on nature in different aspects. The SHBMs of the SoilValues project focus on agricultural practices that promote the quality of nature, and specifically soil health, without compromising food security, increasingly referred to as regenerative agriculture.

When talking about financing the transition towards regenerative agriculture, we are faced with the fact that ESS are a rather heterogeneous group of products and services. Some clearly have the characteristics of a market good, while others are rather collective goods, with the middle category being products and services that have characteristics of both categories.

With the above, it becomes clear that the marketing plan aims to reach not only the community of land managers (supply side of ESS) and their advisors, but also upstream and downstream actors, consisting of agrifood suppliers, traders, raw material processors, food producers, retailers as well as consumers or taxpayers (demand side of ESS).

1 Introduction

Soil is a key asset that is essential for agriculture and food production. It requires continuous investments from land managers to keep soils in a good condition, that is, preventing land degradation and increasing soil fertility, but also to be able to cope with climate change and increase farm resilience. Along with labour and capital, soils are a key factor in food production and the land managers business model. The way soils are farmed generates negative externalities which classifies soils into healthy and non-healthy soils. Healthy soils are also important for society as a whole, generating key ecosystem services (ESS) such as clean water, carbon sequestration and biodiversity. While awareness is increasing, soils remain relatively invisible to business boardrooms and the general public, resulting in an underinvestment in soil health as land managers often lack the resources to adopt practices supporting soil health.

Business models are ways in which individuals and organisations create and capture value, to finally sell a product that should receive the recognition for the extra value created. Land managers (in agriculture and forestry) combine man-made resources with natural resources (ecosystems) to produce marketable products like food, feed, fibre and wood. While doing so, they produce ESS that are generally not marketed or compensated, such as clean water, biodiversity, and aesthetic landscapes. Further, the value created from certain products is almost systematically not valorised by the upstream and downstream actors in the food chain, that will buy, transform, and sell on the produced product.

Healthy soils in particular contribute to many ESS. However, land managers generally have little incentive to invest in healthy soils as they cannot sufficiently capture the value generated by these ESS. SoilValues aims to improve the ability of land managers to capture the value generated by ESS by exploring how to enhance the conditions for developing successful soil health business models (SHBMs). As part of this approach, the current document formalizes a SoilValues marketing plan for soil health positioned around ESS derived from soil health-improving management practices.

All farming systems produce ESS, but while the conventional farming system is very successful at producing food and biomass, this often comes at the cost of the environment. The SHBMs considered within SoilValues therefore focus on integrated agricultural practices that promote the quality of nature, and specifically soil heath, without compromising food security. Combined, these practices are increasingly referred to as regenerative agriculture by economic operators[2]. Although the term does not have a strict definition and encompasses a variety of approaches, we will use it when marketing soil health enhancing business models in this document. The various work packages (WPs) throughout SoilValues work together to set-up, evaluate and anchor these agricultural practices within SHBMs for long-term sustainability, considering environmental, social and economic impacts. In WP 1, the environmental and economic impact of a select set of sustainable agricultural practices is mapped and calculated in detail. Based on the calculated supply of ESS, the willingness to pay will be further investigated. WP 4, which centres around incentives, has conducted interviews with key stakeholders in and around the agri-food chain to identify the barriers to financing this transition to regenerative agriculture, considering the ESS as the generated product (Vanzini et al., 2024).

Using the above-described interactions between sustainable agricultural practices, ESS and SHBMs, this document presents a marketing plan for soil health. A marketing plan usually describes how elements of the marketing mix—product, price, promotion and place—will be used to market a product towards

[2] See for example the Regenerating Together Programme of SAI Platform (https://saiplatform.org/regenerative-agriculture-programme/). SAI Platform is the world's largest network of food and drink companies advancing sustainable agricultural practices.

consumers. Translating this approach to marketing ESS and SHBMs involves targeting the suppliers of ESS, i.e., farmers and foresters, and equally as important, the upstream and downstream actors of the food values chain, including agrifood suppliers, traders, raw material processors, food producers, retailers as well as consumers or taxpayers. The latter implies policy makers and politicians, as they represent the societal demand. Since the SoilValues Dissemination and Exploitation Plan (captured in its most recent version in D5.7) already discusses the 'promotion' element in great detail, this marketing plan focuses on the elaboration of the 'product' element of the marketing mix. More specifically, in the following sections we will (1) elaborate on the definition of the ESS within the context of SHBMs, (2) define the agricultural practices that may contribute to the improvement of soil health and thus the overall positive impact on the quality of nature, (3) describe the categorisation of ESS in market and/or public goods, (4) finetune the target groups of this marketing plan for soil health, and (5) develop a SoilValues ambassadorship as a form of recognition for the effort delivered by the above-mentioned target groups.

