SoilValues

D2.2 Six implementation plans for Testing Grounds with completed Business Model Canvas

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Author(s)	Bert Smit, Helmut Saatkamp, Ennio Facq, Lene Cillen, Sylvie Fosselle, Hans Vandermaelen

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Author(s)	Bert Smit (WR), Helmut Saatkamp (WU), Ennio Facq (EV ILVO), Lene Cillen (EV ILVO), Sylvie Fosselle (EV ILVO), Hans Vandermaelen (EV ILVO)
Contributors	Martin Hvarregaard Thorsøe (AU), Kasper Krabbe (AU), Marie von Meyer-Höfer (THUENEN), Gerald Schwarz (THUENEN), Jan Hassink (WR), Piotr Gradziuk (IRWiR PAN), Katarzyna Zawalińska (IRWiR PAN), Vitaliy Krupin (IRWiR PAN), Adrianna Wojciechowska (IRWiR PAN), Diogo Moniz (CONSULAI), Margarida Próspero (CONSULAI)
Reviewers	Sylvie Fosselle (EV ILVO) and Dina Lopes (CONSULAI)
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Acronyms and abbreviations

BMC	Business Model Canvas
CoP	Community of practice
CSA	Community Supported Agriculture
EU	European Union
FBC	Flourishing Business Canvas
IP	Implementation Plan
KZPBC	The National Union of Sugar Beet Growers (Poland)
LL	Living lab
MRV	Monitoring, reporting and verification
SES	Soil-based ecosystem services
SHBM	Soil Health Business Model
SVBMC	SoilValues Business Model Canvas
TG	Testing Ground
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

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Land managers combine man-made resources with natural resources to produce marketable products like food, feed, fibre 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).

Summary

This deliverable D2.2 reports on the establishment of the Business Models Canvas (BMCs) and Implementation Plans (IPs) of the six Testing Grounds included in the SoilValues project. First, the approach followed is explained. Thereafter, a summary presentation of each BMC and IP is provided, followed by a short discussion and conclusion. Finally, in the Appendix, a detailed overview and explanation of the BMC and the IPs, along with underlying data and information, is provided. It is concluded that the six Testing Grounds have been well established and are effectively undertaking their IPs. Furthermore, the participative approach using a BMC proved to be suitable in the joint development and co-design of IPs. Finally, a sound and broad baseline database for each Testing Ground has become available which can be used as a baseline for upcoming development of business models and their analysis in the Testing Grounds.

1. Introduction

The SoilValues project will develop testing grounds (TGs) in six countries that are managed by the following project partners : EV ILVO (Belgium), AU (Denmark), THUENEN (Germany), WR (The Netherlands), IRWiR PAN (Poland) and CONSOLAI (Portugal). Each partner will set up the respective regional TG. Once set up, a thorough analysis will be performed of the economic, agronomic, and environmental data-related and legal specificities of each TG. This will include actors' awareness, needs and readiness for engaging in business models. This analysis will be focused on future development needs of the TGs.

The aim of this deliverable D2.2 is to present the two 'products' derived from the abovementioned activities predominantly carried out within the framework of the respective task (2.2) in SoilValues. For each TG, this deliverable therefore summarizes (1) the Business Model Canvas (BMC) and (2) the completed Implementation Plan (IP). Business models are ways in which individuals and organisations create and capture value (Tomson and Smit, 2017). Land managers (agriculture, forestry) do that through combining man-made resources with natural resources (ecosystems) to produce marketable products like food, feed, fibre and wood, but at the same time produce ecosystem services that are generally not marketed or compensated, such as clean water, clean air, biodiversity, aesthetic landscapes, etc. The challenge is to include these ecosystem services in the business models of land managers. A business model can be summarised in different templates, e.g. in a BMC. An implementation plan is the detailed description of the elements of a business model, showing which goals a land manager has for his enterprise or farm and how these goals will be reached. More information is given in section 2.

In this deliverable, first the approach towards the development of both BMC and IP is described (section 2), including the rationale of the BMC and IP, the potential use of both with regard to a SWOT analysis, and priority setting for improvements in management and business models. Subsequently, section 3 describes the essentials of the BMC and the corresponding IP for all six TGs. A detailed description of the BMC and the IP of each TG is provided in the Appendix, including a complete overview of the data collected on the current state of the TGs (i.e. upon which the BMC is based) and the TGs' future plans (i.e. the IP). Finally, in section 4 a short discussion and main conclusions of the activities carried out in task 2.2 are provided.

2. Approach

The approach for developing deliverable D2.2 builds on the work done in deliverable D2.1 *Playbook to guide the set-up of testing grounds and the co-design of business model(s)* (Cillen et al., 2023). More specifically the steps taken during the set-up of the TGs and the co-design process of the business models presented in the Playbook are worked out in templates and canvasses adapted to the nature of the SoilValues project and ease of implementation by the TGs.

2.1 Set-up of Testing Grounds

In this deliverable, TGs play an important role. A TG is a farm or a number of farms in a specific partner country i.e. in a specific region which participate in SoilValues. There is a certain similarity of TGs with living labs (LLs), which will play an important role in the Soil Mission [1]. Both TGs and LLs work closely together with different (types of) stakeholders. However, LLs have a focus on 'technical' innovation whereas the TGs in SoilValues have a priority to develop sustainable SHBMs, i.e. including economic viability of their farming system with sustainable soil management.

Within each region where a TG had been set-up, the coordinating researchers and the TG-leads have reflected on potential cases to develop. Such cases are specific ideas for collaboration between land managers and stakeholders with the intention to create a conducive environment for delivering ecosystem services. TG-leads have been supported to carefully select cases using the questions included in Table 1.

Table 1. List of questions used to develop cases in the SoilValues TGs

Topic	Question
Overall information	Name of the case? * (for the definition, see the end of this form)
	What is/are the purpose(s)
	Which particular soil care practice(s) is (are) pursued or supported by the case?
	To what extent is the case already operational? How mature is the case?
	What are the geographical characteristics of the case (scale, operating area, soil type, climate, agricultural region...)?
Actors	Who initiated the case?
	Which actors are already involved in the case?
	In what way(s) are farmers involved?

[1] A citation from the website of EU Missions (Soil Deal for Europe; https://mission-soil-platform.ec.europa.eu/living-labs): 'The Mission Soil will put in place a network of 100 Living Labs and Lighthouses in rural and urban areas by 2030 to support the transition towards healthy soils. Living Labs and Lighthouses play a crucial role in accelerating the adoption of sustainable practices by users and in fostering the development of solutions tailored to specific local conditions.

Mission Soil Living Labs are user-centered, place-based, and transdisciplinary research and innovation ecosystems that involve multiple partners (e.g., land managers, scientists, citizens, businesses, and local authorities) to co-design, test, monitor and evaluate solutions in real-life settings for improving soil health.'

Value	Who is (will be) paid/rewarded by the (imagined) business model (sum up, e.g. farmers, MRV services, are there any non-paid involvements…)?
	What resources are mobilized by the case to enable the soil care practice (e.g. private money, loans, subsidies, access to land, infrastructure...)?
	By whom?
	In what ways are the outcomes of the soil care practice already being monitored?
	Is there any historical soil data available on the case?
	Can new soil data be expected during the SV project?
SoilValues level	Why is this case relevant to the SoilValues project as a whole (according to you, as a TG lead)
	'Burning question': What is the common purpose of the stakeholders of further developing this case as a business model

On 12/06/2023, an online workshop was held to do a final selection of cases with all TG-leads, facilitated by EV ILVO. The objectives were:

- to have a diversity of cases project-wide;
- to ensure the involved actors are sufficiently engaged and motivated;
- to ensure the cases are sufficiently innovative; and
- to ensure the relevance to the SoilValues project.

2.2 Co-design of business models

In preparation for the annual SoilValues consortium meeting and TG field visit in Aarhus (24/10/2023 to 27/10/2023), EV ILVO supported TG-leads in performing an actor and needs analysis and a SWOT analysis for their selected cases, as described in D2.1 (Cillen et al., 2023). TG-leads were provided with Excel-templates with definitions, examples and guiding questions. These templates were presented and discussed with TG-leads during an online meeting.

Actor and needs analysis

The stakeholder analysis helped TG-leads identify current and potential stakeholders through a self-assessment, estimate the relative interest and influence of stakeholders regarding their individual case, and describe the most prominent factors that drive existing collaborations and possible points of conflict. This analysis supported the TG-leads in engaging with stakeholders within the actual TG but also supported in reaching out to actors to include in the Community of Practice (CoP; WP3).

To structure the identification of stakeholders, TG-leads were provided with some guiding questions:

1. Who has the knowledge you will need?
2. Who has the influence you will need?
3. Who might provide the services you will need?
4. Who has the resources you will need?

5. Who might finance your Soil Health Business Model (SHBM)?

Next, stakeholders were plotted on an interest-influence matrix to distinguish Context setters, Key players, Crowd and Subjects (Figure 1). TG-leads were then advised to inform the Crowd, consult the Subjects, involve the Context Setters and collaborate with the Key Players (Figure 2).

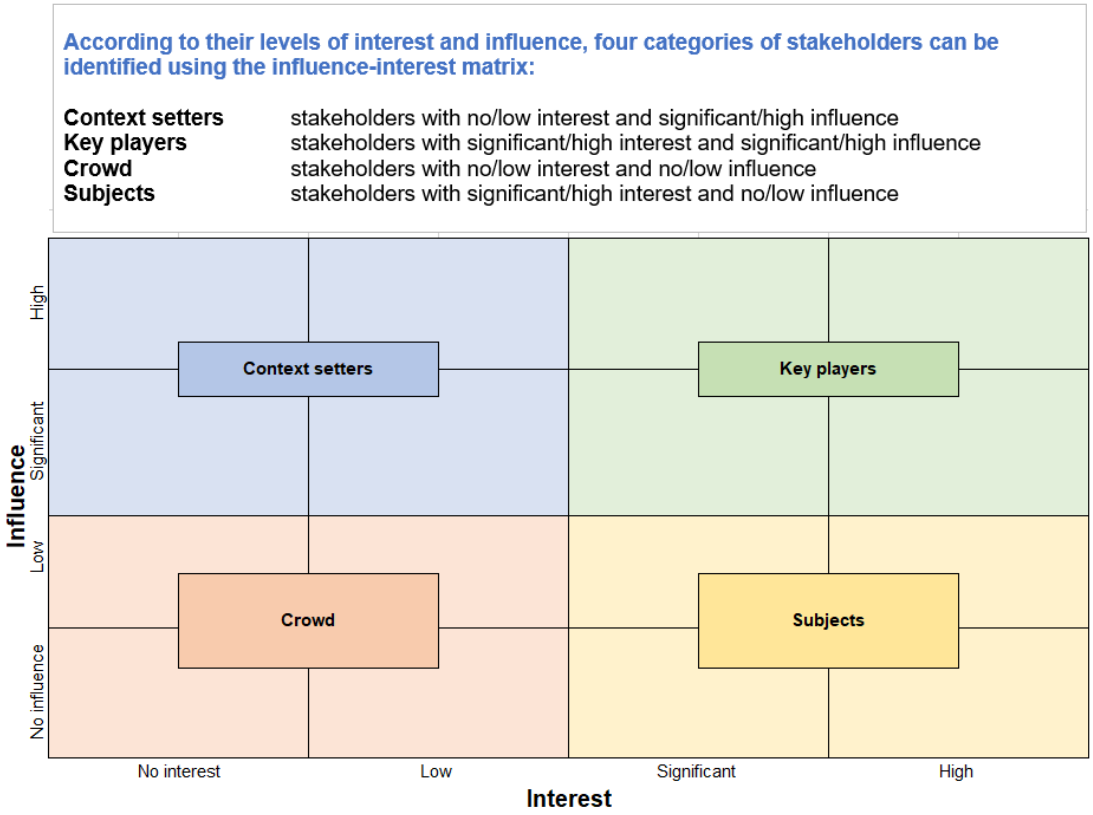

Figure 1. Interest-influence matrix used to categorize types of stakeholders based on their estimated influence and interest by TG-leads (no interest/influence, low, significant, high)

Using this approach, it is then possible to better tailor levels of stakeholder engagement to different stakeholder groups:

Inform – adequately update ***the crowd*** with balanced and objective information to assist them in understanding the concept of the SHBM and its relevance in agricultural management, the goals of the SoilValues project, the solutions it advocates, the associated opportunities and risks. Information must however be tailored to stakeholder needs.

Consult – obtain feedback from and provide adequate information to ***the subjects*** on relevant aspects of the design, methodologies, analysis, alternatives, decision making, and desired outcomes of the project. Care should be taken not to overwhelm stakeholders with information outside of their area of interest.

Involve – work directly with stakeholders ***the context setters*** throughout the project lifecycle to ensure that their concerns and aspirations are understood, considered and, where appropriate, incorporated into decision making.

Collaborate – work in close partnership with ***the key players***, in relevant aspects of the decision making and implementation processes, including the development of alternative methods and the identification of preferred solutions or outcomes to ensure these stakeholders remain fully satisfied.

Figure 2. General advice given to TG-leads on how to approach the different categories of current and potential stakeholders in their TG, based on the existing knowledge on interest-influence matrices

In a final step, TG-leads were asked to describe the most prominent collaborations and/or conflicts between (groups of) stakeholders in their TG. Knowing which stakeholders already have a good relationship based on shared values and/or practices will allow the formation of coalitions during the

project. On the other hand, being aware of existing conflicts between stakeholders will allow for a more efficient management of the risks associated with their participation in the project.

SWOT analysis

A SWOT analysis is used to identify and analyse internal strengths and weaknesses and external opportunities and threats of the pursued soil health business model (SHBM). TG-leads held workshops with farmers and other stakeholders closely involved with the case. EV ILVO provided the following guiding questions:

Strengths:	The advantages you currently have of expect within your TG. What is currently going well? Do you have a good reputation and position on the relevant topics within your region? Do you have sufficient resources and expertise to handle this task?
Weaknesses:	The areas for improvement you can identify with your TG. What roadblocks and obstacles within your control do you foresee? Keep the discussion constructive. You are looking at your own project in a realistic way to improve the final outcomes.
Opportunities:	The situations in which you could apply your advantages and the situations you could create after tackling your weaknesses. Consider both the opportunities you can spot right now and the 'what-if'-scenarios. You cannot control opportunities, but you can pursue them.
Threats:	Where your eventual success is at risk due to external factors. Try to list all threats you can think of, and rank them in order of magnitude. As you cannot handle all threats to the success of your SHBM, this will help inform your actions on how to manage the biggest ones.

TG-leads were encouraged to pursue opportunities, address their weaknesses and make note of threats to their cases. The obtained insights were then shared between TGs and project partners across work packages to increase mutual understanding and decide on how to proceed with the next steps in the project, i.e., creating a BMC and an IP for each TG.

It was decided not to provide individual templates for a value, process and outcomes analysis (as first foreseen in the Playbook (D2.1)). Rather, these aspects (or building blocks) were included in the work to be done for the SoilValues BMC and an IP (see next section).

From Business Model Canvas to the SoilValues Business Model Canvas

The Flourishing Business Canvas (FBC) (Flourishing Enterprise Co-lab, 2024) was introduced in deliverable D2.1 (Cillen et al., 2023) as a visual collaborative tool to design business models and is described as an upgrade of the widely used BMC of Alexander Osterwalder (Upward, 2013). The FBC consists of three contextual systems: the environment, the society, and the economy; four perspectives: process, people, value, and outcomes; and sixteen building blocks with topics and questions to think critically about in a business model.

The FBC was selected for its ability to look at a business model and sustainability from a network perspective. The BMC considers only the perspective of one organization and focusses on who the customer is. Alternatively, the FBC allows to discuss the perspective of multiple actors. Another reason we looked at the FBC is that it includes, besides the economic perspective, also an ecological and an social perspective. Considering that the goal of SoilValues is to co-create business models with a focus

on soil practices and related ecosystem services, this added value is included in the business model. It is important to involve stakeholders early in the development process of business cases for sustainability to engage in the different elements of a business model, creating trust, supporting creativity and innovation, and identifying potential consequences of the proposed business activities.

Because of the extensiveness and complexity of the FBC, it was simplified and adapted to the SoilValues aims in the project and more concretely in this report. The result is shown in Figure 3. However, after a first attempt to complete the canvas for a specific case, it became evident that additional modifications were necessary to capture the multi-layered efforts needed to include soil health in an existing business model. The result of these modifications is shown in Figure 4 and Table 1. In general, there was a need to make the FBC more specific to soil characteristics and practices. For each category, a number of guiding questions and potential tools to obtain relevant information were given (see completed IP's in Appendix).

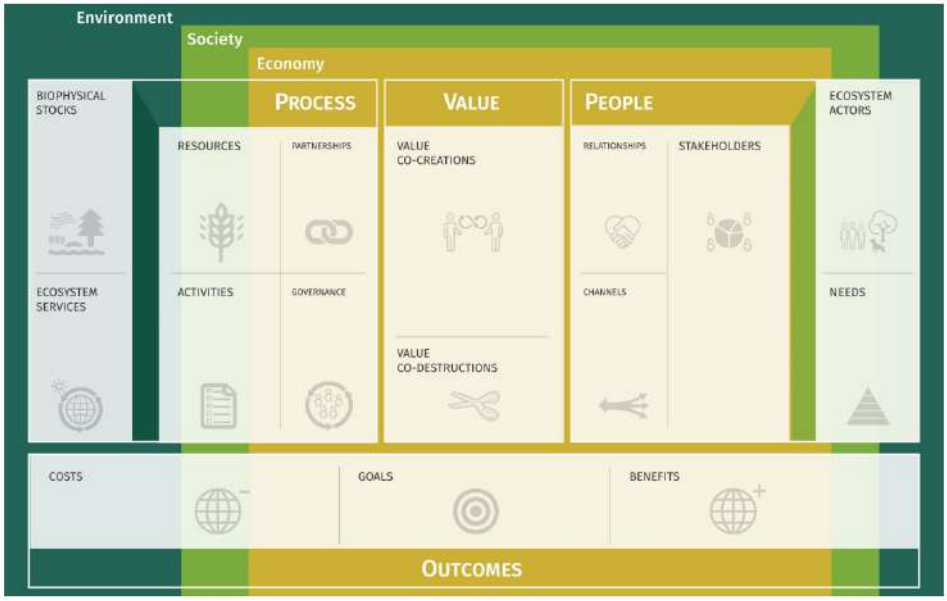

Figure 3. The Flourishing Business Canvas

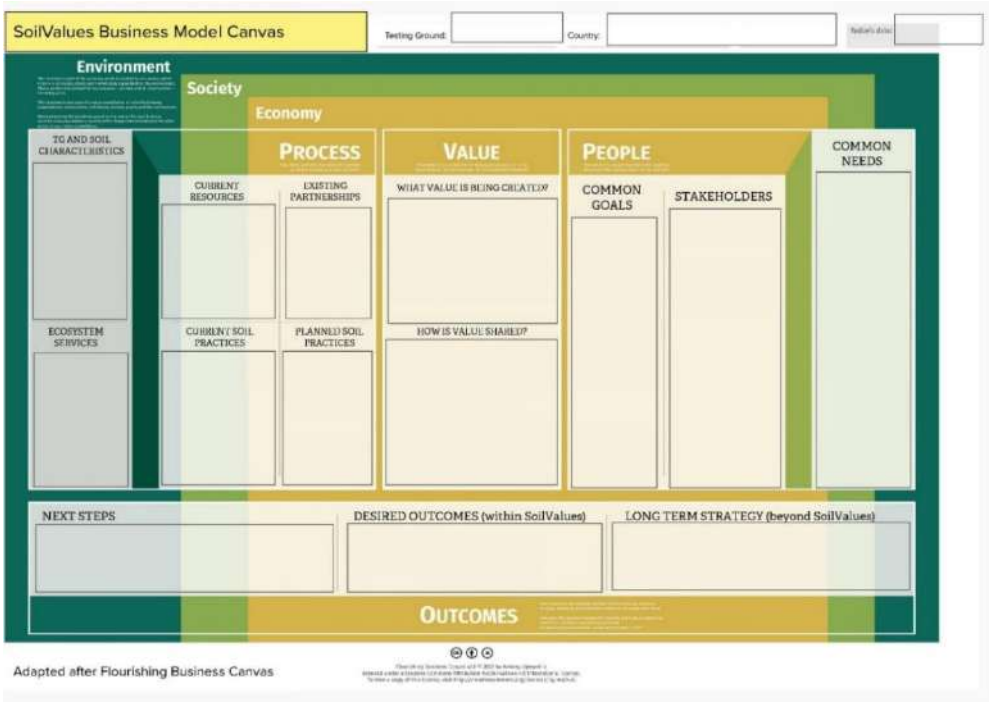

Figure 4. The SoilValues Business Model Canvas (adapted from the Flourishing Business Canvas)