2 Defining ecosystem services

Defined as the contributions that ecosystems make to human well-being, and distinct from the goods and benefits that people subsequently derive from them, ESS include various products/services, ranging from the production of (agricultural) products and raw materials, through the management of soil (fertility, structure, water storage and retention, biodiversity, soil organic carbon, ...), water, air, fauna & flora, to the creation and maintenance of valuable landscapes. The Common International Classification of Ecosystem Services (CICES) has created a common classification to evaluate ESS in a comprehensive and consistent manner. The CICES classification uses a detailed hierarchical framework, organizing ESS into a multi-level classification system, starting from *Section* (provisioning, regulation & maintenance, and cultural), through *Division* and *Group,* to *Class*. This multi-level classification covers the wide range and complexity of ESS and allows for a more comprehensive and detailed consideration of ESS, facilitating the use of the framework at different scales and across different ecosystems. Nonetheless, this detailed structure of CICES can also make it more complex and technically demanding to apply compared to simpler classification systems. The CICES is not intended to replace other existing classification systems, but rather allows for an easy translation between them.

SoilValues has adopted the CICES V5.1 classification system (Haines-Young and Potschin, 2018) as a default, but has simplified names and descriptions to facilitate the communication with the different stakeholders. The ESS classes which were identified as relevant with the SoilValues project from the CICES V5.1 list are presented in Tables 2.3 until 2.12 of the internal report related to task 1.1. *Knowledge base on the ecosystem services concept, on technologies and data support systems for soil ecosystem services and on soil health business models*. This report will be published later in the project as part of deliverable D1.1. As the level of detail describing each requirement in the interventions of the strategic plans of the Common Agricultural Policy is wide, we opted to build a classification scheme where the classes reflect a different level of detail. Therefore the classification is divided into tiers where the farming practices are described with a higher level of details from tier 1 to tier 2 and 3. In order to facilitate the user in finding the farming practice to classify, the farming practices are aggregated in Sections (e.g., plant protection, fertilisation and soil amendments, soil management, grassland and grazing etc.). These 18 sections have no other meaning in the classification than to help users find their way in the numerous farming practices described in the classification. The classification is composed of 45 tier 1 classes, 164 tier 2 classes and 157 tier 3 classes.

Table 5. Relevant ecosystem services classes for SoilValues

Table in CICES V5.1	ESS Classes
Table 2-3	ESS related to crops and material from cultivated plants (Biomass production)
Table 2-4	ESS related to water used for drinking or as material
Table 2-5	ESS related to water purification and waste treatment
Table 2-6	ESS related to erosion regulation and prevention and flood risk
Table 2-7	ESS related to humans' protection from nuisances, extreme events and weather conditions
Table 2.8	ESS related to GHG regulation and soil quality
Table 2-9	ESS related to pollination & biodiversity maintenance and control
Table 2-10	ESS related to recreation, culture, education
Table 2-11	ESS related to crops and material from wild plants
Table 2-12	ESS related to soil minerals used for food or other purposes (raw materials)

SoilValues will focus on ESS for soil health, defined by the US Department of Agriculture as "*the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans",* the meaning of which tends towards a concept in which the health of the environment, animals and humans are all connected by the soils' continued provision of vital ESS (Lehmann et al., 2020). To be able to compensate land managers for supplying ESS, credible monitoring, reporting and verification (MRV) systems are needed.

ESS are now well recognised for their value (Gómez-Baggethun et al., 2010; van der Meulen and Maring, 2018). By making a distinction between use and non-use values, The Total Economic Value (TEV) framework (TEEB, 2010) allows for the wide array of benefits provided by ESS to be expressed in economic value. Economic valuation of soil ESS not only highlights their significance for human and societal wellbeing but also facilitates decision-making across various organisational levels concerning soil and land management, because it allows us to consider the full range of relevant effects. Often, many ESS refer to public goods, making their impact less obvious and direct and anchoring their value more strongly within indirect use. Since preferences for these services may not be well-defined, without valuation, their importance might be overlooked. Also, in many cases there are trade-offs between the different ESS. By utilising economic valuation, we gain a better understanding of the possible effects and trade-offs, leading to more informed decision-making. Moreover valuing (and thus pricing) ESS, such as biodiversity, can be a stepping stone in the development of 'nature' markets.

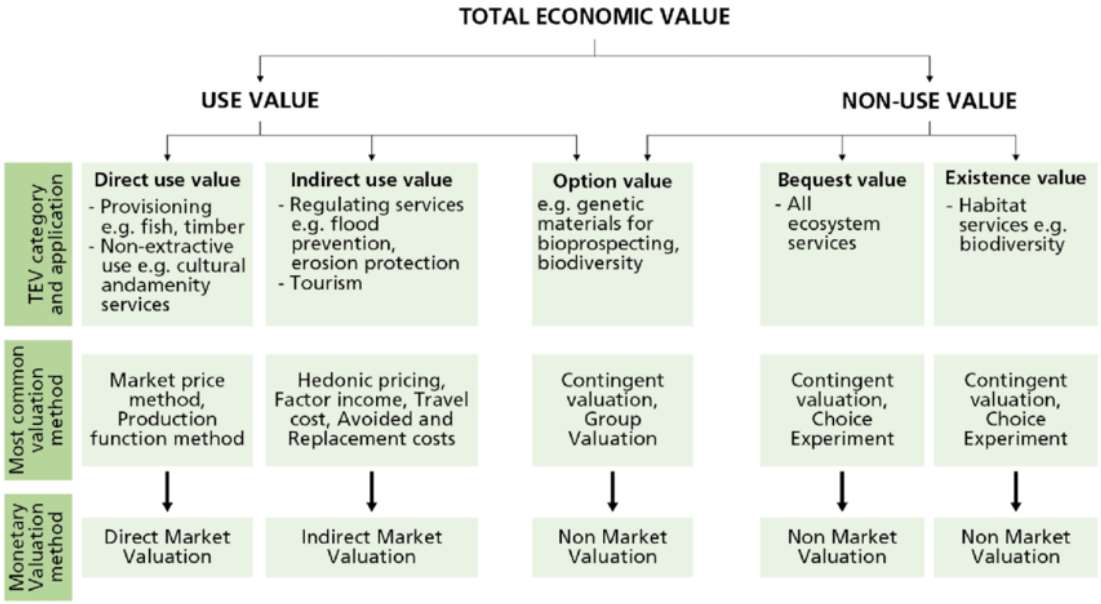


Figure 3. Total Economic Value (TEV) framework (de Groot et al., 2022)

As is demonstrated in Figure 3, the TEV framework allows for ESS to be valued (in)directly through markets and market prices. When talking about financing the transition towards regenerative agriculture, we must, however, consider that ESS are a rather heterogeneous group of products and services. Some ESS have all the characteristics of market goods (think of agricultural products and commodities). They meet specific quality requirements and are available in individual units to all consumers at a market price. These ESS are financed by the citizen as a consumer. Alternatively, some ESS have all the characteristics of public goods, meaning they are non-rivalrous, non-excludable and therefore have no market price. A classic example is clean air. Without intervention from governmental institutions, the supply of public goods will always be insufficient due to the existence of free-riders. As such, ESS with the characteristics of public goods are financed by government budget or by the citizen as a taxpayer. Finally, some ESS have the characteristics of both a marketed and a public good, these are

referred to as quasi-public goods. Similarly to public goods, the marginal cost of allowing an additional consumer to consume a quasi-public good is (close to) zero. However, unlike public goods, quasi-public goods are excludible (Berlage and Decoster, 2000). In the case of ESS with a quasi-public good characteristic, citizens are financing these as both a taxpayer and a consumer. To the extent that regenerative agricultural practices produce products and raw materials that yield higher quality (taste, appearance, origin, etc.), consumers are willing to pay more (cf. the market for organic products). To the extent that this premium price does not cover the additional cost, there is a need for additional funding from the public budget.