Table 2. Modifications from the FBC to the SoilValues BMC leading to the format as presented in Figure 4

FBC	SOILVALUES BMC	EXPLANATION
Biophysical stocks	TG and Soil characteristics	Considering SoilValues language such as Testing Grounds (TG) and emphasize the importance of soils so that it becomes clear that the ecosystem services mentioned below are soil related.
Resources	Current resources	The Testing Grounds are involved in a co-creative process with numerous stakeholders. The resources which they possess at the making of these IP's and SVBMC's might change during the update in 2025 and 2026.
Partnerships	Existing partnerships	Similar to resources, we want TGs to reflect on the current partnerships which drive progress towards a SHBM. Future updates might describe how these have changed.
Activities	Current soil practices	More specific focus on soil.
Governance	Planned soil practices	While a clear governance is essential, this is partially captured by the categories of "TG (and soil) characteristics" and "partnerships." In addition, several TGs are still shaping their governance structures and would not be able to make full use of this building block. The importance of governance will be addressed through other means in the project, mainly by WP2 and WP3.
Value co-creations	What value is being created?	More simplified invitation to consider value creation from the perspective of different stakeholders.
Value co-destructions	How is value shared?	More simplified invitation to consider value distribution between stakeholders.
Relationships and channels	Common goals	More practical interpretation category to summarise individual and common goals based on specific stakeholders or, more generalised, stakeholder types involved.
Ecosystem actors and needs	Common needs	Complementary building block to 'common goals.' Simplification to remove the term 'ecosystem actors' as this might create confusion with the language of TGs and CoPs used in SoilValues.
Costs	Next steps	Most TGs do not have the ability to attach specific costs to their SHBM as there are still too many 'moving parts' or decisions to be made together with stakeholders. We opted for a more practical approach to describe concrete 'next steps' for each period (2024-2025, 2025-2026).
Goals	Desired outcomes (within SoilValues)	There is a need to distinguish the desired outcomes within the project duration with a long-term strategy for each TG. In this way, we emphasize that clear and realistic goals should be set on the development of regional projects within SoilValues, while also ensuring that regional projects have a clear direction even after the SoilValues researchers stop being involved.
Benefits	Long term strategy (beyond SoilValues)	

The adaptations and changes made create quite a different canvas compared to the original FBC. However, it answers the need within the project for a useful and pragmatic tool which:

- allows the diverse TGs to summarize and compare their process towards business models which include soil health improvements. This enables insight and planning of progress in each individual TG, as well as facilitating the co-designing process and shared learning between TGs;
- highlights the fact that including soil health improvements in the business model of a single case (e.g. a farm) implies it will also be included as an added value, cost or organizational change in multiple related business models belonging to stakeholders in the value chain;
- is adapted to the constraints of the SoilValues project and offers perspectives within and beyond the project;
- takes into account the high degree of uncertainty (economic, legal, societal, …) associated with the innovative nature of SHBM's.

During the remainder of the project, we will collect feedback on the viability of the SoilValues BMC for supporting land managers and their stakeholders in transitioning existing business models towards SHBMs.

Implementation plan

The IP is a document which follows the structure of the SoilValues BMC and provides guiding questions to each building block. If the SoilValues BMC is considered a summary, then the IP is the document where answers to each building block can be expanded on.

3. SoilValues Business Models Canvas and Implementation Plans for each Testing Ground

In this section, the six TGs are presented including their SoilValues BMC and the highlights of their IPs. The full IPs of the six TGs are included in Appendix.

3.1 Belgium: Composting at regional level in the Groot Saeftinghe area

Short description of the TG

This TG aims to create a composting project at a regional level which offers farmers an economically and ecologically interesting alternative fertilization strategy.

The TG aims, through the composting project, for a transition towards a more sustainable agriculture, and soil care in particular. The relevance of this TG within the SoilValues project is that it has an interesting (regional) scale to work with, with very clear soil practices and a focus on the ecosystem services delivered, a strong farmer involvement, indirect financial reward, engagement of public institutions through biomass flows and access to public land, and the actors involved themselves request the development of a business model.

The actors in the project are a number of organic farmers, a composting company, the province of Zeeland, and regional process facilitators. These organic farmers participate in ongoing experiments. Additionally, a handful of conventional farmers within the region are engaged in conversations about next steps. The idea in this TG is that compost application may reduce fertilizer needs and hence the cost of current inputs for regional farmers. It also contributes to soil fertility, structure, water retention capacity and hence productivity. However, the biomass inputs, composting activities and logistics will involve costs.

The composting company involved mobilizes own resources for rolling out the necessary infrastructure and for process management. Public institutions are involved for process management but also for producing, harvesting and storing biomass flows (e.g. through public management of green areas, public land).

SoilValues Business Model Canvas and implementation plan

The implementation plan of this TG is summarized in Figure 5. The common goal of the core group in this TG is to produce affordable, high-quality compost in order to improve the soil quality of the participating farms. This will lead to equal or lower costs with increased soil quality and compliance with environmental regulations. This TG wants to reach this goal in cooperation with different stakeholders, from farmers not directly involved to biomass actors, machine constructors, contractors, advisors and policy makers/governmental agencies. The project will create value for these stakeholders as well, for example it will lead to an improvement of biodiversity, environmental quality, and lower costs for regional actors, strengthening the regional identity. Their vision fits within a long-term strategy (beyond SoilValues) to keep biomass flows within the region (‘Grenspark Groot Saeftinghe’) to produce consistent amounts of quality compost. This will then be formally organized, for example in a cooperative with at least ten farmers, in which the stakeholders share the value created.

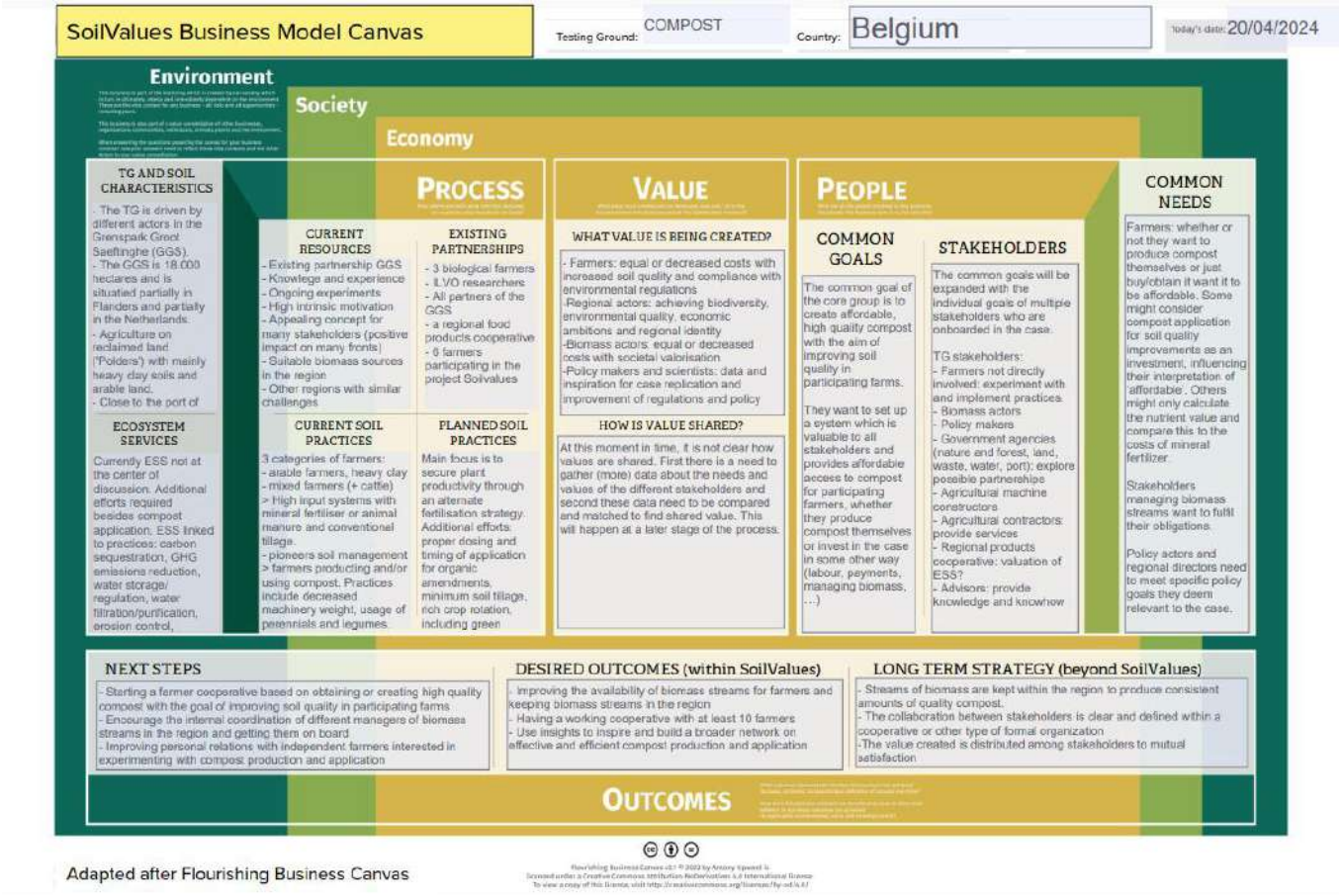

Figure 5. SoilValues Business Model Canvas of TG-Belgium

The first steps that this TG wants to take deal with the set-up of a cooperative and a network with farmers and other stakeholders interested and, on the farms, to change the fertilization strategy, improve the dosing and timing of application of organic amendments, and apply minimum soil tillage and a rich crop rotation including green manures.

3.2 Denmark: Grønne Mariendal– Peters Gartneri and Hedeskov

Short description of the TG

In Denmark, two farms are involved in SoilValues as TGs. The first is 'Grønne Mariendal– Peters Gartneri,' which is based around an initiative near Aarhus that applies regenerative farming and has a local communal direct customer-farmer relation. 100 Members pay on a yearly basis to either pick up or harvest vegetables or herbs themselves. The owners of this initiative do the sowing and maintenance (no-till and organic) to prepare for the costumers' harvest. Additionally, they sell courses in regenerative farming and host summer events.

The main actors in this TG are very much interested in a continuous discussion and cooperation with the SoilValues project. They are a good example of a soil-health initiative that is already exploring business and marketing models, while still being curious on developing further, so that main actors can live of their farm also without a job outside the farm. The main actors are the farmer/initiator/owner of the farm and a partner who is mainly involved in the marketing part of the farm. The development of the TG is supported by a community association, called c. The farmer carries out the farming practices, for example the crop rotation planning and the harvesting activities. He also teaches courses n regenerative farming to participants.

The FØJS-association and the marketeer are non-paid actors in the initiative, but the farm has 2-3 part-time employees. All the current actors, but especially the farmer, would profit from an MRV-cooperation with our project, so that he could prove his regenerative practice is beneficial to outsiders, such as funds, customers and public authorities.

The second Danish farm is 'Hedeskov' on Djursland, where the activities of the Hedeskov Center for Regenerative Practice (HCLS[2]) take place in the organization's own 150 ha of forest, bog, and meadow. The organization is interested in applying regenerative practices in a broader sense. Hedeskov will begin producing vegetables in the spring of 2024 in a market gardening manner, testing out a broad variety of soil health growing practices. They are interested to involve value chain actors that are interested in developing and supporting soil health practices. There are currently no farmers involved because the planned regenerative activities do not relate to agriculture but rather to nature management activities.

SoilValues Business Model Canvas and implementation plan

The IP of this TG is summarized in Figure 6. The common goal in this TG is to build a relationship with a CoP, to share their insights with CoP-members and to discuss how to go about crop rotation systems, business model planning and communication and how to navigate in a Community Supported Agriculture (CSA) setting. The idea is to create value through small-scale farming of high-quality vegetables in relationship with the local community and at the same time provide (other) meaningful ecosystem services, like improved biodiversity, CO_2-sequestration and of protection of groundwater from pollution. This would also create value for customers, for example community building and a closer connection of citizens to soil and health. Retailers could also create value through local commitment and selling local organic products. Cooperation between the farmers, the customers and the retailers

[2] In the past, HCLS stood for Hedeskov Center for Life Sciences. However, it has changed its official name to 'Hedeskov Center for Regenerative Practice'.

would be the heart of the TG, in which these values can be shared, also in communication with other stakeholders like the municipality. Recognition of ecosystem services in the value chain and by the municipality are part of this strategy.

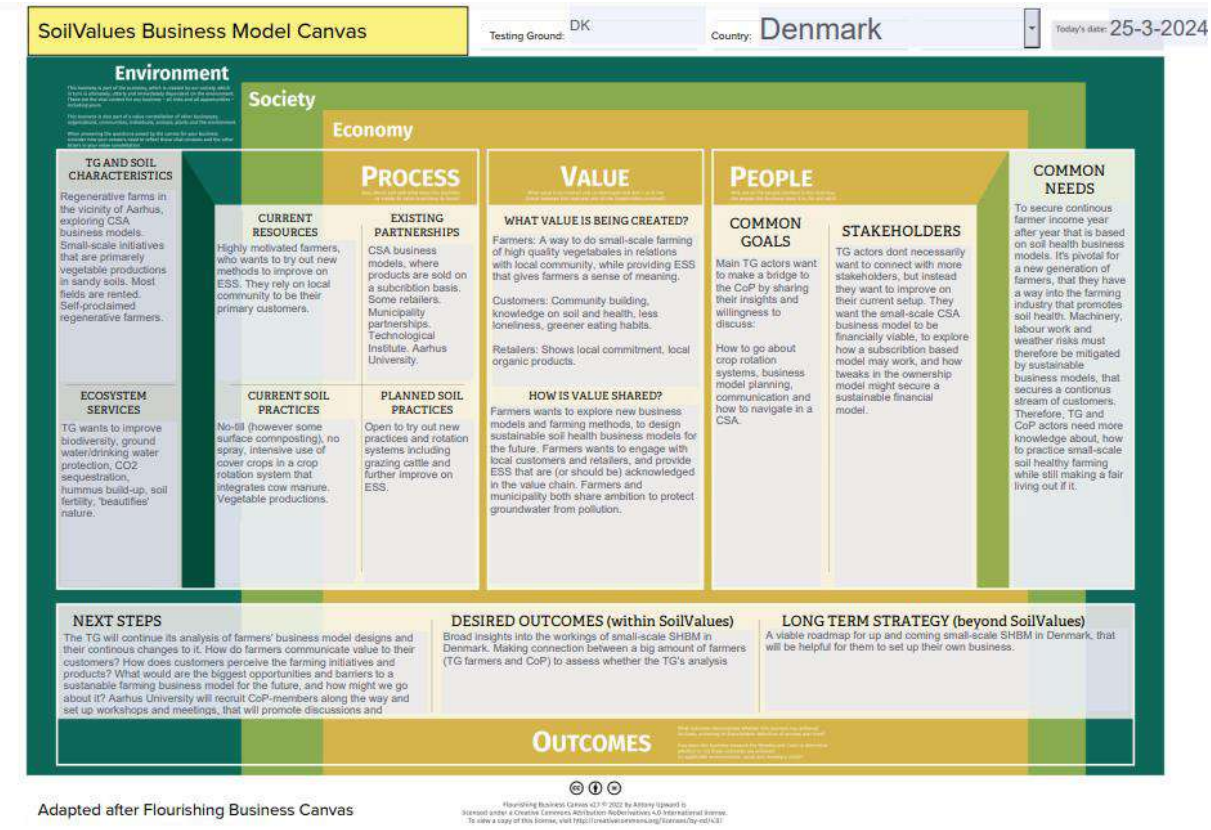

Figure 6. SoilValues Business Model Canvas of TG-Denmark

All building blocks of the IP should lead to a continuous farmer income over the years, i.e. a robust and sustainable business model. It is the long-term strategy of this TG to create a viable roadmap for upcoming small-scale SHBMs in Denmark, to help them to set up their own business. The next steps include further analysis and discussion with CoP members on such a roadmap for the two farms involved in this TG. At the farms, new practices and rotation systems including grazing cattle will be tried out and ecosystem services will be further improved.

3.3 Germany: Socially accepted value chain for healthy soil management on arable land

Short description of the TG

The main purpose of this TG in the North of Germany is to further develop and analyse a business model called 'Landwirtschaft Plus' with value chain actors and stakeholders that provide a fair and socially accepted price premium for soil health benefits. The purpose of the case(s) initially identified for the TG is to provide farmers with a price premium for fulfilling a set of criteria reflecting product quality and sustainable (healthy) soil management.

There is a high motivation of local actors with complementary roles and expertise for engagement in this TG. The TG is relevantly embedded in a local/regional network of sustainable value chains addressing soil management issues. It is also near a metropolitan region, providing context and opportunities to further analyse social acceptability of business model(s). In this TG, a working group operates which includes a range of value chain stakeholders from farmers to mills. Further stakeholders involved in the initiatives are the Chamber of Agriculture with its local offices and advisory services, the farmers union, the Raiffeisen-Cooperative, local associations such as the Climate Protection Agency Mittelweser, local authorities, and research organizations. The farmers in this working group are engaged in contract farming. These farmers receive a price premium. However, the business model must also be economically viable for other value chain actors such as mills. Society mobilizes its members to buy products of the mills and other value chain actors involved.

SoilValues Business Model Canvas and implementation plan

The implementation plan of this TG is summarized in Figure 7. The common goal in this TG is to transform towards more sustainable methods in agriculture through a regional cooperative, with a circular and economically feasible agricultural production of bioenergy. This should increase both soil health including nutrient management and the valorisation of ecosystem services and lead to the development of a knowledge network. The value created lies in a strong cooperation and networking between farms (conventional and organic dairy farms), biogas plants and other stakeholders like municipalities and citizens in this region. This should also lead to a larger scale of nutrient management and composting. Both the social and the technical aspects are not easily achieved by single farmers. Both values should also lead to economic value. The profit should be re-invested, and the knowledge shared among the TG-group. The awareness for soil health should be shared with a wider audience.

The long-term strategy of this TG is the transformation towards more sustainable methods in agriculture, with a focus on bioenergy production, soil health, environmental resources and climate protection. One of the starting points is an improved nutrient management through a more efficient use of manure, composting and humus creation. The next steps in this TG are the formation of a 'Landwirtschaft Plus concept'-group with all farmers involved and integration of this concept with value chain actors in a CoP, for scaling-up. More technical steps include soil data collection, identification of better soil management practices like composting.