3 Regenerative agriculture practices

Regenerative agriculture has emerged as an accessible, though not well-established framework for improving soil health and fostering sustainable agriculture and food systems. The concept of regenerative agriculture, despite its growing prominence, lacks a universally accepted definition, fuelling debates about its meaning and scope. Diverse interpretations have emerged over the years, ranging from ones that focus strictly on soil, to other more holistic approaches that consider climate, biodiversity, water management, and broader ESS, including nutrient cycling, air quality, and habitat provision. Some definitions extend even further, incorporating socio-economic impacts on farmers and local communities. Aligning our analysis to the European Commission's Mission Soil, we consider that regenerative agriculture "has as its core the intention to improve the health of soil" and that soil conservation serves as an entry point to contribute to more holistic ESS and broader environmental, productivity, and economic benefits.

Definitions of regenerative agriculture have been categorised as process-based, focusing on the inclusion or exclusion of one or more specific agricultural practices; outcome-based, emphasising its potential impacts; and hybrid when there is a mix of the two. While other established sustainable agricultural models adhere to a stringent process-based framework, regenerative agriculture offers flexibility to farmers on how to achieve certain results. This approach underpins the analysis carried out within SoilValues as we value its adaptability for widespread application. The absence of a rigid definition makes regenerative agriculture accessible to a broad range of farmers, including those engaged in conventional practices, whose participation is crucial for achieving transformative change at scale. On the other hand, this lack of specificity increases the risk of greenwashing, as claims related to regenerative practices are challenging to verify and validate. In our view, an inclusive, flexible, outcome-based definition is instrumental to unlocking the transformative potential of regenerative agriculture. At the same time, clearly establishing the perimeter of action is essential for safeguarding stakeholder interests across the value chain and ensuring the market's sustainable growth and consolidation.

Although not rigorously defined, regenerative agriculture is grounded in five key principles (Manshanden et al., 2023) (Figure 1) namely minimizing soil disturbance, covering the soil, maximizing crop diversity, preserving living roots, and integrating animals, which are becoming increasingly popular among food value chain actors.

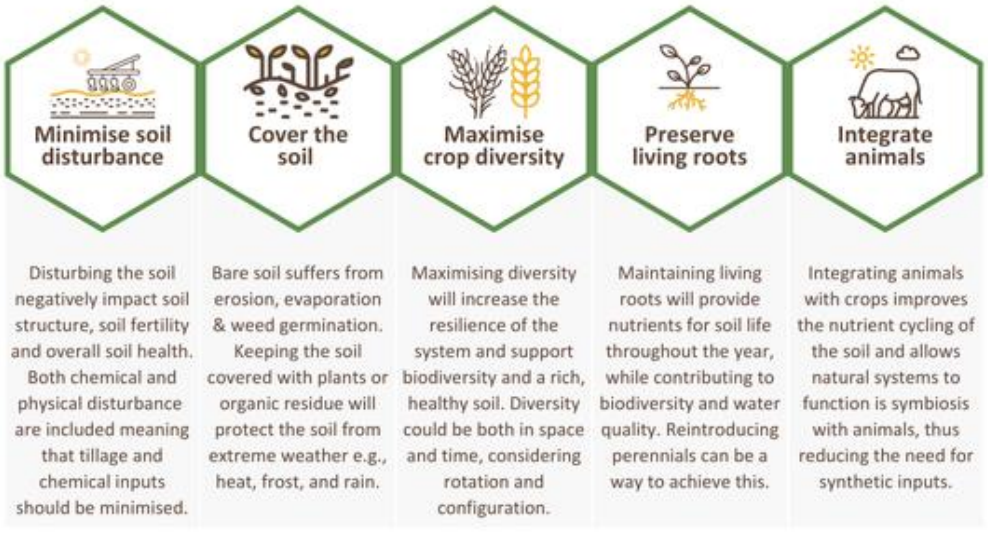


Figure 4. The five principles of regenerative agriculture (adapted from Manshanden et al., 2023)

The five key principles of regenerative agriculture are used by a wide range of stakeholders and serve not only as a theoretical framework but also as practical guidelines for farmers contemplating the transition to regenerative practices. To translate these principles into tangible actions, researchers and practitioners have mapped regenerative farming practices and described how they contribute to the broader principles. These are not prescriptive requirements but rather a 'menu of options' from which farmers—and those involved in the agricultural sector—can select to facilitate their transition. Key practices identified as foundational to regenerative agriculture include, but are not limited to, minimal or no-tillage, stubble retention, cover crops, intercropping, composting (reducing chemical inputs), bio-stimulants application, diverse crop rotations, rotational grazing, and the integration of agroforestry systems. Table 2 presents a formalised classification of said regenerative agricultural practices utilised within SoilValues (European Commission. Joint Research Centre, 2024).