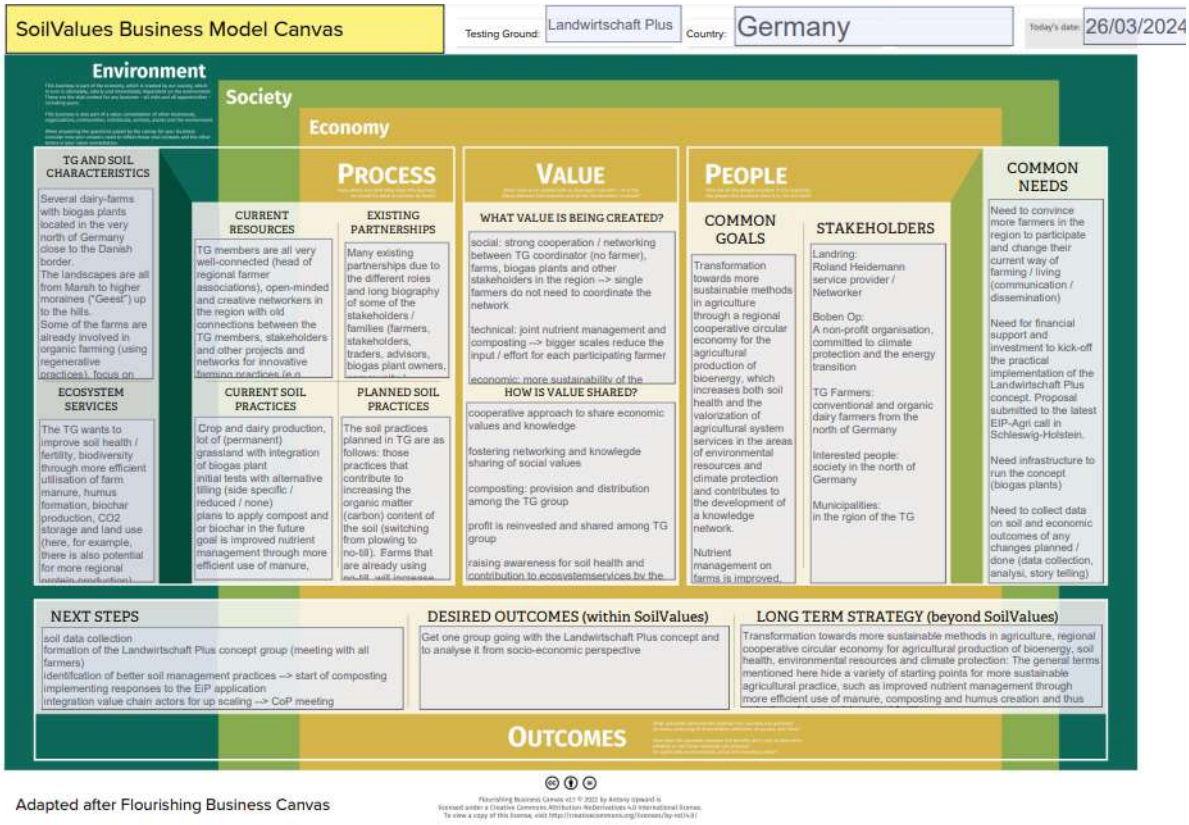

Figure 7. SoilValues Business Model Canvas of TG-Germany

3.4 The Netherlands: Citizens for healthy soils and farms

Short description of the TG

The purpose of this TG is transforming conventional agricultural land and practices into 'multifunctional community farms,' with regenerative farming practices, developing healthy soils and new business models for farmers. The two farms involved should become a showcase that social, ecological, and economic sustainability can be integrated. This TG stands out due to the active participation of citizens, who contribute both financially and with their time. Their holistic approach makes this TG relevant for the SoilValues project. It is also an inspiring case due to the active participation of citizen and NGO's as well as the challenge to discover whether the regenerative holistic approach is also economically sustainable.

The two farms involved in this TG are NGO's. Actors in this TG include several farmer families (more than one family on the Biesterhof), researchers, citizens, conventional farmers in the region, municipalities, the city of Nijmegen in one case and the city of Apeldoorn in the other, and a network of regenerative farmers. The farmers are the core of both farms: they have been selected by the NGO's to run the farm in line with regenerative practices. These farmers are financially supported by the NGO's, their members (especially during the first years of transformation of the farm), and surrounding community (volunteers).

SoilValues Business Model Canvas and implementation plan

The IP of this TG is summarized in Figure 8. The common goal here is to support farmers in the transformation phase towards a community farm with a sustainable business model. Additionally, they want to develop a good system to monitor the added value of the farms and to increase the number of community farms. The value added in this TG to produce good quality products, some with a label and to build up the experience of the community members involved. Other stakeholders, like municipalities and the NGOs Land van Ons/Lenteland should see inspiring examples of agricultural innovation and positive images, an improved nature and landscape quality, agritourism and new product lines. This value is shared with Land van Ons and Lenteland during and after negotiation about their support to the farms during the transition phase. The goal is to also add economic value to the products and share that with the local supermarket or retailer.

The long-term strategy of this TG is to increase the number of community farms and increase the support of communities, create sustainable business models and establish a strong movement of visible and nationally supported farms. The next step in this TG is to build a network with stakeholders and to build communities. They will also organize soil sampling to derive a baseline and organize sessions and exchanges to get more grip on farm economics. In a more practical sense, the TG-farms will apply limited soil tillage, solid manure, agroforestry/trees and nature elements. One of the farms wants to build a canal to get rid of excess of water in spring.

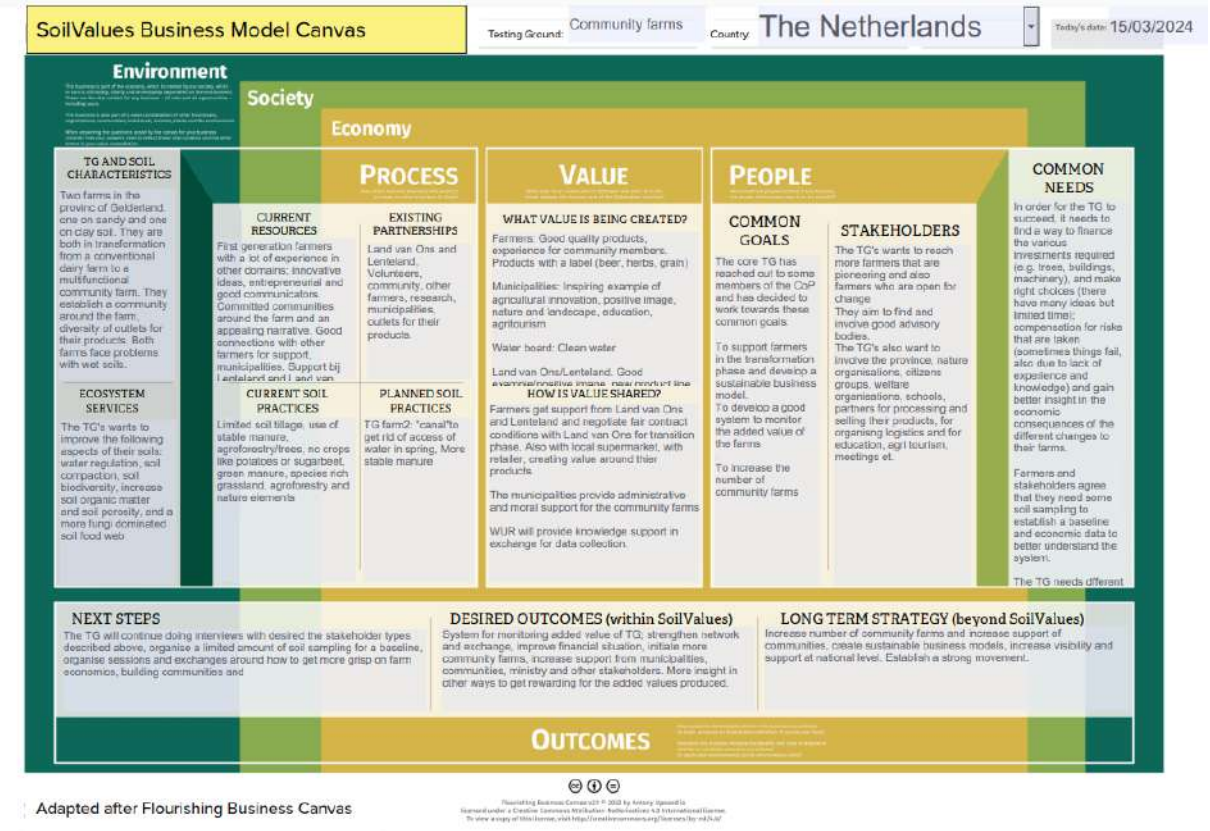

Figure 8. SoilValues Business Model Canvas of TG-the Netherlands

3.5 Poland: Sugar beet farming system

Short description of the TG

The purpose of this TG is the development of an insetting business model aimed at increasing incentives for regenerative farming practices – named by our stakeholders 'SoilProfit.' It focuses on the improvement of soil quality and achievement of optimal benefits for the actors involved in the value chain (e.g., remuneration for farmers, carbon footprint reduction, lower costs, and a positive image for processors). The purpose of the stakeholders for further development of the case is the improvement of soil quality, increased yields, and environmental protection (i.e., reducing greenhouse gas emissions in sugar beet production). Apart from the farmers, each SHBM actor (the sugar factory, the carbon certification company, the input providers, the advisors, the intermediaries, the consumers, and the financial institutions, the policymakers, and the NGOs) has an additional particular interest.

Currently there is no successful soil quality business model established in Poland. However, the case is supported by significant bottom-up model interest from various stakeholders, and they will help determine how to improve soil-based ecosystem services generated in Poland. In this TG, four sugar beet farmers in Southeastern Poland (Lubelskie and Lódzkie region), a sugar company (NordZucker), a carbon certification company, and a research institute (IRWiR PAN) are involved. These farmers are involved in all aspects of the TG and are part of The National Union of Sugar Beet Growers (KZPBC), which brings together about 20,000 sugar beet farmers. The farmers provide their own resources, partly from CAP payments and their know-how. The sugar processors provide knowledge, education, production inputs (seeds, pesticides, etc.), the KZPBC union image building, agricultural advisory, price negotiations, and contacts with policymakers. The farmers will receive money from carbon certificates and will have lower costs and higher profits in the future.

SoilValues Business Model Canvas and implementation plan

The IP of this TG is summarized in Figure 9. The common goals of the TG are a profitable and sustainable sugar beet production with emphasis on soil and product quality. The farmers in the TG want to gain knowledge from meetings held in the project, improvement of the soil quality and additional payments for carbon credits. The sugar factories want an improvement of the quality of the raw material (sugar beets), maintain or expand their market share among beet growers and purchase greenhouse gas emission reduction certificates from farmers. The value created in this project is in line with these common goals. Besides, certification companies may get in contact with farmers as potential partners. The stakeholders in this project have been working together before the start of the project, so the process of sharing value created has already started several years ago.

The long-term strategy of this TG is to increase carbon sequestration in the soil and to launch a market for trading carbon certificates. The first steps were soil sampling at four farms in March 2024 and a meeting in May 2024 with all partners about innovative soil cultivation technologies. The farms involved already apply soil testing, crop rotations according to agrotechnical principles, no-till cultivation (3 farms) and carbon farming. They have planned to apply practices to increase the organic matter content of the soil.

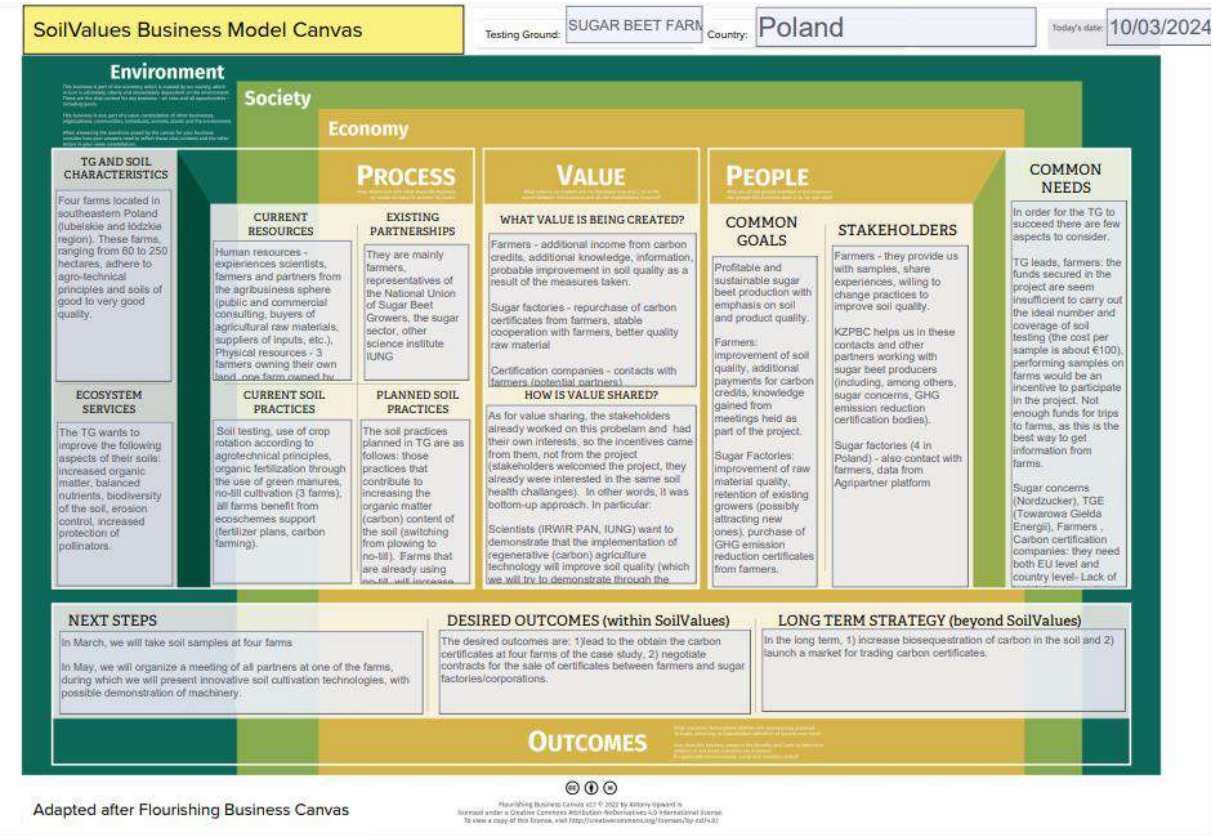

Figure 9. SoilValues Business Model Canvas of TG-Poland

3.6 Portugal: the Montado system

Short description of the TG

In this TG, a model for regenerative soil farming practices is developed, with the option to provide incentives according to objectives, with positive effects not only for the farmer but also for the image of the Montado agroforestry system. Initially, the focus will be on increasing land cover through grassland management. The common purpose of the stakeholders for further development of the case is improvement the of soil quality and health of the Montado system and environmental protection (i.e., to balance the greenhouse gas emissions with grasslands rich in legumes). This case study will help to improve the overall condition of the system and diversify the ecosystem services it delivers. It can further lead to establishing a model of regenerative agronomic practices to improve the soil, particularly with the management of grasslands. The actors in this TG are a farmer and a company with expertise in grassland management. This farmer is involved in all aspects of the TG and rewarded.

SoilValues Business Model Canvas and implementation plan

The IP of this TG is summarized in Figure 10. The common goals of this TG are to produce oak in the most sustainable way possible, to guarantee good soil health practices, to take the advantages of the regional characteristics of the soil and the climate, to keep a sustainable and natural livestock production and to learn what are the best practices to achieve optimal cork production. Next to research institutes and other farmers, Amorim S.A. is an important stakeholder, which provides fields and managers with experience in agroforestry. In a later phase, a CoP will be organized with additional stakeholders. The value created in this project is strengthening the farm's productivity while retaining its value, like its infrastructure, management and reputation, production of local products, soil quality and knowledge of cork production. This value has already been shared with Amorim since they are involved in all aspects of the value chain.

The long-term strategy of this TG to organize carbon auditing and possible connections to voluntary or regulated carbon markets. If the changes planned show to be economically viable and good for the environment, then they can be implemented at a larger scale. The next steps that the TG wants to take are the establishment of a relationship with a specific research community in Portugal, to analyse studies that have been carried out concerning practices and adaptation of the work package needs to the Portuguese TG. The farms in this TG do not use machinery in the cork oak forest, to prevent damage to the roots and to keep the soil stable. They do use organic or natural fertilization. They have planned to stop grazing some parcels to see the effects on soil health. Another idea is to increase the number of oaks and to test other practices, considering soil structure, soil organic carbon, plant productivity, and water retention capacity.

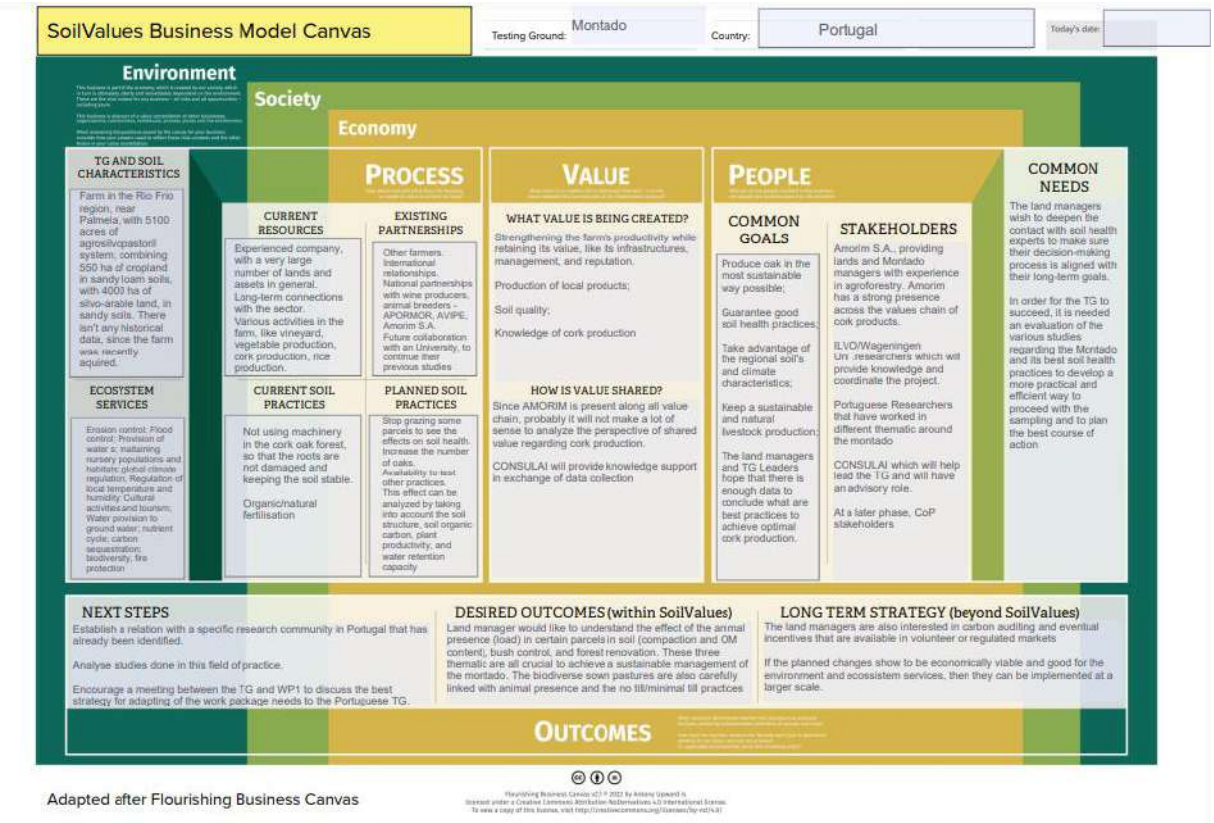

Figure 10. SoilValues Business Model Canvas of TG-Portugal

4. Discussion and conclusions

The development of the SoilValues BMC shows that the approach is suitable to present and summarize a large amount of data and information obtained from the TGs in a concise and systematic way. Moreover, it proves to be a useful tool in the contacts and discussions with the TGs. After having obtained the SoilValues BMC information from each TG, a first analysis of the TG regarding current state and future development could be made. This resulted in the SWOT-analysis and the co-design of the IP. All these are the basis for the current deliverable D2.2.