Regenerative farming turns our current agricultural paradigm upside down. It promotes restorative techniques that work in line with nature rather than against it. Preliminary evidence suggests that regenerative management not only improves ecosystem health but also nutrient density. A 2022 study of US farming highlighted that food produced in regenerative systems had higher nutritional value than conventional plots (Montgomery et al., 2022). Comparing neighbouring farms, the study found that crops produced under regenerative management had 11-34% higher nutritional composition. Analysis of meat products further echoed the message. Beef and pork from regenerative farms had more omega-3 and a-linolenic acid, two essential nutrients for human health and development. In short, farming practices influence the quality of the soil, and the quality of the soil has a significant impact on the quality of our food (Barclay, 2023).

Table 6. Classification of regenerative agricultural practices utilized within SoilValues

Practice n°	Farm practices	Definition
Minimise soil disturbance		
1	Machine weight and stress on soil	Farming decisions that affect soil compaction caused by machinery within farm fields.
2	* Controlled traffic farming (CTF)[3]	CTF involves a distinct and permanent separation between the crop zone and the traffic lanes in crop production systems. This reduces compaction in the crop zone and reduces the total trafficked area on the field.
3	* Reduce or increase machinery weight	Over time, did you decrease or increase the weight of the machinery that is used in your fields?
4	Subsoil management	Use of farm practices that are aimed at altering the subsoil properties, that is the soil layer below the topsoil layer (approximately over 30cm below the surface).
5	* Deep tillage (incl. subsoiling, deep plowing, and deep mixing)	Deep tillage, is a tillage technique that goes deeper than usual conventional tillage and affects both the topsoil and subsoil. It includes various techniques such as subsoiling, deep ploughing, and deep mixing.
6	* Use of crops contributing to subsoil management	The inclusion of deep-rooting crops (e.g., lucerne, chicory, and lupine) that can alter subsoil properties by penetrating compacted soil layers.
7	Reduce(d) tillage	A reduction in the intensity, area, or depth of tillage activity, by moving from conventional/intensive tillage to lighter and less deep tillage practices such as conservation, site-specific, low or no tillage.
8	* Conservation tillage	Conservation tillage is "a tillage or tillage and planting combination that retains a 30% or greater cover of crop residue on the soil surface" (Carter, 2005). It includes for instance no-till, strip till, mulch till, and ridge till.
9	* Site-specific tillage	Tillage practice that determines the tillage depth according to factors such as soil type and moisture.
10	* No tillage	With no tillage, there is no tillage during the entire year. “Crop residues left on the soil surface may be disturbed in strips up to one-third of the row width for planting or drilling seed.”
29	Crop residue management	The set of farm practices that are aimed at altering the amount and/or the fate of crop residues.
30	* Crop residue harvest	Crop residues (e.g., cereal straw, grass seed hay, and sugar beet leaves) are partially or fully harvested.
31	* Get residues in the soil	Plow crop residues in the soil instead of letting them lay on the soil or being harvested.
32	Fertilizer	Any substance applied on the land to supply the crop with nutrients.
33	* Mineral fertilizer application	The application of mineral/inorganic fertilizer on/in your field. I.e., Do you apply inorganic/mineral fertilizer on/in your field?
34	* Fertilizer application	The application of fertilizer (inorganic and/or organic fertilizer) on/in your field?
35	* Fertilizer timing and placement	Optimization of the fertilizer timing and place where fertilizer is placed in/on the soil to enhance crop yield and/or reduce negative environmental impacts.