The six TGs differ largely in farm structure (farm size, cropping plan, herd size, soil type, etc.), market orientation (delivery to a cooperative, home selling/direct selling to cooperative members, selling through a short value chain), value proposed (besides products also additional ecosystem services, courses, excursions, etc) and farm strategy (conventional, organic, or regenerative production). This implies that there are also large differences in the change of soil management practices that the TGs have planned compared to the traditional soil management practices in their neighbourhood. Growing more cover crops and reducing tillage are clearly less radical changes than the transition towards an organic or regenerative farming system that imply a big shift from large scale commodity crop growing to vegetable, fruit and herb growing with different market channels. What all these TGs have in common is their focus on improving soil health, their conviction that this will also lead to an increase in ecosystem services (besides production of food, feed, or raw materials) and their search how to get a reward for these ecosystem services resulting in a solid business model, so that they earn a good income. For each individual TG, these ideas and plans are reflected in the tailor-made IP.

The approach followed proved useful in conducting participatory research on business model development (particularly) for regenerative farms. The holistic approach, taking account of (presumably) every issue of importance and concern allows developing a clear picture of the situation at the beginning of the business model developing process. In this way, a sound basis for further continuation of the participatory research and business model development has become available.

The current state is that all six TGs are well established, and that the information basis is available (SoilValues BMC and IP). This provides a sound basis for the upcoming research on implementation of the proposed plans and changes, as well as other analyses. All these activities will be carried out during the remainder of the SoilValues project, i.e. co-designing of business models for soil health within the TGs; implementation, monitoring and improvement of these business models; development of a prototype framework for evaluation; and bio-economic analysis of important evaluation criteria and framework validation. They will use the information described in D2.2 as a baseline for future comparison and analysis.

Regarding this deliverable, it can be concluded that the intended aims have been obtained, i.e.:

- All six TGs have been well established;
- For each TG, a sound baseline for further development of the business model is available in the form of a completed SoilValues BMC and IP;
- For each TG, a sound baseline for follow-up and analysis within the SoilValues project is available in the form of a database for reference.

Acknowledgements

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Grant Agreement: 101091308

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Appendix A: Belgian Testing Ground Implementation Plan

If you have multiple distinct 'cases' or 'operations' in your TG, we recommend creating separate implementation plans and Business Model Canvasses (BMC's). Other suggestions or solutions are welcome.

Country	Belgium
Testing Ground lead(s):	Hans Vandermaelen
Author(s) implementation plan:	Lene Cillen, Ennio Facq, Sylvie Fosselle, Hans Vandermaelen

Background Information

This implementation plan follows the same structure as the SoilValues Business Model Canvas and allows for further elaboration on the summarized information you put in the SVBMC. It consists of two main sections: 1) Current situation and 2) Planned changes and desired outcomes. Each has their own subcategories for which we have provided guiding questions, possible tools to obtain answers and an example answer from the fictional PolderPotato TG. **Please only add the tools you have used or intend to use for your TG in the finished implementation plan.**

The implementation plan and the SVBMC will need to be periodically updated (e.g. before partner meetings). This first version will serve as input for deliverable 2.2 (deadline 30/04/2024). Each subsequent update will reflect the available information on the situation at a specific time in the project, as well as an opportunity to adjust the planned changes and desired outcomes based on the dynamics and progress in your TG.

You will see that in the tools different methods are described. We want to be clear that we do not expect the TGs to do all these things in February/March. For this first version of the implementation plan it will probably be easiest to formulate a more general answer to the questions by discussing this in your TG stakeholder group. If you are already planning interviews, you can use those to gather some more information. The implementation plan will be a dynamic document during the project, so it is logical that over the years everything will become clearer, interviews or focus groups will be planned and all the work will contribute to new and more concrete versions of the implementation plan.

Current situation

TG and soil characteristics

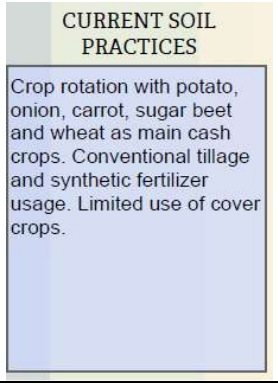
Guiding questions	Who is managing the soil involved in the TG? What are the most relevant soil-related characteristics of your TG? E.g. surface area of farms, current management type, soil quality indicators the farmers are interested in, state of degradation of the soils, … What other elements define your TG? What are the main drivers from you and your stakeholders in trying to go towards a SHBM?	**Example of summarized answer**

Tools	Soil data talks and collaboration with WP1, TG leads meetings, conversations with farmers, stakeholder interviews and meetings	TG AND SOIL CHARACTERISTICS Four farms in the polder region of West-Flanders with light to heavy clay soils and a combined area of 85 hectares of cropland. The soil has a degraded soil fertility compared to historical data and was compacted during wet harvesting last season.
Answer(s):	The TG is driven by independent farmers active in the 'Grenspark Groot Saeftinghe' (GGS), which is a regional collaboration between farmers, public institutions, nature conservation organizations and the Port of Antwerp. The GGS encompasses about 18.000 hectares and is situated partially in Flanders (province of East Flanders), partially in the Netherlands (province of Zeeland), within a historic region defined by agriculture on reclaimed land ('polders') with mainly heavy clay soils and arable farming. To a lesser degree, cattle farming is also present in the area. In the southern, Flemish part of GGS, sandy soils are also present. The region is further marked by infrastructure and activities from the Port of Antwerp, tidal habitats, and numerous small landscape elements (e.g. rows of trees along dikes, ditches with reed vegetation, hedgerows, …). Projects for nature restoration and conservation are often funded by industrial activities from the nearby port (e.g. because of nature compensation regulations). Due to the rich and fertile nature of the clay soils, soil quality has not received much attention so far. However, farmers in the region have indicated concerns over current and potential productivity decreases due to soil degradation. Additionally, farmers have expressed concerns about compliance with environmental legislation under currently popular fertilisation strategies (i.e. usage of mineral fertilisers and inversion tillage). As a potential solution for both issues, a small group of local farmers, researchers (ILVO), advisors, governments (province Zeeland) and GGS regional managers are exploring options for regional production and application of compost as organic fertilizer. Besides an alternative fertilisation strategy, other drivers for farmer participation are the perceived advantages at the farm level, such as the autonomy and future-proofness of the farm by reducing the dependency on external inputs and meeting societal and policy expectations. The economic feasibility of the potential changes in farm management is clearly a deciding factor for acceptance by participating farmers. However, it is too early in the process to be able to calculate and compare costs for specific composting systems. First, decisions need to be made on how needs, goals and resources will be matched among stakeholders within the TG and how decisions on shaping the composting system will be organized (governance). Data for the evaluation framework of the SHBM (WP1) will be gathered at one farm using the questionnaire provided, though multiple farmers have shown interested in	

	monitoring soil- and compost quality in various experimental setups to provide insights which will help shape the regional composting system. We have not collected data (yet) about the regional trend in soil degradation, so the current assumption is that this trend is in line with the Flemish average (which is a steadily decreasing soil quality) based on the farming practices used (see next section).

Current soil practices

You can add non-soil related practices if they help explain the TG.

<table>
<tr><td>Guiding questions</td><td>Summary of soil management related farming practices in your TG.</td><td rowspan="2">Example of summarized answer
  </td></tr>
<tr><td>Tools</td><td>conversations with farmers</td></tr>
<tr><td>Answer(s):</td><td colspan="2">We distinguish three categories of farmers involved in the TG, in which we focus on the inclusion of soil quality in farm management.

1) Arable farmers on heavy clay
2) Mixed farmers (arable + cattle)

In general, farmers in the region employ farm management which is typical for Flanders. High-input systems with mineral fertiliser and/or animal manure and conventional tillage using heavy machinery. Farmers (particularly arable farmers) indicate they like or need the amount of control offered by easily quantifiable addition of nutrients using mineral fertilisers to meet expectations from contract farming or produce auctions. In addition, the heavy nature of clay soils makes them vulnerable to compaction, for which conventional or periodic deep tillage seem like easy solutions.

Legal requirements limit the amounts of allowed fertiliser usage and timing of application. Since 2024, crop rotation is mandatory to receive full CAP payments.

Popular crops in the region are potatoes, wheat, sugar beets, corn, grain, and onion. Cattle farmers have grazing animals to produce dairy and meat, such as cows and goats.

These farmers are not involved in the production of compost. They could have some knowledge and experience with the application of compost and other organic amendments, as well as farming practices which aim to increase soil quality. On the other hand, these categories also include farmers who are simply looking to gather</td></tr>
</table>

	some information on compost and the importance of soil quality or are looking for opportunities to buy affordable quality compost to replace mineral fertilisers. 3) **Pioneers or frontrunners with regards to farm management which improves soil quality** These farmers are already involved in the production and/or usage of compost. They might also apply wood chips or mulch to their cropland or grassland. They might be organic farmers, but do not have to be. These farmers have knowledge and experience on the relationship between things like soil structure, soil organic carbon (SOC) and plant productivity or water retention capacity. They can translate that knowledge into practical examples (e.g. observations on dry matter content of fodder from grassland with high SOC versus low SOC). Practices include decreased machinery weight, reduced tillage, usage of perennials and legumes for soil structure and green manure purposes, usage of cover crops, crop residue management to include residues in the soil, reduced/no mineral fertiliser application, and the application of organic amendments such as compost or solid manure.

Ecosystem services

Guiding questions	What are the ecosystem services that the TG is currently providing and would be interested in further exploring/improving/marketing/…? Why these ecosystem services? Is there a difference between which ecosystem services stakeholders want to focus on? If so, why is that? Do some stakeholders not want to work with ecosystem services? If so, why?	**Example of summarized answer** ECOSYSTEM SERVICES This TG wants to improve the following aspects of their soils: water regulation, soil compaction, soil biodiversity and soil porosity,
Tools	WP1 translates current soil practices into a set of ecosystem services. A selection could be made by TG leads, farmers and other stakeholders in meetings or focus groups.	
Answer(s):	As explained in the earlier section, we distinguish pioneers regarding farm management which improves soil quality and the average farmers with either arable farming or cattle farming as a focus. Currently, the concept of ecosystem services is not at the center of discussion. Instead, the focus is more practical and based on securing current and future plant productivity through an alternative fertilisation strategy which at least maintains the current soil quality and meets nutrient demands for economically viable farms. For many farmers, a key driver is the ever-shrinking legal space (e.g. via manure legislation) that makes the continuation of the current fertilisation strategy unfeasible and increases interest in organic fertilisation strategies.	

	The pioneer farmers and researchers involved emphasize the importance of a science-based approach. Specifically, the effectiveness of compost application will increase if the soil microbiology in the topsoil is stimulated to break down the applied organic matter into available nutrients for plants. In addition, an increase in symbiotic effects between fungi, bacteria and plant roots will improve plant productivity. Farmers should be made aware of the processes driving soil fertility and plant productivity to be prepared for effects which have been observed such as smaller plants with higher dry matter content and bigger root systems growing in soils with higher SOC contents. The visual impact of smaller plants might lead farmers to believe that their plant productivity has decreased, whilst this is not necessarily the case. This requires additional efforts besides compost application: - Proper dosing and timing of application for organic amendments (compost, solid manure, wood chips, …) - Minimal or appropriate soil tillage - Rich crop rotation, including green manure cover crops. The ecosystem services (ESS) linked to these practices are: Regulating services Carbon sequestration GHG emissions reduction at farm level Water storage and regulation Water filtration and purification Erosion control Biological control of pests and diseases Supporting services Creation of habitat for biodiversity Nutrient cycling Cultural services Recreational and aesthetic value (cover cropping vs bare fields) Provisioning services Plant productivity / yield In the coming period, it will be an interesting process to convince the more conventional farmers in the TG of the importance and necessity of this science-based approach to compost application for improving soil quality. It remains to be seen what sort of values and ecosystem services will arise as the most convincing drivers for them. This relates to the process of assigning and distributing value in the SHBM.

Current resources

These might be human resources (e.g. experience, expertise, inspiring people), physical resources (land under independent control, infrastructure to hold meetings), financial resources (additional subsidy opportunities, farms with some financial reserves) or other.

<table>
<tr><td>Guiding questions</td><td>What are some essential ingredients in your current TG that could lead to success? Why?</td><td rowspan="2">Example of summarized answer
  </td></tr>
<tr><td>Tools</td><td>TG core meetings and stakeholder consultation</td></tr>
<tr><td>Answer(s):</td><td colspan="2">An essential resource that can be used for the development of the soil health business model is the already existing partnership Grenspark Groot Saeftinghe (GGS). In this partnership, many social and governmental organizations have made a certain commitment to work on a sustainable relationship between port, nature, and agriculture in the region. With the composting concept, a concrete idea is now on the table to work on sustainable agriculture and healthy soils. Several partners of GGS could have a positive impact on the success of this concept (e.g. through the biomass streams they own, their contacts with farmers...). The commitment already expressed by these partners at the GGS level is an excellent starting point to exploit these potentials.

Furthermore, these elements from a SWOT analysis made in October-November 2023 are relevant here.

Internal strengths
• There is already knowledge and experience available from ongoing experiments.
• Ongoing experiments yield convincing initial results.
• The project has a positive impact on many fronts and can thus appeal to many stakeholders.
• There is high intrinsic motivation among various actors to develop the concept.
• Composting and an appropriate fertilisation strategy are not or rarely the subject of polarization and can thus appeal to both organic and conventional farmers.
• There are certainly suitable biomass sources present in the region.

External opportunities
• The (expected) positive impact of the project on many fronts (water, nutrients, climate, biodiversity, management...) offers many opportunities to involve policy actors.
• For farmers, participation in the composting project could be a way to enhance social recognition and appreciation in the area as well.</td></tr>
</table>

	• The GGS composting project will be closely and with great interest followed by other regions in the Netherlands and in Flanders, facing similar challenges. This provides opportunities to address external threats.

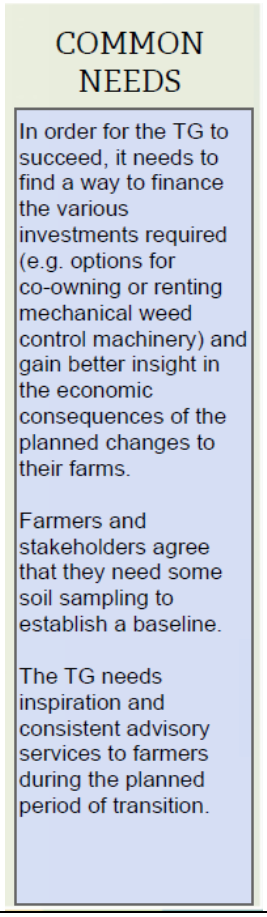
Existing partnerships

Feel free to add any other relevant information, such as existing collaboration between partners outside of the TG.

		Example of summarized answer
Guiding questions	Who would you consider your main partners in the TG now, and what is their main contribution? How clear is the collaboration currently? Does every partner know how and when to deliver on their commitments?	
Tools	TG leads identify the main partners driving the TG and what the focus of the collaboration is (with TG leads and/or between themselves)	
Answer(s):	The conversation about a composting concept in the GGS started small, building on some ongoing experiments on about three organic farms that were already being monitored and supported from the province of Zeeland. Initial discussions regarding a scaled-up composting concept across the entire region therefore started within a core group comprising these actors, supplemented by researchers from ILVO and the GGS network director on the Flemish side. See logbook for overview. These are the partners of the GGS: Port of Antwerp-Bruges, Natuurpunt Waasland, EGTS Linieland van Waas en Hulst, Stichting Het Zeeuwse Landschap, Provincie Zeeland, Provincie Oost-Vlaanderen, Agentschap voor Natuur & Bos, Maatschappij Linkerscheldeoever, Gemeente Hulst, Gemeente Beveren, De Vlaamse Waterweg. There is also a food products cooperative in the region in which several farmers are already involved. This cooperative ("Groot Saeftinghe Smaekt") may also offer opportunities. About six farmers from the region have applied to participate in the monitoring and guidance we can offer from the SoilValues project (they want to apply compost on their farms and/or because they want to produce compost). A key challenge for action research in 2024 is to further develop this group of actors (farmers, stakeholders, CoP actors).	

Common needs

The common needs are identified as part of the current situation. We propose doing this aspect in two steps: 1) Identify what each separate stakeholder needs or expect from the SoilValues project and the TG at this time, 2) Try to find common needs that multiple stakeholders can work together on which helps the TG progress in the immediate future.

<table>
<tr><td>Guiding questions</td><td>What are some essentials the TG needs right now to progress? Are these things stakeholders agree on? If not, where do the needs of your stakeholders differ?</td><td rowspan="2">Example of summarized answer
  </td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups (including CoP?)</td></tr>
<tr><td>Answer(s):</td><td colspan="2">The needs are addressed in the values part because they are strongly interconnected.</td></tr>
</table>

Planned changes and desired outcomes

Planned soil practices

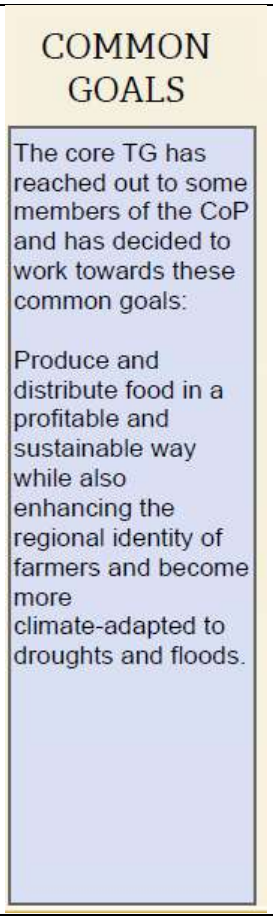
<table>
<tr><td>Guiding questions</td><td>What are the soil practices the TG has planned in going towards a SHBM? If no changes in soil practices are planned (e.g. when the aim is to valorise the existing ecosystem services provided) you could use this section to explain why.</td><td rowspan="2">Example of summarized answer</td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups.</td></tr>
</table>

		PLANNED SOIL PRACTICES Include promising varieties of potato in new system with minimal tillage, direct drilling after mulching cover crops (e.g. flax with deep root structure), solid manure fertilisation and mechanical weed control.
Answer(s):	As indicated before the focus within the testing ground is to secure current and future plant productivity through an alternate fertilization strategy. But it is important that farmers look at the bigger picture and search for practices that fit into this compost strategy. The effectiveness of compost application can be improved by considering the relationship between soil structure, soil organic carbon, plant productivity and water retention capacity. By applying different practices together (as a package) farmers can work towards better soil quality as well as better economic viability of their farm. Additional efforts should focus on: - Proper dosing and timing of application for organic amendments (compost, solid manure, wood chips, …) - Minimal soil tillage - Rich crop rotation, including green manure cover crops. Practices could include decreased machinery weight, reduced tillage, usage of perennials and legumes for soil structure and green manure purposes, usage of cover crops, crop residue management to include residues in the soil, reduced/no mineral fertilizer application, and the application of organic amendments such as compost or solid manure.	

Common goals

The common goals are identified as part of the planned changes. Like with the common needs, we propose doing this aspect in two steps: 1) Identify what the goals are for each stakeholder (or a selection of stakeholders) within the SoilValues project and the TG and 2) Combine these goals in some sort of 'mission statement' for your TG. If possible, you could also include goals from CoP members.

Guiding questions	What are the main goals your stakeholders (or each type of stakeholder) have within the TG? Can stakeholders formulate a 'mission statement' together, or do some of these goals contradict each other?	Example of summarized answer
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	

		
Answer(s):	The TG is in a phase of transition from the conceptual stage managed by the core group with consulting stakeholders to a more practical stage where roles and tasks are being divided. The common goal of the core group is to create high quality compost with the aim of improving soil quality in participating farms. They want to set up a system which is valuable to all stakeholders and provides affordable access to compost for participating farmers, whether they produce compost themselves or invest in the case in some other way (labour, payments, managing biomass, …) In the practical stage, this common goal will be expanded with the individual goals of multiple stakeholders who are onboarded in the case. This is reflected in the 'common needs' and value-related building blocks. All farmers, whether they want to produce compost themselves or just buy/obtain it want it to be affordable. Some might consider compost application for soil quality improvements as an investment, influencing their interpretation of 'affordable.' Others might only calculate the nutrient value and compare this to the costs of mineral fertilizer. Stakeholders managing biomass streams want to fulfil their obligations. They might be open to contributing to the common goal of the core group, but also must ensure they are financially and logistically viable. Policy actors and regional directors will define goals based on the specific policy goals they deem relevant to the case.	

Stakeholders

<table>
<tr><td>Guiding questions</td><td>What are the main categories and roles of stakeholders you are looking to involve to get the TG and CoP moving towards those desired outcomes and long-term goals?

What are some concerns or obstacles that would prevent you from involving these stakeholders?</td><td rowspan="2">Example of summarized answer

STAKEHOLDERS

The TG wants to reach more farmers, but are struggling to connect to conventional farmers. Also, they aim to involve farmer advisory bodies in a supporting role, but do not have the finances to pay them at this time.

Farmers want to explore talks with small-scale investors for the new machinery required for mechanical weed control. The retailer would like to connect to similar initiatives in Belgium or Europe. The province wants to connect with local nature-conservation groups to organise the agro-tourism walking route.</td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups (including CoP?)</td></tr>
<tr><td>Answer(s):</td><td colspan="2">TG core:
Stakeholders that initiated the testing ground with a high interest in composting strategies.

- Direct involved Farmers who want to optimize quality of compost: experiment with and implement practices.
- Grenspark Groot Saeftinghe: provide network in the region, overview of policy objectives in the region.
- Province of Zeeland: provide network in the region, overview of policy objectives in the region.
- ILVO-researchers: provide knowledge and monitoring, coordinate the project.

TG stakeholders:
Stakeholders that could get involved in the practical organization to move towards desired outcomes in the testing ground.
- Farmers in and around the Grenspark Groot Saefthinge not directly involved: experiment with and implement practices.
- Biomass actors, landscape managers: provide biomass for compost.
- Policy makers (national NL-BE, provinces, local): provide info on what is possible within the law.</td></tr>
</table>

	- Government agencies (nature and forest, land, waste, water, port): explore possible partnerships, investment in new composting strategy, allocate biomass streams. - Agricultural machine constructors: provide insight into what kinds of machines can be used or think about building something new. - Agricultural contractors: provide services - Regional products cooperative: valuation of ESS? - Other regional research and educational institutes: provide knowledge. - Advisors: provide knowledge and knowhow CoP stakeholders: Stakeholders that could get involved in lifting barriers for the testing ground to proceed and opening pathways to replicate the business model in other regions. - Farmers associations: informing farmers about composting practices - Biomass actors outside the park: provide biomass for compost. - Commercial composting companies: possible partnerships? - Policy makers: remove barriers - Government agencies (nature and forest, land, waste, water, port): scale up possible partnerships and compost strategy. - Research and educational institutes: provide and spread knowledge - Regional coordinators from other provinces and other parks: share relevant experiences - NGO's that have similar issues with valorising biomass streams - ...

What value could potentially be created by addressing the needs of the stakeholders?

The creation and distribution of value is a central aspect of the SoilValues project. From a research perspective, WP2 is interested in what various stakeholders find valuable and how this reflects on their willingness to commit resources and their values as organizations or human beings. However, stakeholders interacting with your TG are interested in more practical questions. This gives broadly two options in how to answer this question for a TG: 1) Directly ask stakeholders during a workshop or interviews and 2) identify and summarize stakeholder perceptions of value based on their stated preferences in the common needs, common goals, and other interactions.

In this first implementation plan this will probably be a more general description (see example). The more in-depth research we want to do on values within WP2, will be discussed at the next project meeting in Wageningen.

Guiding questions	What do the main stakeholders/stakeholder types find valuable in the planned changes? What kind of contributions would stakeholders make in exchange for changes they find valuable?	Example of summarized answer
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)- Economic data and bio-economic model WP1?	

		WHAT VALUE IS BEING CREATED? Farmers: cost-reductions, positive image and a perceived better food quality. West-Flanders province: water regulation, soil health improvements, agro-tourism, positive image. Retailer: positive image, new product line, potential for showcasing results to other farmers in their supply chain
Answer(s):	At this stage of the process, we can, based on the needs of each stakeholder, identify what value could possibly be created in this business model for them. We understand value as one or more needs are satisfied in the perception of a stakeholder. We will discuss the values and needs of the most important stakeholders. In a later stage we will also address the needs and values of other stakeholders such as contractors, machine constructors, other provinces, and parks, ... For the directly involved farmers value could be created when reducing their costs. They have lower costs for buying fertilizer and the logistic organization of bringing together local biomass streams for compost could also lower their costs for making good quality compost. It is also possible for costs to remain about the same, in which case the value created lies mainly with the improvements of soil quality in the new business model and increased ease of compliance with environmental regulations (which are becoming stricter). For the duration of researcher involvement, their need for monitoring and technical advisory services could be met without additional costs. For the Grenspark Groot Saeftinghe, and the province of Zeeland there is need for achieving biodiversity, environmental quality, water quality and economic ambitions in the region and thus value could be created by implementing this business model if many farmers will use qualitative compost, lower their costs, achieving good environmental quality and good produce. Biomass actors and landscape managers have a need for a low cost and societal valorised solution for the biomass streams. Value could be created when their biomass streams could be incorporated in the compost system. Policy makers (national NL-BE, provinces, local): need experiments and information on how regulations could be improved. This case could provide this to them and thus create value.	

How is value shared?

Guiding questions	How do you intend to link incentives with the planned changes? What do your stakeholders think about the division of created value between them?	Example of summarized answer HOW IS VALUE SHARED? Farmers want to negotiate fair contract conditions with the retailer, creating value around the new brand of 'Polderpotato' and resulting in sufficient price premiums being paid. The retailer wants to use this brand in regional marketing. The province will provide administrative support for the enhancement of regional identity. ILVO will provide knowledge support in exchange for data collection.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)- Linking up with WP4 regarding incentives and valuation?	
Answer(s):	At this moment in time, it is not clear how values are shared. First there is a need to gather (more) data about the needs and values of the different stakeholders and second these data need to be compared and matched to find shared value. This will happen at a later stage of the process.	

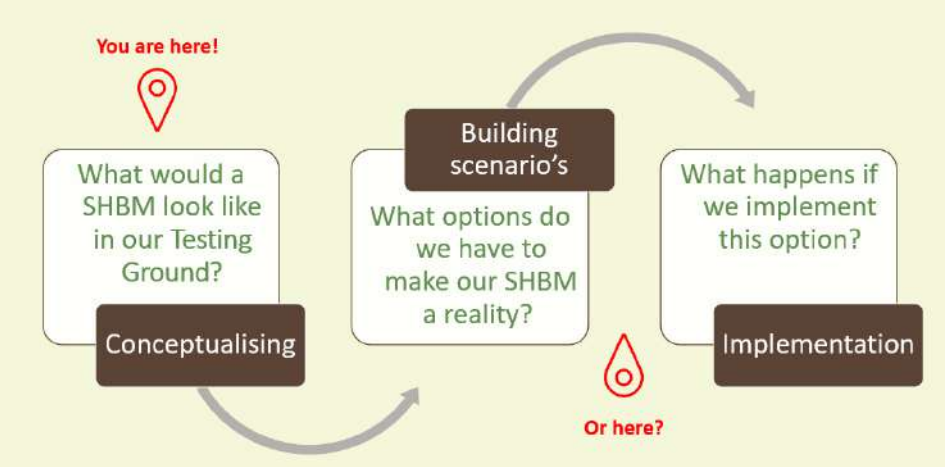
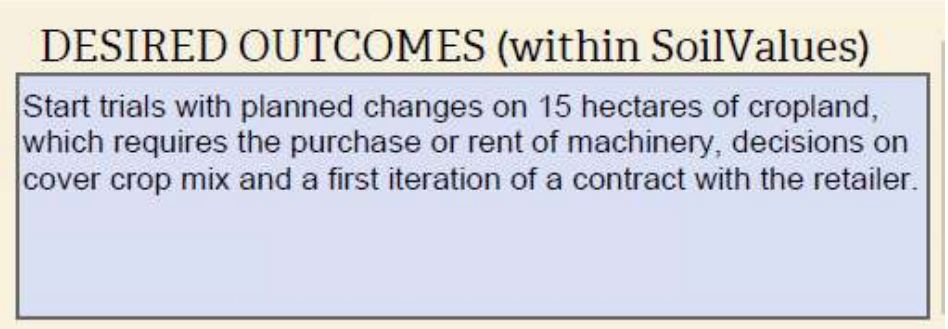
Next steps

Guiding questions	What specific steps will you be taking in the next period (e.g. between now and the next partner meeting) within your TG to address your common needs and work towards the common goals and desired outcomes?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders.
Example of summarized answer	NEXT STEPS The TG will continue doing interviews with the desired stakeholder types described above, organise a limited amount of soil sampling for a baseline, attend a demonstration event for the minimal tillage machinery and organise a focus group on the contract conditions for 'Polderpotato' products and the value of the brand 'Polderpotato'.
Answer(s):	In 2024, the TG will organize around 3 central processes to progress the case: • **Starting a farmer cooperative based on obtaining or creating high quality compost with the goal of improving soil quality in participating farms** There has been contact with an inspirational cooperative producing regional compost from The Netherlands called Agricycling. They have offered to share documentation on their organization and process. This will be analysed, summarized by ILVO and then shared for discussion with a group of farmers

	interested in starting a cooperative. Ideally, this will result in enthusiasm and a delegation of tasks to make the cooperative a reality (e.g. governance, legal matters, drafting of a mission statement, overview of necessary commitments from other stakeholders). • **Encourage the internal coordination of different managers of biomass streams in the region and getting them on board with the vision and goals of the farmer cooperative** There are several managers of biomass streams in the region. One of them is the Flemish Agency of Nature and Forestry, who are starting a local project involving a considerable amount of publicly owned land. In exchange for managing small landscape elements which provide habitat for the endangered bird *Circus aeruginosus*, farmers gain access to valuable farmland and the biomass streams therein. We would like to align the goals of this project with the vision of the composting case. Secondly, it would be valuable to consult and onboard the other organisations managing biomass streams in the region. We want to know what needs and costs they have and foresee. There has been a preliminary study on the quantity and timing of available streams, but insight into the evolution of their availability can only come through contacting these organisations. • **Improving personal relations with independent farmers interested in experimenting with compost production and application, while also obtaining generalizable data of use within and outside of the case** We have identified 5 or 6 farmers willing to work with ILVO to set up some experiments on compost quality, compost application and to take soil samples on their farms. These people are producing or want to produce compost at the farm level, and we can learn much on practical matters by interacting with them. Besides these 1-on-1 interactions, we foresee joint sessions for shared learning. In each of these processes, ILVO will identify the most urgent needs from stakeholders through interviews and discover how these needs can be met to create shared value. While the TG might progress faster if stakeholders can focus on separate issues at the same time, it will be important to maintain cohesion in the TG by organizing moments of feedback with all stakeholders involved.

Desired outcomes (within SoilValues)

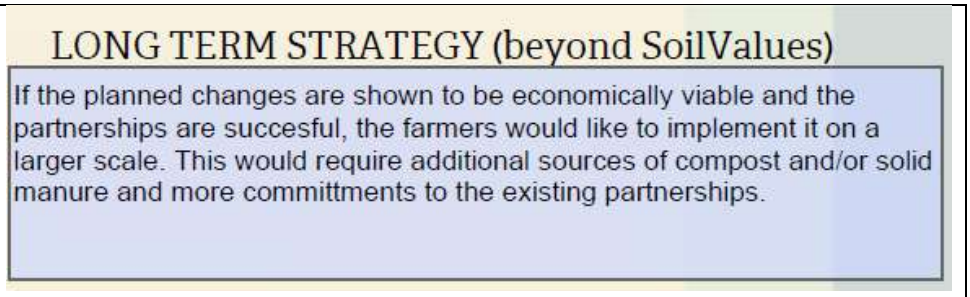
Guiding questions	In broad terms, what would your TG like to achieve by the end of the SoilValues project? What position would you like your TG to be at that time?

	
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	

Goals and strategy (long term)

Goals and strategies in the long term likely depend on achieving certain outcomes within the SoilValues project. In that case, you could formulate a conditional statement like in the example below.

Guiding questions	What would your TG like to achieve in the long run, going beyond the SoilValues project?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	

	
Answer(s):	Streams of biomass (from farms, landscape- and nature management) are kept within the region to produce consistent amounts of quality compost. This compost is produced by several independent farms and/or at a central location according to science-based protocols. This quality compost is applied at selected times and dosages to increase soil health in various farms within the region, alongside reduced tillage, and a rich crop rotation. The effects of increased soil health are monitored (through samples and/or farmer testimonials), and the project can inspire similar actions for increased soil health at the regional level. The collaboration between stakeholders is clear and defined within a cooperative or other type of formal organization. The value created is distributed among stakeholders to mutual satisfaction. In other words, participation in the composting network is worthwhile whether you are a supplier of biomass, advisor, farmer producing and applying compost, farmer buying and applying compost, policy maker, composting company, etc. What is 'worthwhile' will be understood differently by different stakeholders, but the important thing is that all business models involved are and remain economically viable after the inclusion of soil health improvements. This process might involve cost reductions, income improvements or just a shift in costs with different outcomes (e.g. paying for compost instead of mineral fertiliser, paying for composting of organic matter instead of 'dumping costs,' etc.).

Appendix B: Danish Testing Ground Implementation plan

If you have multiple distinct 'cases' or 'operations' in your TG, we recommend creating separate implementation plans and Business Model Canvasses (BMC's). Other suggestions or solutions are welcome.

Country	Denmark
Testing Ground lead(s):	Martin Hvarregaard Thorsøe & Kasper Krabbe
Author(s) implementation plan:	Kasper Krabbe

Background Information

This implementation plan follows the same structure as the SoilValues Business Model Canvas, and allows for further elaboration on the summarized information you put in the SVBMC. It consists of two main sections: 1) Current situation and 2) Planned changes and desired outcomes. Each have their own subcategories for which we have provided guiding questions, possible tools to obtain answers and an example answer from the fictional PolderPotato TG. **Please only add the tools you have used or intend to use for your TG in the finished implementation plan.**

The implementation plan and the SVBMC will need to be periodically updated (e.g. before partner meetings). This first version will serve as input for deliverable 2.2 (deadline 30/04/2024). Each subsequent update will reflect the available information on the situation at a specific time in the project, as well as an opportunity to adjust the planned changes and desired outcomes based on the dynamics and progress in your TG.

You will see that in the tools different methods are described. We want to be clear that we do not expect the TGs to do all these things in February/March. For this first version of the implementation plan it will probably be the easiest to formulate a more general answer to the questions by discussing this in your TG stakeholder group. If you are already planning interviews, you can use those to gather some more information. The implementation plan will be a dynamic document during the project, so it is logical that over the years everything will become clearer, interviews or focus groups will be planned and all the work will contribute to new and more concrete versions of the implementation plan.

Current situation

TG and soil characteristics

Guiding questions	Who is managing the soil involved in the TG? What are the most relevant soil-related characteristics of your TG? E.g. surface area of farms, current management type, soil quality indicators the farmers are interested in, state of degradation of the soils, … What other elements define your TG? What are the main drivers from you and	

	your stakeholders in trying to go towards a SHBM?	Two to three farms in the vicinity of Aarhus in Denmark. Mostly sandy loam. Around 30 ha in total among farmers. Soils have either not been farmed in recent history or they have been managed organically. Main interest of farmers is to grow vegetables and herbs for human consumption with regenerative practices. The farmers and our main drivers are to explore how regenerative farming can be done in a financially viable way.
Tools	Soil data talks and collaboration with WP1, TG leads meetings, conversations with farmers, stakeholder interviews and meetings	
Answer(s):		

Current soil practices

You can add non-soil related practices if they help explain the TG.

Guiding questions	Summary of soil management related farming practices in your TG.	Organic and diverse crop rotation on few hectares, with intensive use of cover crops, composting, and no-till. Cabbage, beets, carrots, squash, herbs, potatoes, leek, rhubarb, salads, pumpkins, onions etc.
Tools	conversations with farmers	
Answer(s):		

Ecosystem services

Guiding questions	What are the ecosystem services that the TG is currently providing and would be interested in further exploring/improving/marketing/…? Why these ecosystem services? Is there a difference between which ecosystem services stakeholders want to focus on? If so, why is that? Do some stakeholders not want to work with ecosystem services? If so, why?	Currently providing: Groundwater protection, no soil compaction, soil biodiversity, biodiversity above the soil with flower and nature strips, soil porosity, erosion control.

Tools	WP1 translates current soil practices into se t of ecosystem services. A selection could be made by TG leads, farmers and other stakeholders in meetings or focus groups.	
Answer(s) :		

Current resources

These might be human resources (e.g. experience, expertise, inspiring people), physical resources (land under independent control, infrastructure to hold meetings), financial resources (additional subsidy opportunities, farms with some financial reserves) or other.

Guiding questions	What are some essential ingredients in your current TG that could lead to success? Why?	Farmers driven by ideas about ideal food producing practices who also wants to engage with local communities. They are highly regarded by their local community, but need to find ways in which they can establish more sustainable business models. A subscription-based CSA-model is being practiced and its design is being discussed continuously to make it viable in the long run, which can be hard in terms of pricing, workload, visibility, and marketing. Farmers however have difficulties with ownership of the land, and some of them therefore rent the land, which comes with some complications.
Tools	TG core meetings and stakeholder consultation	
Answer(s):		

Existing partnerships

Feel free to add any other relevant information, such as existing collaboration between partners outside of the TG.

Guiding questions	Who would you consider your main partners in the TG now, and what is their main contribution? How clear is the collaboration at this time? Does every partner know how and when to deliver on their commitments?	Farmers, municipality, AU, customers. We are in close contact to the people in question, so the collaboration is clear. However, we try to reduce the amount of farm visits we do, to not induce a kind of 'informants' fatigue' on them that will obstruct our future collaborations.
Tools	TG leads identify the main partners driving the TG and what the focus of the collaboration is (with TG leads and/or between themselves)	
Answer(s):		

Common needs

The common needs are identified as part of the current situation. We propose doing this aspect in two steps: 1) Identify what each separate stakeholder needs or expect from the SoilValues project and the TG at this time, 2) Try to find common needs that multiple stakeholders can work together on which helps the TG progress in the immediate future.

Guiding questions	What are some essentials the TG needs right now to progress? Are these things stakeholders agree on? If not, where do the needs of your stakeholders differ?	

Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	In order for the TG to succeed, it needs to find ways to finance the various investments required to further develop on a sustainable business model. The TG needs more information on, how their business model and finances would develop over the next few years, depending on the exact B.M. farm owners chose to pursue. Farmers would ideally like to prove how their farm practices are improving soil health, but need documentation, which is expensive for smaller operations. As for now we, AU, serve as one of their inspirational gateways, where we provide them with feedback, perspectives, and elaborative questions that helps them clarify what they actually want to achieve and how they ideally get there, whereafter they can start operationalizing. So far, we have done interviews, workshops and attended business management meetings.
Answer(s):		

Planned changes and desired outcomes

Planned soil practices

Guiding questions	What are the soil practices the TG has planned in going towards a SHBM? If no changes in soil practices are planned (e.g. when the aim is to valorise existing ecosystem services provided) you could use this section to explain why.	

Tools	Stakeholder interviews, meetings and focus groups	Farmers are planning to further develop on their regenerative practices, and improve the ways in which they advertise their products, practices, and operations in general. Farmers will elaborate further on their cropping rotation system with cover crops, aftercrops, intercropping, surface composting and solid manure fertilization in their vegetable fields.
Answer(s):		

Common goals

The common goals are identified as part of the planned changes. Like with the common needs, we propose doing this aspect in two steps: 1) Identify what the goals are for each stakeholder (or a selection of stakeholders) within the SoilValues project and the TG and 2) Combine these goals in some sort of 'mission statement' for your TG. If possible you could also include goals from CoP members.