[3] (*) = a * are just sub-level of the bold practice above it. For instance CFT (2) and Reduce or increase machinery weight (3) both have a * because they are a sub-level of Machine weight and stress on soil (1)

36	* Processed/upgraded slurry or digestate application	The application of processed/upgraded slurry or digestate on/in your field. Digestate is the remaining organic material from anaerobic digestion of biodegradable products. Processed/upgraded slurry could consist either of fertilizer extracted from slurry (e.g., phosphate) or slurry that has been treated by a process to change its properties (e.g., plasma-treated slurry).
37	Plant protection product (pesticide)	Any substance applied to a crop to control pests, diseases, and weeds.
38	* Pesticide application	The application of pesticides (herbicides, fungicides, insecticides, nematicides,…) on your field/crops.
39	* Precise pesticide application	The application of variable pesticide rates and/or types depending on spatial and temporal heterogeneity to enhance crop yield and/or reduce negative environmental impacts.
40	* Bio-control agents application	The application of bio-control agents on your field/crops. Bio-control agents are organisms or microorganisms that control pests and diseases.
41	Bio-fertilizer application	The application to the soil of microorganisms that support plants in acquiring soil nutrients.
42	Biotic inoculation of seeds and/or soil with plant mutualists	The inoculation of soil and/or seeds with microorganisms that are plant mutualists (e.g., rhizobacteria and mycorrhiza).
43	Irrigation	NA
44	* Irrigation	Do you use any (type of) irrigation on your field/crops?
45	* Deficit irrigation	In case you use irrigation, do you irrigate less than what you think is optimal for your crops (optimal in terms of yield)?
46	Improve drainage	Improve the drainage system, mostly consisting of underground pipes, that transport a surplus of rainwater to canals or ditches. This can consist of installing subsurface drainage, and cleaning and/or repairing drainage pipes.
47	Use land terracing	Land terracing is the transformation of a sloped plane into successive flat fields (think about rice terraces for example).
48	Use land levelling	The modification of your field slope/topography to support plant growth, drainage, irrigation, and/or tillage. This often implies making the field as flat as possible to make the growing conditions in the field as uniform as possible.
49	Liming material application	The application of liming material (e.g., limestone, lime, and Gypsum) to your field.
50	Mulching	The action is to cover the soil with any material (leaves, wood chips, plastic, etc.) that will help retain moisture.
51	Organic amendments application	The application of organic material (e.g., organic fertilizer, manure, compost, biochar,…) on/in your field.
52	* Slurry application	The application of slurry on/in your field. Slurry is a liquid mix of solid and liquid manure (and also other organic material in some cases).
55	* Biochar application	The application of biochar on/in your field. Biochar is any organic material that has been under a process called pyrolysis (carbonization at high temperature in the presence of low or no oxygen).
Cover the soils		
26	Use cover crop	Include cover crops, which are defined as crops that are planted within fields to cover the soil for environmental purposes (e.g., to reduce nutrient leaching and erosion) rather than being harvested. This is mostly applied during the winter season and between two harvestable crops.
27	* Cover crop used as green manure	Cover crops are ploughed into the soil to improve soil quality.
28	Set-aside	A certain percentage of the land/field is not used for any agricultural productions (i.e., set aside).
Maximise crop diversity		
11	Cultivar mixture	The simultaneous cultivation in the same field of two or more cultivars of the same crop species (i.e., different cultivars from 1 species).

16	Intercropping	"The simultaneous cultivation in the same field of two or more crops (different species) for all or part of their growth cycle".
17	Cropping plan	The cropping plan determines the number of hectares and spatial location occupied by each crop on the farm.
18	Crop selection	The choice of crops that are cultivated on the farmland.
19	* Cultivate climate and disease-resistant crop varieties.	Crop varieties that are known to be more resistant to climate (e.g., drought) and/or disease than other varieties from the same species.
20	* Cultivate lignocellulosic crops	Lignocellulosic crops are characterized by a high lignocellulose content (e.g., 80%), and are therefore not suitable for human or animal consumption but used for industrial use (e.g., bioenergy).
21	* Cultivate perennials	Perennials are defined as crops that do not need to be replanted each year.
22	* Cultivate legumes	Legumes (e.g., clover, beans, alfalfa) are defined as crops from the family Fabaceae.
23	Crop rotation	Crop rotation is defined as a sequence of crops grown on a field in a cycle period (Dury et al., 2012).
24	* Use of crop rotation (vs no rotation)	Implementation of a crop rotation instead of a monoculture.
25	* Use legumes within rotation	Include legumes within one or several growing seasons of the crop rotation (not as a cover crop between growing seasons).
Preserve living roots		
12	Agroforestry	The combination of woody species (e.g., trees and shrubs) with crops and/or livestock simultaneously or sequentially on the same field.
13	Field margins	Plants (trees, flowers, etc.) are planted along field edges, between fields, or between crop areas (subfields) (e.g., hedgerows, flower strips, etc.).
14	* Hedgerows	Woody species are planted in a linear pattern along field edges, between fields, or between crop areas (e.g., shelterbelts, windbreaks, and live fences).
15	* Flower strips	Flower strips are planted along field edges, between fields, or between crop areas.
Integrate animals		
51	Organic amendments application	The application of organic material (e.g., organic fertilizer, manure, compost, biochar,…) on/in your field.
53	* Solid manure application	The application of solid manure on/in your field. Solid manure is a solid mixture of dung/faeces, urine, and in some cases organic material (for instance straw from bedding material).
54	* Compost application	The application of compost on/in your field. Compost is composed of organic material that has been decomposed before being applied to the field as a fertilizer. It includes for instance compost from household residues, compost from organic material (e.g., green compost from grass), and bokashi.

Research has highlighted the positive impact of these practices, including improvements in soil quality, carbon sequestration, water retention, biodiversity restoration, and agricultural yields. However, the extent of the benefits derived from regenerative practices cannot be universally applied across all landscapes and geographies. The impact is highly dependent on the specific context of the farm as well as the degree to which these practices are adopted. Indeed, regenerative agriculture is often adopted incrementally, beginning with basic, easily integrable practices before progressing to more advanced systems which demand higher investments and years of data and experimentation for optimal implementation. Although attempts to identify basic, intermediate, and advanced practices have been made (Figure 2), the transition is not uniform. Starting points, transition stages, and associated practices vary significantly from one farmer to another. This diversity illustrates the reality that transitioning to regenerative agriculture is not a swift overhaul but rather a long-term journey spanning several years (Kurth et al., 2023). This phased, trial-and-error approach is crucial, as it allows farmers to adopt practices that best suit their unique circumstances, and gradually build more sustainable and resilient agricultural systems.

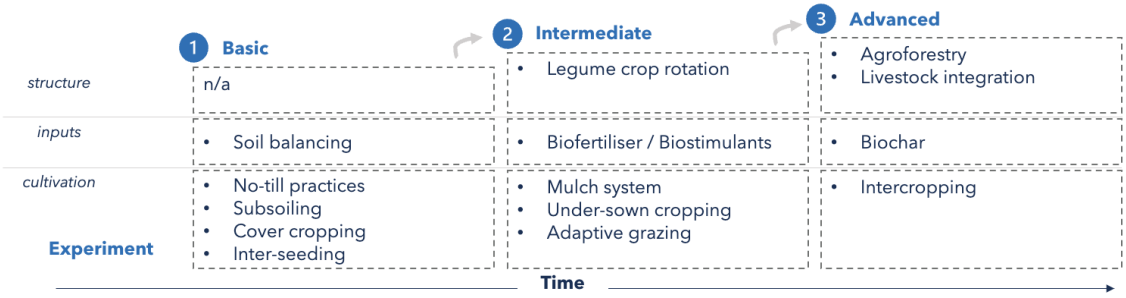


Figure 5. The dynamics of regenerative agriculture (Kurth et al., 2023)

4 Finetuning target groups/end-users

Within SoilValues, our primary target groups are the farmers, foresters and land owners/managers, at the core of the food and forestry community. Though they are crucial participants for the uptake of soil health practices across Europe, they will only offer ESS to the extent that there is a societal demand, reflected by citizens willing to pay for ESS as consumers or taxpayers. However, they cannot do so alone. Changes in agricultural practices inevitably affect upstream and downstream actors who will also have to adapt their products, processes and systems in response. In other words, we need to expand our target audience on the supply and the demand side of the equation with (1) the upstream actors (agrifood suppliers), (2) the downstream actors in the food chain traders, processors, food producers and retailers who produce and distribute market goods for the benefit of consumers, (3) the policymakers and politicians who need to mobilise sufficient financial resources to enable the production of the public goods, and (4) the intermediaries such as financiers, agricultural consultants and project developers, who can play a key role in bringing these goods to the market.