Guiding questions	What are the main goals your stakeholders (or each type of stakeholder) have within the TG? Can stakeholders formulate a 'mission statement' together, or do some of these goals contradict each other?	The main goals of the stakeholders are to increase soil health and grow sustainable business models, where farmers are financially rewarded in a reasonable manner, while the stakeholder Aarhus Municipality is very engaged in monitoring if regenerative agriculture, would protect the areas' ground drinking water. Both farmers and municipality are interested in sustaining a local food production, that involves community building.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	
Answer(s):		

Stakeholders

Guiding questions	What are the main categories and roles of stakeholders you are looking to involve to get the TG and CoP moving towards those desired outcomes and long-term goals? What are some concerns or obstacles that would prevent you from involving these stakeholders?	The TG wants to reach more farmers, but we struggle to find ones that are as interested in cooperating as those that are already involved. However, we have recently discovered a few farmer-initiated Danish CSA-farmer groups, that might be interested in becoming core members of the CoP to help model the project's outreach. Ideally we would want to engage +10 farmers working in related ways to our primary farmers, to discuss insights from the TG and see whether they are inspired to operationalize some parts of our main TG actors' SHBM. One obstacle will be to actually make those farmers willing to share ideas and insights with us, which requires us to design a collaboration that will be valuable to them as well.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	
Answer(s):		

What value is being created?

The creation and distribution of value is a central aspect of the SoilValues project. From a research perspective, WP2 is interested in what various stakeholders find valuable and how this reflects on their willingness to commit resources and their values as organisations or human beings. However, stakeholders interacting with your TG are interested in more practical questions. This gives broadly two options in how to answer this question for a TG: 1) Directly ask stakeholders during a workshop or interviews and 2) identify and summarize stakeholder perceptions of value based on their stated preferences in the common needs, common goals and other interactions.

In this first implementation plan this will probably be a more general description (see example). The more in-depth research we want to do on values within WP2, will be discussed at the next project meeting in Wageningen.

Guiding questions	What do the main stakeholders/stakeholder types find valuable in the planned changes? What kind of contributions would stakeholders make in exchange for changes they find valuable?	Farmers: Improved food quality and variety, more ESS, community engagement, food- and soil knowledge. Aarhus Municipality: Drinking water protection, soil health improvements, community building, local food system. Direct customers: Access to locally produced food, community building, knowledge on food systems, storytelling.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)- Economic data and bio-economic model WP1?	
Answer(s):		

How is value shared?

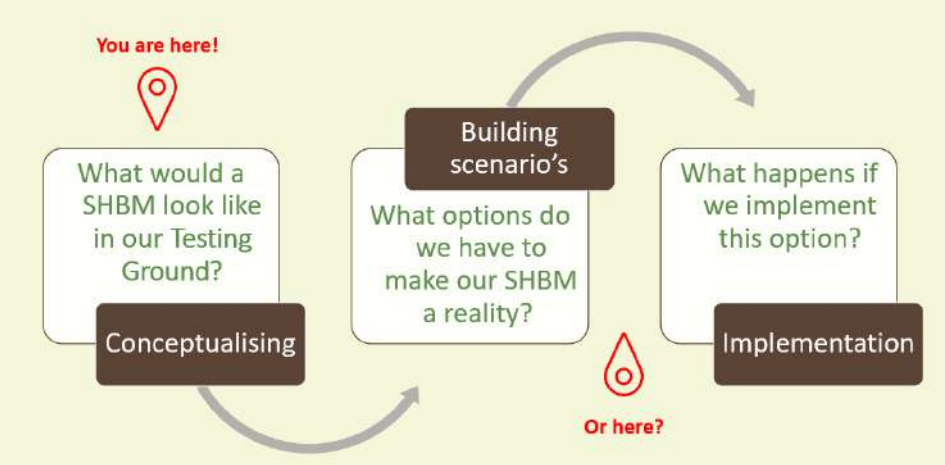
Guiding questions	How do you intend on linking incentives with the planned changes? What do your stakeholders think about the division of created value between them?	Values are generally shared among stakeholders. They all believe the ESS to be important, and having a local food system as well. AU will provide knowledge support in exchange for data collection.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)- Linking up with WP4 regarding incentives and valuation?	
Answer(s):		

Next steps

Guiding questions	What specific steps will you be taking in the next period (e.g. between now and the next partner meeting) within your TG to address your common needs and work towards the common goals and desired outcomes?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders

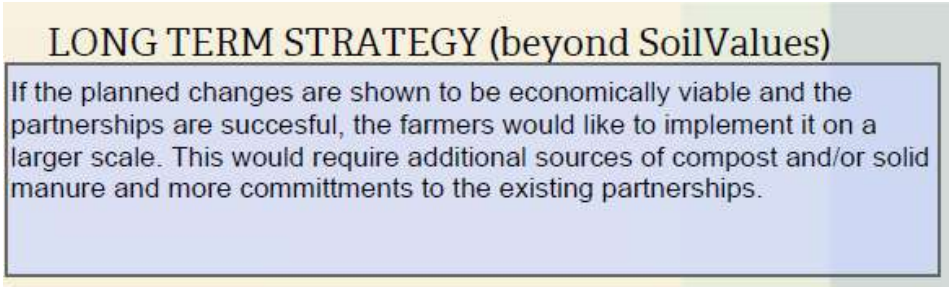
Example of summarized answer	The TG will continue to carry out interviews and study farmers' practice and decision making. We analyse how farmers try to up-scale their number of customers and how they price their goods, in order to be financially viable in the long run. We intend to find more relevant farmers that could partake in a CoP. Also we hope to expand a bit on the data collection methods, and map the farmers' soil health perceptions in an elaborate manner.
Answer(s):	

Desired outcomes (within SoilValues)

Guiding questions	In broad terms, what would your TG like to achieve by end of the SoilValues project? What position would you like your TG to be at that time? 
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	Follow how the current business model strategies will work out once implemented. Get detailed feedback from CoP members on the strategies and how they would assess their situation in relation to it.
Answer(s):	

Goals and strategy (long term)

Goals and strategies in the long term likely depend on achieving certain outcomes within the SoilValues project. In that case, you could formulate a conditional statement like in the example below.

Guiding questions	What would your TG like to achieve in the long-run, going beyond the SoilValues project?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	
Answer(s):	N/A

Appendix C: German TG Implementation Plan

If you have multiple distinct 'cases' or 'operations' in your TG, we recommend creating separate implementation plans and Business Model Canvasses (BMC's). Other suggestions or solutions are welcome.

Country	Germany
Testing Ground lead(s):	Marie von Meyer-Höfer, Gerald Schwarz, Roland Heidemann
Author(s) implementation plan:	Marie von Meyer-Höfer, Gerald Schwarz & TG group Landwirtschaft Plus

Background Information

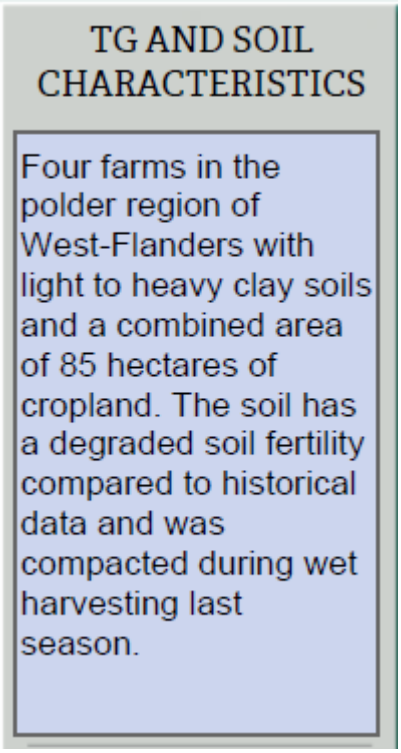
This implementation plan follows the same structure as the SoilValues Business Model Canvas, and allows for further elaboration on the summarized information you put in the SVBMC. It consists of two main sections: 1) Current situation and 2) Planned changes and desired outcomes. Each have their own subcategories for which we have provided guiding questions, possible tools to obtain answers and an example answer from the fictional PolderPotato TG. **Please only add the tools you have used or intend to use for your TG in the finished implementation plan.**

The implementation plan and the SVBMC will need to be periodically updated (e.g. before partner meetings). This first version will serve as input for deliverable 2.2 (deadline 30/04/2024). Each subsequent update will reflect the available information on the situation at a specific time in the project, as well as an opportunity to adjust the planned changes and desired outcomes based on the dynamics and progress in your TG.

You will see that in the tools different methods are described. We want to be clear that we do not expect the TGs to do all these things in February/March. For this first version of the implementation plan it will probably be the easiest to formulate a more general answer to the questions by discussing this in your TG stakeholder group. If you are already planning interviews, you can use those to gather some more information. The implementation plan will be a dynamic document during the project, so it is logical that over the years everything will become clearer, interviews or focus groups will be planned and all the work will contribute to new and more concrete versions of the implementation plan.

TG and soil characteristics

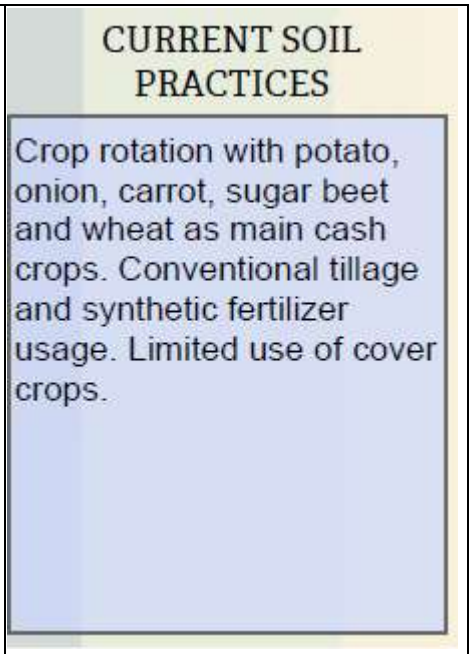
Guiding questions	Who is managing the soil involved in the TG? What are the most relevant soil-related characteristics of your TG? E.g. surface area of farms, current management type, soil quality indicators the farmers are interested in, state of degradation of the soils, …	**Example of summarized answer**

	What other elements define your TG? What are the main drivers from you and your stakeholders in trying to go towards a SHBM?	
Tools	Soil data talks and collaboration with WP1, TG leads meetings, conversations with farmers, stakeholder interviews and meetings	
Answer(s):	Several dairy-farms with biogas plants located in the very north of Germany close to the Danish border. The landscapes are all from Marsh to higher moraines ("Geest") up to the hills. Some of the farms are already involved in organic farming (using regenerative practices), focus on animal welfare / environmental protection / circular farming with the help of biogas plants. For detailed soil data: there are some farm individual data collected already, but not shared yet with us in the project. The idea for the future is to use digital tools (Apps) for soil / farm data management and to share these in the group to compare and benchmark among the TG group members.	

Current soil practices

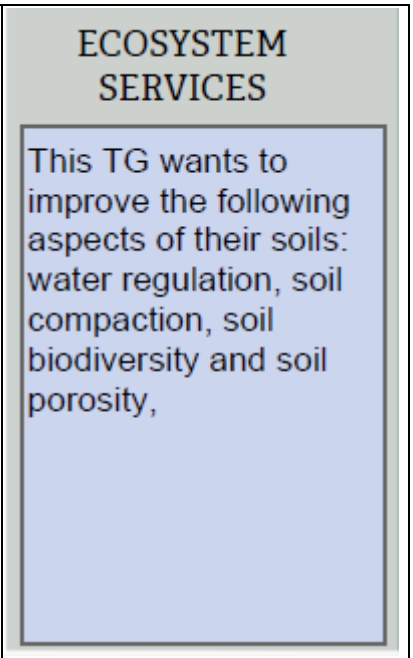
You can add non-soil related practices if they help explain the TG.

Guiding questions	Summary of soil management related farming practices in your TG.	**Example of summarized answer**
Tools	conversations with farmers	

		
Answer(s):	Crop and dairy production, lot of (permanent) grassland with integration of biogas plant initial tests with alternative tilling (side specific / reduced / none) plans to apply compost and or biochar in the future goal is improved nutrient management through more efficient use of manure, For concrete examples of soil management practices please see the filled in questionnaires of our farms who are quite different in their soil management at the moment (conventional vs organic)	

Ecosystem services

Guiding questions	What are the ecosystem services that the TG is currently providing and would be interested in further exploring/improving/marketing/…? Why these ecosystem services? Is there a difference between which ecosystem services stakeholders want to focus on? If so, why is that? Do some stakeholders not want to work with ecosystem services? If so, why?	Example of summarized answer
Tools	WP1 translates current soil practices into set of ecosystem services. A selection could be made by TG leads, farmers and other stakeholders in meetings or focus groups.	

		
Answer(s):	The TG wants to improve soil health / fertility, biodiversity through more efficient utilisation of farm manure, humus formation, biochar production, CO2 storage and land use (here, for example, there is also potential for more regional protein production) Current practices (in addition to those indicated above) and landscape features that support the provision of ecosystem services are hedges, flower margins / strips (agroforestry) and set asides.	

Current resources

These might be human resources (e.g. experience, expertise, inspiring people), physical resources (land under independent control, infrastructure to hold meetings), financial resources (additional subsidy opportunities, farms with some financial reserves) or other.

Guiding questions	What are some essential ingredients in your current TG that could lead to success? Why?	Example of summarized answer
Tools	TG core meetings and stakeholder consultation	

		
Answer(s):	TG members are all very well-connected (head of regional farmer associations), open-minded and creative networkers in the region with old connections between the TG members, stakeholders and other projects and networks for innovative farming practices (e.g. European dairy farmers) Farmers owning their own land, biogas plants, buildings and technical equipment / younger generations are already in charge of the farm management. Common values and goals to do something good for the region / agriculture	

Existing partnerships

Feel free to add any other relevant information, such as existing collaboration between partners outside of the TG.

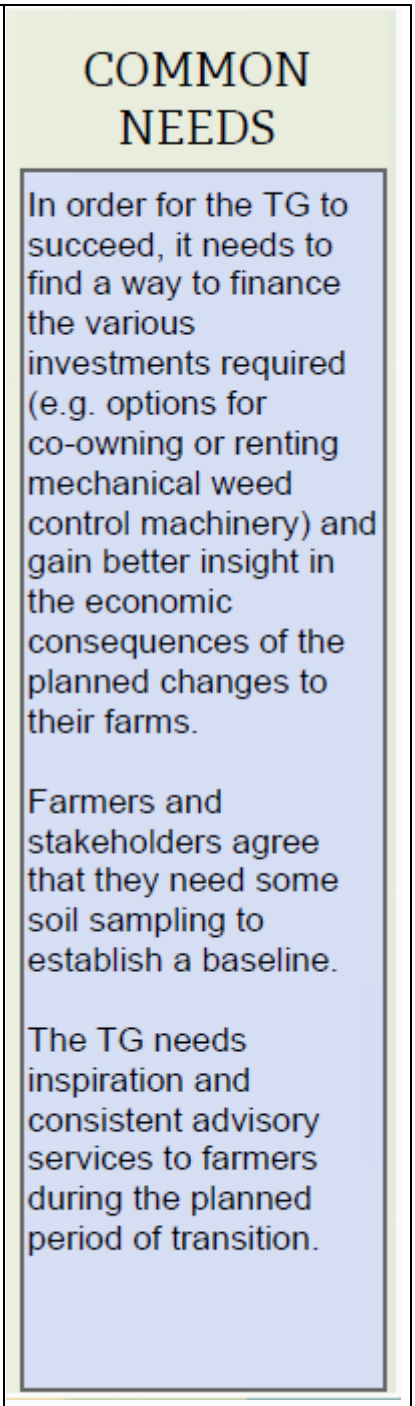
Guiding questions	Who would you consider your main partners in the TG now, and what is their main contribution? How clear is the collaboration at this time? Does every partner know how and when to deliver on their commitments?	Example of summarized answer
Tools	TG leads identify the main partners driving the TG and what the focus of the collaboration is (with TG leads and/or between themselves)	

		
Answer(s):	Many existing partnerships due to the different roles and long biography of some of the stakeholders / families (farmers, stakeholders, traders, advisors, biogas plant owners, community / municipality, other networks and projects focussing on more sustainable farming…). The main partners of the TG are agricultural service provides and networking organisations such as the Landring GmbH and Boben Op, participating farmers, biogas plants and participating research organisation such as the Flensburg University of Applied Sciences and the Thünen Institute	

Common needs

The common needs are identified as part of the current situation. We propose doing this aspect in two steps: 1) Identify what each separate stakeholder needs or expect from the SoilValues project and the TG at this time, 2) Try to find common needs that multiple stakeholders can work together on which helps the TG progress in the immediate future.

Guiding questions	What are some essentials the TG needs right now to progress? Are these things stakeholders agree on? If not, where do the needs of your stakeholders differ?	Example of summarized answer
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	

		
Answer(s):	Need to convince more farmers in the region to participate and change their current way of farming / living (communication / dissemination) Need for financial support and investment to kick-off the practical implementation of the Landwirtschaft Plus concept. Proposal submitted to the latest EIP-Agri call in Schleswig-Holstein. Need infrastructure to run the concept (biogas plants) Need to collect data on soil and economic outcomes of any changes planned / done (data-based story telling)	

	Digitalisation of farms

Planned changes and desired outcomes

Planned soil practices

Guiding questions	What are the soil practices the TG has planned in going towards a SHBM? If no changes in soil practices are planned (e.g. when the aim is to valorise existing ecosystem services provided) you could use this section to explain why.	Example of summarized answer PLANNED SOIL PRACTICES Include promising varieties of potato in new system with minimal tillage, direct drilling after mulching cover crops (e.g. flax with deep root structure), solid manure fertilisation and mechanical weed control.
Tools	Stakeholder interviews, meetings and focus groups	
Answer(s):	Transformation towards more sustainable methods in agriculture, regional cooperative circular economy for agricultural production of bioenergy, soil health, environmental resources and climate protection: The general terms mentioned here hide a variety of starting points for more sustainable agricultural practice, such as improved nutrient management through more efficient use of manure, including composting, to foster humus creation and thus reduction of chemical / external fertilizer use.	

Common goals

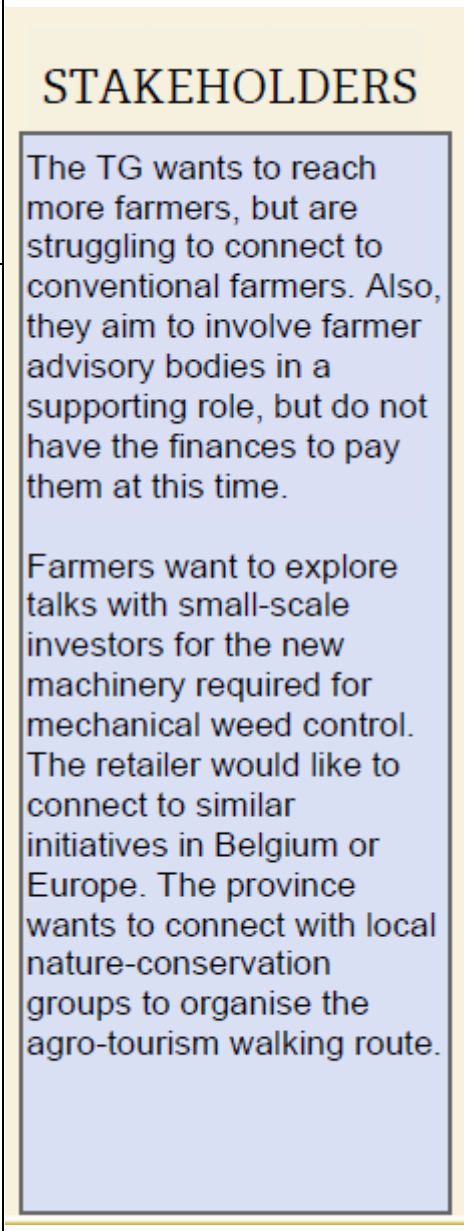
The common goals are identified as part of the planned changes. Like with the common needs, we propose doing this aspect in two steps: 1) Identify what the goals are for each stakeholder (or a selection of stakeholders) within the SoilValues project and the TG and 2) Combine these goals in some sort of 'mission statement' for your TG. If possible you could also include goals from CoP members.