To reach those target groups and have an impact on the entire community, we need to include and communicate towards scientists, land owners and managers, agrifood suppliers, food processers and producers, food retailer, organisations, NGOs, policy makers, politicians, intermediaries such as farm advisors and advisory companies, financial institutions, research organisations and the general public/citizens either as consumer or as taxpayer. It is important to take note that different target audiences have different concerns, capacities and interests which need to be explicitly understood and recognised when setting objectives and selecting strategies in order to meet the specific communication needs of these audiences. Therefore, we distinguish three audience levels in the set-up of the SoilValues Dissemination, Exploitation and Communication Strategy (D5.7)(Table 3).

Table 7. Audience levels in the SoilValues DECS (Deliverable D5.7)

Communication objectives	Target names	Target details
Dissemination for Awareness	General audience	(1) The general public and media (2) People with a special interest in sustainability and agricultural innovations
Dissemination for Understanding	Target audience	Those stakeholders that may benefit from the SoilValues results but are not directly involved in the project such as (1) Other universities and research institutes (2) Up and downstream operators active in and outside the value chain
Dissemination for Action	Project audience	Aimed at the change of agricultural practices resulting from the implementation of the SoilValues incentives and business models. (1) All actors involved in the Testing Grounds (TGs) and the Communities of Practice (CoPs) (2) Policy makers, the European Commission and other selected projects under this action

5 SoilValues marketing activities

Effectively generating impact from results within a Horizon Europe project requires a clear strategy that can be easily adopted by the project beneficiaries, but which is simultaneously flexible enough to adapt to the needs of the results as they become available throughout the project's lifetime. As a supplement to the dissemination, communication and exploitation strategies (described in detail in deliverables D5.1, D5.7, and D5.2), the SoilValues Marketing Plan builds on project results in an attempt to leverage their uptake and reuse amongst a wider group of end-users (described in section 4). This will be done through two main activity types, differing in their targeted end-users, namely audio-visual materials and the SoilValues Ambassadorship.

The communication and promotion material such as the policy briefs, factsheets, video testimonies are a diverse range of tools facilitating the outreach to the large spectrum of target groups. A mismatch between project results and target groups can be avoided in translating the project results into different "languages", by choosing the vocabulary carefully, and in adapting the length and type of material. The Exploitation roadmap and IPR Strategy for exploitation (D5.2) developed for SoilValues guarantees the uptake activities by and for the research and scientific communities.

Audio-visual materials

Throughout the lifetime of the project a total of 22 audio-visual materials will be generated. Sandwiched between one general introductory video created at the start of the project and one video highlighting the projects' realizations at the end, an additional 20 videos will be created: 10 of which will introduce soil health practices and business models, and 10 of which will contain testimonials from the SoilValues TGs and CoPs. The introductory and final project videos will target the entire range of end-users identified above (section 4), namely land owners/managers, upstream and downstream actors in the agrifood chain, intermediaries, as well as the general public. The 10 videos introducing soil health practices and business models will target land owners and managers, as well as actors along the food chain (up- and downstream and intermediaries). The 10 testimonial videos introducing the SoilValues case studies will similarly target land owners and managers, as well as intermediaries, policy makers and the general public.

The audio-visual materials will be created in cooperation between the TG and CoP leads, the stakeholders involved in each, as well as ELO (WP5 leader) who will provide technical support. The timing of the audio-visual materials will follow what has been described in the Grant Agreement:

- M12 – introductory video
- M24 – 10 videos on soil health practices and business models
- M36 – 10 testimonial videos
- M46 – project results video

SoilValues Ambassadorship

While the audio-visual materials primarily target end-users outside of the project, the SoilValues Ambassadorship has been created to target end-users within the project. Specifically, land owners and land managers involved in the TGs, as well as up- and downstream value chain actors and intermediaries involved in the CoPs are eligible to receive a SoilValues Ambassadorship. The objective of the SoilValues Ambassadorship is to create a sense of ownership among SoilValues end-users by certifying their commitment to soil health. The SoilValues Ambassadorship will be formalised in a certificate which will be designed following the project's visual identity and which will be translated into the respective

languages of the end-user(s). This certificate will on the one hand enable end-users to validate their involvement in the SoilValues project and their commitment to their respective SHBMs to externals, and will on the other hand increase SoilValues outreach for increased exploitation of project results. The primary requirement for obtaining the certificate of SoilValues Ambassadorship is an end-users' active involvement in the project through either the TGs or the CoPs. No additional binding or legal requirements are associated with certification.

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