Guiding questions	What are the main goals your stakeholders (or each type of stakeholder) have within the TG? Can stakeholders formulate a 'mission statement' together, or do some of these goals contradict each other?	**Example of summarized answer** COMMON GOALS The core TG has reached out to some members of the CoP and has decided to work towards these common goals: Produce and distribute food in a profitable and sustainable way while also enhancing the regional identity of farmers and become more climate-adapted to droughts and floods.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	

Stakeholders

<table>
<tr><td>Guiding questions</td><td>What are the main categories and roles of stakeholders you are looking to involve in order to get the TG and CoP moving towards those desired outcomes and long-term goals?

What are some concerns or obstacles that would prevent you from involving these stakeholders?</td><td rowspan="2">Example of summarized answer

  </td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups (including CoP?)</td></tr>
<tr><td>Answer(s):</td><td colspan="2">The participants of the TG want to increase the number of farmers involved in the initiative as well as to expand the number of biogas plants.

Farmers are looking for opportunities to benefit from income diversification in circular economies.

The TG might compete with larger scale regenerative bioenergy initiatives that might impact on willingness and availability of further biogas plants to join (or cooperate with) the TG.

Involvement of value chain actors is intended in the longer term, but further elaboration of business model opportunities is required. .</td></tr>
</table>

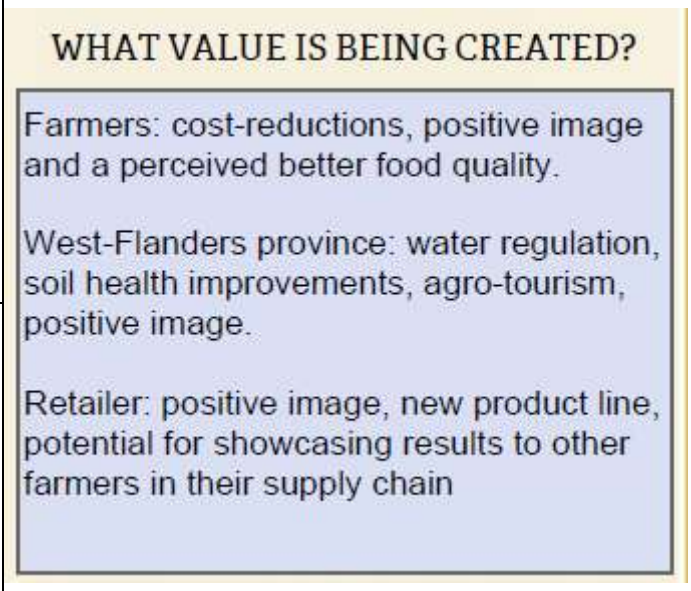
What value is being created?

The creation and distribution of value is a central aspect of the SoilValues project. From a research perspective, WP2 is interested in what various stakeholders find valuable and how this reflects on their willingness to commit resources and their values as organisations or human beings. However, stakeholders interacting with your TG are interested in more practical questions. This gives broadly two options in how to answer this question for a TG: 1) Directly ask stakeholders during a workshop or interviews and 2) identify and summarize stakeholder perceptions of value based on their stated preferences in the common needs, common goals and other interactions.

In this first implementation plan this will probably be a more general description (see example). The more in-depth research we want to do on values within WP2, will be discussed at the next project meeting in Wageningen.

<table>
<tr><td rowspan="2">Guiding questions</td><td>What do the main stakeholders/stakeholder types find valuable in the planned changes?

What kind of contributions would stakeholders make in exchange for changes they find valuable?</td><td rowspan="2">Example of summarized answer

 
</td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups (including CoP?)- Economic data and bio-economic model WP1?</td></tr>
<tr><td>Answer(s):</td><td colspan="2">social: strong cooperation / networking between TG coordinator (no farmer), farms, biogas plants and other stakeholders in the region--> single farmers do not need to coordinate the network

technical: joint nutrient management and composting--> bigger scales reduce the input / effort for each participating farmer

economic: more sustainability of the farms through regional value creation and humus creation--> cost saving (better nutrient management reduces the need of external inputs)</td></tr>
</table>

How is value shared?

Guiding questions	How do you intend on linking incentives with the planned changes? What do your stakeholders think about the division of created value between them?	**Example of summarized answer** HOW IS VALUE SHARED? Farmers want to negotiate fair contract conditions with the retailer, creating value around the new brand of 'Polderpotato' and resulting in sufficient price premiums being paid. The retailer wants to use this brand in regional marketing. The province will provide administrative support for the enhancement of regional identity. ILVO will provide knowledge support in exchange for data collection.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)- Linking up with WP4 regarding incentives and valuation?	
Answer(s):	Collectively (TG network and stakeholders / region) concerning the innovative social and technical values (see above) cooperative approach to share economic values and knowledge; profit is reinvested and shared among TG-group raising awareness for soil health and contribution to ecosystem services by the farmers among the society fostering networking and knowledge sharing of social values composting: provision and distribution among the TG group	

Appendix D: The Netherlands Testing Ground Implementation Plan

If you have multiple distinct 'cases' or 'operations' in your TG, we recommend creating separate implementation plans and Business Model Canvasses (BMC's). Other suggestions or solutions are welcome.

Country	Netherlands
Testing Ground lead(s):	Jan Hassink
Author(s) implementation plan:	Jan Hassink

Background Information

This implementation plan follows the same structure as the SoilValues Business Model Canvas, and allows for further elaboration on the summarized information you put in the SVBMC. It consists of two main sections: 1) Current situation and 2) Planned changes and desired outcomes. Each have their own subcategories for which we have provided guiding questions, possible tools to obtain answers and an example answer from the fictional PolderPotato TG. **Please only add the tools you have used or intend to use for your TG in the finished implementation plan.**

The implementation plan and the SVBMC will need to be periodically updated (e.g. before partner meetings). This first version will serve as input for deliverable 2.2 (deadline 30/04/2024). Each subsequent update will reflect the available information on the situation at a specific time in the project, as well as an opportunity to adjust the planned changes and desired outcomes based on the dynamics and progress in your TG.

You will see that in the tools different methods are described. We want to be clear that we do not expect the TGs to do all these things in February/March. For this first version of the implementation plan it will probably be the easiest to formulate a more general answer to the questions by discussing this in your TG stakeholder group. If you are already planning interviews, you can use those to gather some more information. The implementation plan will be a dynamic document during the project, so it is logical that over the years everything will become clearer, interviews or focus groups will be planned and all the work will contribute to new and more concrete versions of the implementation plan.

Current state of affairs

TG and soil characteristics

Guiding questions	Who is managing the soil involved in the TG? What are the most relevant soil-related characteristics of your TG? E.g. surface area of farms, current management type, soil quality indicators the farmers are interested in, state of degradation of the soils, …	**Example of summarized answer** Two farms in the province of Gelderland. One more on sandy soil and one on more clay soil. Both are

	What other elements define your TG? What are the main drivers from you and your stakeholders in trying to go towards a SHBM?	transforming a conventional diary farm with a English ryegrass into a regenerative farm. Their drive is to farm in collaboration with nature and the community. Elements of both farms are a market garden, agroforestry, grains, limited number of animals. Both have established a community of citizens involved as investors, volunteers and customers. Both farms want to increase SOM, develop a more fungi oriented soil food web.
Tools	Soil data talks and collaboration with WP1, TG leads meetings, conversations with farmers, stakeholder interviews and meetings on community building	
Answer(s):		

Current soil practices

You can add non-soil related practices if they help explain the TG.

Guiding questions	Summary of soil management related farming practices in your TG.	Reduced soil tillage, Agroforestry, use of stable animal manure, green manure, crops that are not harmful for the soil (no sugarbeet and potatoes'). No mineral fertilizer.
Tools	conversations with farmers	
Answer(s):		

Ecosystem services

Guiding questions	What are the ecosystem services that the TG is currently providing and would be interested in further exploring/improving/marketing/…? Why these ecosystem services? Is there a difference between which ecosystem services stakeholders want to focus on? If so, why is that? Do some stakeholders not want to work with ecosystem services? If so, why?	-Cultivated plants for food, feed, bioenergy, etc. -Filtration and storage of waste and toxic substances -Erosion control -Flood control -Provision of water to plants

Tools	WP1 translates current soil practices into set of ecosystem services. A selection could be made by TG leads, farmers and other stakeholders in meetings or focus groups.	-Pollination -Maintaining nursery populations and habitats -Pest and disease control -Water quality regulation -Global climate regulation -Regulation of local/regional temperature and humidity -Possibility for active (e.g., sport) and/or passive (e.g., meditation) activities in nature -Cultural/heritage value and/or beauty of nature -Water provision to groundwater and surface water -Nutrient cycling -Carbon sequestration -Biodiversity
Answer(s):		

Current resources

These might be human resources (e.g. experience, expertise, inspiring people), physical resources (land under independent control, infrastructure to hold meetings), financial resources (additional subsidy opportunities, farms with some financial reserves) or other.

Guiding questions	What are some essential ingredients in your current TG that could lead to success? Why?	Committed farmers, good in communication, appealing stories, strong communities, strong support from citizens and founding organisations
Tools	TG core meetings and stakeholder consultation	
Answer(s):		

Existing partnerships

Feel free to add any other relevant information, such as existing collaboration between partners outside of the TG.

Guiding questions	Who would you consider your main partners in the TG now, and what is their main contribution? How clear is the collaboration currently? Does every partner know how and when to deliver on their commitments?	The 2 TG farms and the entrepreneurs and volunteers working on the farms: The farmers are most aware of the project. Some volunteers assist in collecting data on the farms. Lenteland, Land van Ons and Herenboeren Netherlands are organisations that initiate community farms and are interested in developing a good monitoring system. Other community farms: they exchange information and learn from each other. National organisations supporting sustainable community-oriented farming like Federation of AE farmers, Voedsel Anders. Municipalities. They are not yet linked to the project.
Tools	TG leads identify the main partners driving the TG and what the focus of the collaboration is (with TG leads and/or between themselves)	
Answer(s):		

Common needs

The common needs are identified as part of the current situation. We propose doing this aspect in two steps: 1) Identify what each separate stakeholder needs or expect from the SoilValues project and the TG at this time, 2) Try to find common needs that multiple stakeholders can work together on which helps the TG progress in the immediate future.

Guiding questions	What are some essentials the TG needs right now to progress? Are these things stakeholders agree on? If not, where do the needs of your stakeholders differ?	Both TGs are in transformation from conventional to a regenerative community-oriented system. The TG need to survive the transition period. They invest a lot of time and money in new activities and e.g. in trees and shrubs. They need sufficient cash flow. -In addition, they need more insight in the costs and rewards of different activities on the farm. - They need data to monitor the development of soil
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	

		quality and soil life, and to test some of their hypotheses, e.g. that the soil quality is increasing, that they are building SOM and that the food web becomes more fungi dominated. - They need to increase community involvement and their investments in the farm. All stakeholders agree on these needs.
Answer(s):		

Planned changes and desired outcomes

Planned soil practices

Guiding questions	What are the soil practices the TG has planned in going towards a SHBM? If no changes in soil practices are planned (e.g. when the aim is to valorise existing ecosystem services provided) you could use this section to explain why.	Both TG farms limit soil tillage and soil disturbance. They keep the soil covered. They introduce agroforestry, trees, shrubs, and natural elements in their farming system. They only use stable manure. No mineral fertilizers, no slurry, and no pesticides.
Tools	Stakeholder interviews	
Answer(s):		

Common goals

The common goals are identified as part of the planned changes. Like with the common needs, we propose doing this aspect in two steps: 1) Identify what the goals are for each stakeholder (or a selection of stakeholders) within the SoilValues project and the TG and 2) Combine these goals in some sort of 'mission statement' for your TG. If possible you could also include goals from CoP members.

Guiding questions	What are the main goals your stakeholders (or each type of stakeholder) have within the TG? Can stakeholders formulate a 'mission statement' together, or do some of these goals contradict each other?	The main interest of the TG farmers is to get support (also by data and monitoring) to reflect on the choices they make in building their regenerative system. It is also important for them to get support from the municipalities to add new functions (and buildings, e.g. housing for
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	

		employees, food hub, etc.) to their farm. And they are interested to attract investors which support their vision. Lenteland is very interested in developing a solid system to monitor the development in ecological, social and economic quality: development in soil quality, landscape, biodiversity etc . They are also interested to establish new community oriented regenerative farms.
Answer(s):		

Stakeholders

Guiding questions	What are the main categories and roles of stakeholders you are looking to involve in order to get the TG and CoP moving towards those desired outcomes and long-term goals? What are some concerns or obstacles that would prevent you from involving these stakeholders?	The TG wants to connect to more community oriented farmers and make community oriented farming more visible. The TG wants to increase the connections and exchange between organisations supporting community oriented regenerative farming. These organisation are Lenteland, Herenboeren Nederland, Cooperatie Burgerboerderijen, CSA netwerk, Federatie AE boeren etc. The TG wants to involve municipalities in order to get their support for the further development of community farms. Finally the TG wants to reach out to other farmers and stakeholders in their region to increase collaboration at regional level in sharing machinery, We are now reaching out to all these actors, both at regional level (e.g. municipalities) and at national level.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	

Answer(s):	

What value is being created?

The creation and distribution of value is a central aspect of the SoilValues project. From a research perspective, WP2 is interested in what various stakeholders find valuable and how this reflects on their willingness to commit resources and their values as organisations or human beings. However, stakeholders interacting with your TG are interested in more practical questions. This gives broadly two options in how to answer this question for a TG: 1) Directly ask stakeholders during a workshop or interviews and 2) identify and summarize stakeholder perceptions of value based on their stated preferences in the common needs, common goals and other interactions.

In this first implementation plan this will probably be a more general description (see example). The more in-depth research we want to do on values within WP2, will be discussed at the next project meeting in Wageningen.

Guiding questions	What do the main stakeholders/stakeholder types find valuable in the planned changes? What kind of contributions would stakeholders make in exchange for changes they find valuable?	The whole system is transformed to farm in harmony with nature and with the community. Important values are increase in biodiversity, in landscape quality, in soil quality, positive contribution to climate change by using less fossil fuel. In addition the TG farms deliver social values: they create value for community: healthy and fresh food, volunteers contribute to the farm, they invest, there is education etc. The TG farms are also active in regional and national networks showing other farmers, consumers, policy makers etc. that this is a sustainable way forward for the Dutch agricultural and food system. Stakeholders want to invest in monitoring, support in the realization of plans etc. This is still to be further explored.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)- Economic data and bio-economic model WP1?	
Answer(s):		

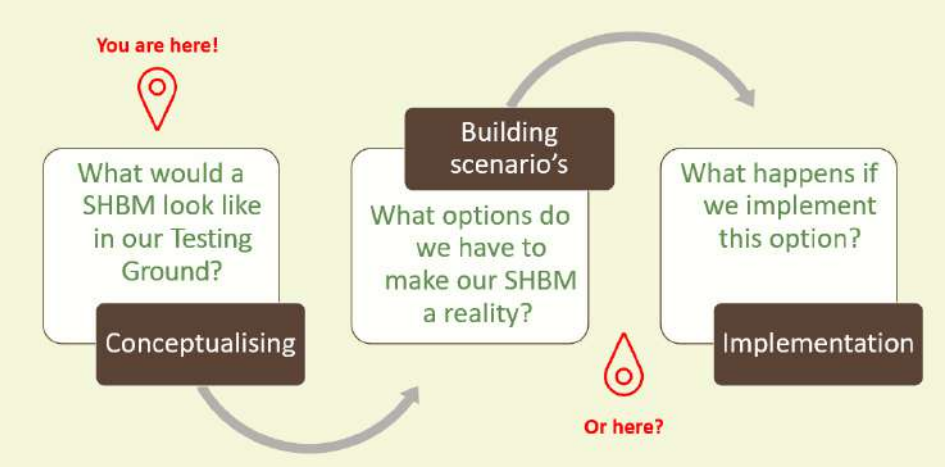
How is value shared?

Guiding questions	How do you intend on linking incentives with the planned changes? What do your stakeholders think about the division of created value between them?	This is in development. We try to link with municipalities to get their support for plans made by the TG farms. Organisations like Lenteland and Cooperatie Burgerboerderijen want to invest in monitoring and invest financially. WUR invests in support with monitoring and economic analysis of different activities and different scenario's. WUR also interviews volunteers/citizens connected to the TG farms to get a deeper understanding of their motivation and benefits. WUR also invests in bringing farmers and stakeholders together, organizing reflection sessions (in preparation) and linking TG farms to policy objectives.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)- Linking up with WP4 regarding incentives and valuation?	
Answer(s):		

Next steps

Guiding questions	What specific steps will you be taking in the next period (e.g. between now and the next partner meeting) within your TG to address your common needs and work towards the common goals and desired outcomes?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	
Answer(s):	We will have interviews with the TG farmers to get a good monitoring plan for soil quality. We will discuss how we can exchange information and lessons between TG farms and similar farms. We will further explore monitoring options/approaches with Lenteland, Herenboeren Nederland and Cooperatie Burgerboerderijen

Desired outcomes (within SoilValues)

Guiding questions	In broad terms, what would your TG like to achieve by end of the SoilValues project? What position would you like your TG to be at that time? 
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	
Answer(s):	The TG farms are in transition and now planting trees and shrubs and introducing new crops and species rich grassland. We monitor the transition of the TG farms and the changes in soil quality, in community building and in economic performance.

Goals and strategy (long term)

Goals and strategies in the long term likely depend on achieving certain outcomes within the SoilValues project. In that case, you could formulate a conditional statement like in the example below.

Guiding questions	What would your TG like to achieve in the long-run, going beyond the SoilValues project?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	

Answer(s):	We aim to build stronger regional and national networks of community oriented regenerative farms that are supported by citizens. We hope to reach impact beyond the farm level, and influencing more conventional farmers. We aim to build a good collaboration between organisations active on this topic, including nature organisations. And we aim to develop a sustainable system to monitor the development and values of community oriented regenerative farms.

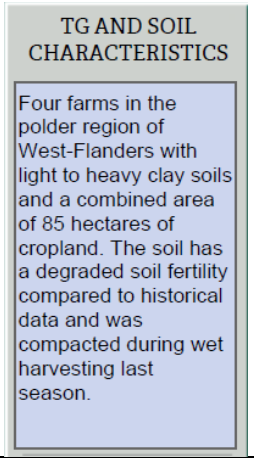
Appendix E: Polish Testing Ground Implementation Plan

Country	Poland
Testing Ground lead(s):	Piotr Gradziuk, Katarzyna Zawalińska
Author(s) implementation plan:	Piotr Gradziuk, Katarzyna Zawalińska, Vitaliy Krupin, Adrianna Wojciechowska

Current state of affairs

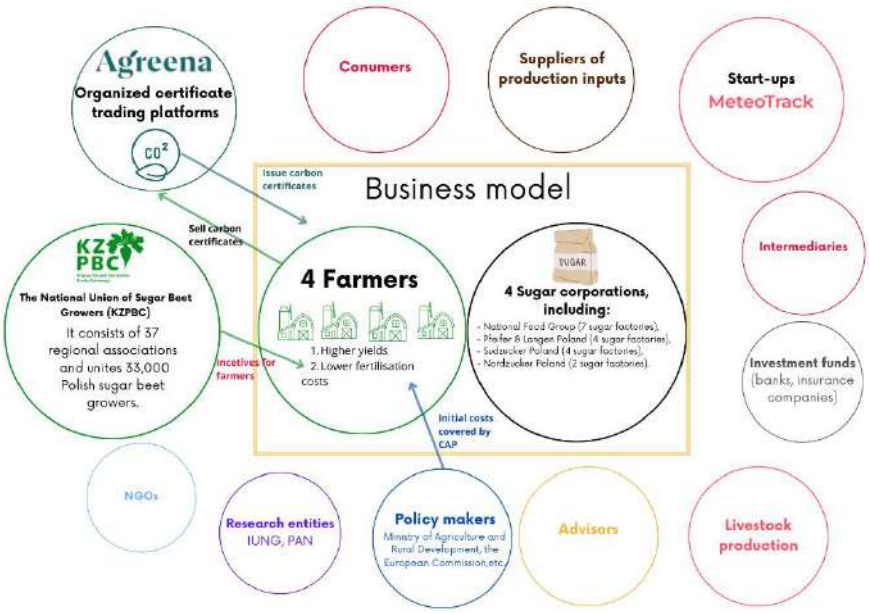
TG and soil characteristics

<table>
<tr><td>Guiding questions</td><td>Who is managing the soil involved in the TG? What are the most relevant soil-related characteristics of your TG? E.g. surface area of farms, current management type, soil quality indicators the farmers are interested in, state of degradation of the soils, …

What other elements define your TG? What are the main drivers from you and your stakeholders in trying to go towards a SHBM?</td><td rowspan="2">Example of summarized answer
  </td></tr>
<tr><td>Tools</td><td>Soil data talks and collaboration with WP1, TG leads meetings, conversations with farmers, stakeholder interviews and meetings</td></tr>
<tr><td>Answer(s):</td><td colspan="2">Answer: Three farms are in Southeastern Poland (Lubelskie region), one in Central Poland (Łodzkie region).

The farms from Lubelskie region are family farms with long traditions, the average area of these farms is about 150 hectares of arable land, from 60 hectares to 250 hectares. The farm from the Łódzkie region is the Agricultural Experimental Station of the Institute of Soil Science and Plant Cultivation State Research Institute. Soils on all farms are good or very good quality, cultivated according to agro-technical principles.

Elements of TG and drives:
Our TG consists of a Core Group (4 farmers, NordZucker, National Union of Sugar Beet Growers, and a Certification Company (Agreena). Besides, in our TG other stakeholders belong to CoP (IUNG science institute, advisors, NGOs, science institutes, etc.) – see the drawing below. The full list of 20 stakeholders from Core Group and CoP can be provided.</td></tr>
</table>



Our SHBM received a name from our stakeholders ***SOILPROFIT*** as the main purpose of the model is taking care of soil in the way that is profitable to all stakeholders.

In particular the main drivers of key stakeholders are as follows:

Actor		What is the actor giving?	What is the actor receiving?
KZ PBC	Farms	Changing conventional practices to regenerative ones, sharing soil samples, taking part in the CarbonAgreena programme, business model co-creation	Carbon certificate, purchase guarantee, CAP subsidies (eco-schemes), data on the soil health, indications on better soil management, knowledge aquired during the project
Nordzucker	Sugar corporations	Buying certificates from farmers, sugarbeet purchase from farmers, advisory on input of production (fertilisers, pesticides, training)	Benefits from the certificate purchase (CO2 emission reduction, more eco-friendly production, Image building of clean production)
Agreena	Carbon certificate company (e.g. Agreena)	Possibility for the farmers to use AgreenaCarbon programme for free, carbon certificates, data from soil examination, help of comapny's consultants	Insights from project's results, contacts to potential clients, input for database, business model co-creation
INSTYTUT AGROFIZYKI IUNG	Research entities	Sharing knowledge, experts opinions, data on soil	Insights on the project's results

Tools: visits to farms in the Lubelskie region (a total of 8 visits), during which interviews were conducted. In the case of the farm from the Łódzkie region, one face-to-face interview at the IRWiR PAN and 4 telephone interviews and the workshop of the CoP and core group (20 stakeholders) that took place in December 2023.

Current soil practices

You can add non-soil related practices if they help explain the TG.

Guiding questions	Summary of soil management related farming practices in your TG.	**Example of summarized answer** CURRENT SOIL PRACTICES Crop rotation with potato, onion, carrot, sugar beet and wheat as main cash crops. Conventional tillage and synthetic fertilizer usage. Limited use of cover crops.
Tools	conversations with farmers	
Answer(s):	The main soil management farming practices are: – soil testing, – use of crop rotation according to agro-technical principles, – all farms used organic fertilization through the use of green manures (plowing straw or intercrops), – two farms also used either manure or slurry, – on three farms, no-till (plowless) cultivation was carried out. On a fourth, plowing due to large amounts of manure, which, according to the farmer, must be tilled, – all farms benefit from eco-schemes support (fertilizer plans, carbon farming). **Tools:** visits to farms in the Lubelskie region (a total of 8 visits), during which interviews were conducted. In the case of the farm from the Łódzkie region, one face-to-face interview at the IRWiR PAN and 4 telephone interviews.	

Ecosystem services

Guiding questions	What are the ecosystem services that the TG is currently providing and would be interested in further exploring/improving/marketing/…? Why these ecosystem services? Is there a difference between which ecosystem services stakeholders want to focus on? If so, why is that? Do some stakeholders not want to work with ecosystem services? If so, why?	**Example of summarized answer** ECOSYSTEM SERVICES This TG wants to improve the following aspects of their soils: water regulation, soil compaction, soil biodiversity and soil porosity,
Tools	WP1 translates current soil practices into set of ecosystem services. A selection could be made by TG leads, farmers and other stakeholders in meetings or focus groups.	
Answer(s):	**The main ecosystem services provide by our TG are:**	

	– **Pest and disease control –** farmers check the threshold of damage of agrophages and based on this information, they make decisions on the use of pesticides (reduced amount of pesticides = good effect on the ecosystem) The farmers are aware that if you do not protect the crop then production is smaller – **Carbon sequestration –** in 3 farms they use no-till, which retains more carbon in the soil (farmers are using carbon farming eco-scheme) – **Habitat** – to a small extent (mid-field afforestation). Balks, mid-field afforestation or bushes are eliminated, as there were ARMA inspections to exclude such areas from the subsided areas (farmers wanted the largest possible subsidies). – **Biodiversity** – diversification of field crops, (about 7 types), taking into account the cultivation of winter species and structural crops, also in the form of intercrops. – **Pollination** – 4 farms grow rapeseed and are very careful about the right way to use pesticides so as not to harm pollinators – **Erosion control** – rather yes, if the fields are sloping then farmers cultivate the land across to reduce water erosion. By using intercropping they protect the soil from wind erosion. – **Nutrient cycling** – all farms use fertilizer plans and soil testing in order to apply as little mineral fertilizer as possible. Farmers try to use the amount of fertilizer that the soil can absorb. They are aware that an excess of minerals will be leached into watercourses and eutrophication will occur. Nitrogen can also be released into the atmosphere, resulting in an increase in GHG emissions. **Why these ecosystem services?** – **Carbon sequestration –** No-till farming means lower fuel consumption, more organic matter in the soil. Farmers engage in these practices due to the payments they receive. – **Pest and disease control –** generated savings as farmers diminish the amount of purchased chemicals. – **Habitat** – to a small extent due to the subsidies problem mentioned above – **Biodiversity –** There are two factors in this case. First are natural factors (crop rotation causes less aggravation of diseases and pests) and economic factors (diversification of production). – **Pollination –** farmers are aware that more pollinators turnover, means higher yields. – **Erosion control-** farmers want to prevent: leaching of humus and mineral components, leaching of the arable layer of the soil (better yields, better soil quality) and ditches in the soil (plants running off when they are not properly rooted). – **Nutrient cycling- –** generated savings as farmers diminish the amount of purchased fertilizers. **Do some stakeholders not want to work with ecosystem services?** There are no stakeholders that are against functioning of the ecosystem services. **Tools:** TG team translated the practices into ecosystem services based on the delivered set.

Current resources

These might be human resources (e.g. experience, expertise, inspiring people), physical resources (land under independent control, infrastructure to hold meetings), financial resources (additional subsidy opportunities, farms with some financial reserves) or other.

<table>
<tr><td>Guiding questions</td><td>What are some essential ingredients in your current TG that could lead to success? Why?</td><td rowspan="2">Example of summarized answer
 
</td></tr>
<tr><td>Tools</td><td>TG core meetings and stakeholder consultation</td></tr>
<tr><td>Answer(s):</td><td colspan="2">What are current resources?

Human resources: experienced scientists, farmers and partners from the agribusiness sphere (public and commercial consulting, buyers of agricultural raw materials, suppliers of inputs, etc.),

Physical resources: 3 farmers owning their own land, one farm owned by the IUNG,

Financial resources: additional income from carbon certificates, eco-schemes

What are some essential ingredients in your current TG that could lead to success? Why?

First of all, the exchange of experience between scientists and farmers and partners from the agribusiness sphere (public and commercial consulting, buyers of agricultural raw materials, suppliers of inputs, etc.).

During the workshop with the CoP we carried the SWOT analysis. There were, various success factors mentioned among the Strenghts of our TG and Opportunities. In particular

Strengths:

– Benefits of caring for soil quality: sugar beet farmers who follow soil health practices will secure long-term productivity gains (lower input costs and increased yields from healthy soil) and improved product quality.
– Additional revenue for the farm resulting from carbon certification.
– Soil for future generations.
– Educational function- raising public awareness.
– Recommendations for developing future certification regulations.
– Maintaining sugar beet production.
– Sustainable agricultural production and the final product (beet).
– Dissemination of a circular economy model.</td></tr>
</table>

	Opportunities: – Payments under eco-schemes from the CAP. – Development of advisory services providing knowledge on soil health practices. – Favourable offers from certification agencies offering carbon certificates to farmers, feedback on regenerative practices, broker pre-sales of farmers' certificates. – Increased consumer awareness of production processes. – Sales outside the value chain (from the point of view of the agricultural producer). – Good conditions for sugar beet production. – Started work on regulations for trading carbon certificates. – Sustainable production along the value chain- increased awareness of individual links in the chain e.g. Awareness of food producers (Nestle). **Tools:** Workshop of the CoP and core group (20 stakeholders) that took place in December 2023. The next one will be held in May (Agricultural Experimental Station of the Institute of Soil Science and Plant Cultivation State Research Institute).

Existing partnerships

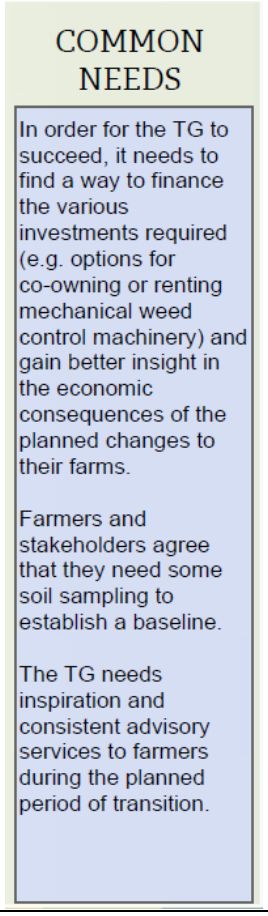
Feel free to add any other relevant information, such as existing collaboration between partners outside of the TG.

Guiding questions	Who would you consider your main partners in the TG now, and what is their main contribution? How clear is the collaboration at this time? Does every partner know how and when to deliver on their commitments?	**Example of summarized answer** EXISTING PARTNERSHIPS The existing partnerships consist of the farmers, the retailer, Province West-Flanders and a research institute (ILVO).
Tools	TG leads identify the main partners driving the TG and what the focus of the collaboration is (with TG leads and/or between themselves)	
Answer(s):	They are mainly farmers, representatives of the National Union of Sugar Beet Growers, the sugar sector, other science institute IUNG. So far, everyone is aware of their commitments and they are delivered. The full picture of the current relationships is covered by Stakeholders Network Analysis provided in the project – see table E1. **Tools**: TG team made an Identification of main partners driving the TG. Situation is dynamic, TG team is managing the networking of key partners.	

Common needs

The common needs are identified as part of the current situation. We propose doing this aspect in two steps: 1) Identify what each separate stakeholder needs or expect from the SoilValues project and the

TG at this time, 2) Try to find common needs that multiple stakeholders can work together on which helps the TG progress in the immediate future.

<table>
<tr><td>Guiding questions</td><td>What are some essentials the TG needs right now to progress? Are these things stakeholders agree on? If not, where do the needs of your stakeholders differ?</td><td rowspan="2">Example of summarized answer
 
</td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups (including CoP?)</td></tr>
<tr><td>Answer(s):</td><td colspan="2">Common needs by partners:
For the TG to succeed there are few a few issues to be addressed:

TG leads, farmers: the funds secured in the project seem insufficient to carry out the ideal number and coverage of soil testing (the cost per sample is about €100), performing samples on farms would be an incentive to participate in the project. Not enough funds for trips to farms, as this is the best way to get information from farms.

Sugar concerns (Nordzucker), TGE (Towarowa Giełda Energii) Farmers , Carbon certification companies: they need both EU level and country level legislation on carbon credits. Now it is missing so all kind of unregulated actions take place.

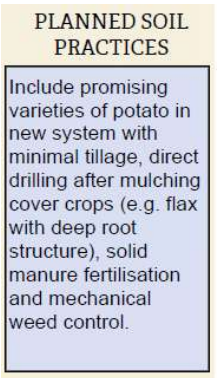
Sugar concerns (Nordzucker) and KZPBC: need to implement technologies and knowledge allowing for higher carbon sequestration so both NordZucker and KZPBC will be able to show their contribution in lowering carbon footprint in Poland

Certification companies and farmers: need monetisation of carbon certificates – they sign the agreements for carbon certificates which, however, are not beneficial for sugar concerns because then they cannot get credit for their involvement in the introduction of soil health technologies.</td></tr>
</table>

	Sugar concerns (Nordzucker), IUNG and IRWIR PAN: the common need for deeper analyses of farmers and their potential of lowering the carbon footprint Tools: Contacts with partners were obtained through the KZPBC (the National Union of Sugar Beet Growers) and contacts with partners with whom cooperation was undertaken on previously implemented Horizon2020 projects (SUREFARM, LIFT).

Planned changes and desired outcomes

Planned soil practices

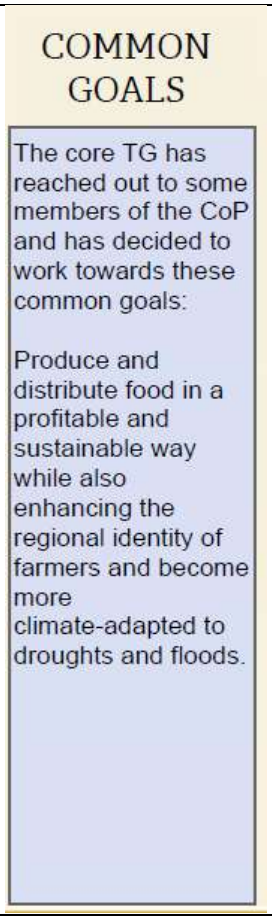
<table>
<tr><td>Guiding questions</td><td>What are the soil practices the TG has planned in going towards a SHBM? If no changes in soil practices are planned (e.g. when the aim is to valorise existing ecosystem services provided) you could use this section to explain why.</td><td rowspan="2">Example of summarized answer
  </td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups</td></tr>
<tr><td>Answer(s):</td><td colspan="2">The soil practices planned in TG are as follows;
– Those practices that contribute to increasing the organic matter (carbon) content of the soil (switching from plowing to no-till)
– Farms that are already using no-till, will increase intercropping, to provide more organic matter in the soil than before.

Tools: Visits to farms, phone conversations, face-to-face conversations with representatives of the KZPBC (this is facilitated by the fact that the headquarters of this organization is in the vicinity of the IRWiR PAN).</td></tr>
</table>

Common goals

The common goals are identified as part of the planned changes. Like with the common needs, we propose doing this aspect in two steps: 1) Identify what the goals are for each stakeholder (or a selection of stakeholders) within the SoilValues project and the TG and 2) Combine these goals in some sort of 'mission statement' for your TG. If possible you could also include goals from CoP members.

Guiding questions	What are the main goals your stakeholders (or each type of stakeholder) have within the TG? Can stakeholders formulate a 'mission statement' together, or do some of these goals contradict each other?	Example of summarized answer

Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	
Answer(s):	**Common goals:** Profitable and sustainable sugar beet production with emphasis on soil and product quality (that is why our stakeholders gave a name to our BSHM "SOILPROFIT"). **Farmers:** improvement of soil quality, additional payments for carbon credits, knowledge gained from meetings held as part of the project. **Sugar Factories:** improvement of raw material quality, retention of existing growers (possibly attracting new ones), purchase of GHG emission reduction certificates from farmers. **NGOs:** building "image", promoting new solutions for farmers through published magazines or websites. **Carbon certification companies-** want to attract as many farmers as possible (acreage where GHG emission reductions can be demonstrated). **Tools:** As mentioned in previous answers. Direct contacts (they are the most effective), phone calls, email exchange.	

Stakeholders

<table>
<tr><td>Guiding questions</td><td>What are the main categories and roles of stakeholders you are looking to involve to get the TG and CoP moving towards those desired outcomes and long-term goals?

What are some concerns or obstacles that would prevent you from involving these stakeholders?</td><td rowspan="2">Example of summarized answer

STAKEHOLDERS

The TG wants to reach more farmers, but are struggling to connect to conventional farmers. Also, they aim to involve farmer advisory bodies in a supporting role, but do not have the finances to pay them at this time.

Farmers want to explore talks with small-scale investors for the new machinery required for mechanical weed control. The retailer would like to connect to similar initiatives in Belgium or Europe. The province wants to connect with local nature-conservation groups to organise the agro-tourism walking route.</td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups (including CoP?)</td></tr>
<tr><td>Answer(s):</td><td colspan="2">First and foremost, farmers- they provide us with information on soil from the samples, share experiences, willing to change practices to improve soil quality.

KZPBC helps us in these contacts and other partners working with sugar beet producers (including, among others, sugar concerns, GHG emission reduction certification bodies.

Sugar factories (4 in Poland)- also contact with farmers, data from Agripartner platform

Obstacles or concerns that sounded out during the research were:
– Lack of conviction in soil health practices- farmers may sometimes not wait for future profits by incurring increased costs now, preferring to continue with existing practices
– Lack of confidence and awareness of regenerative/carbon farming practices
– Financial instability/unpredictability regarding payments from eco-schemes
– Potential for farmer discouragement due to heavy bureaucratic burden
– High competitiveness for the model from the private sector
– Instability of EU and national policies
– Threat of takeover of certificates by high-carbon, other industries
– Lack of rules of cooperation between the industry and the farmer on the development of certification methods (lack of legal regulations in this area)</td></tr>
</table>

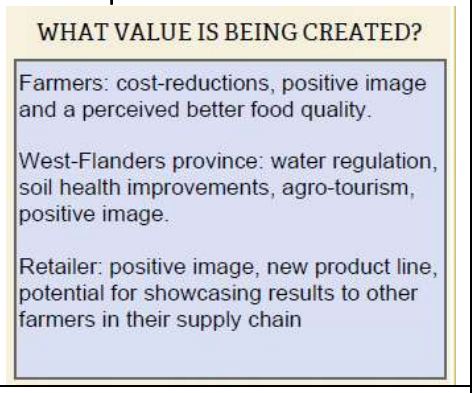
	– Loss of time during the development of regulations (from the point of view of the companies) – Lack of a legal structure that will provide benefits to the farmer- an uncertain investment of time and resources. **Tools:** as mentioned previously.

What value is being created?

The creation and distribution of value is a central aspect of the SoilValues project. From a research perspective, WP2 is interested in what various stakeholders find valuable and how this reflects on their willingness to commit resources and their values as organisations or human beings. However, stakeholders interacting with your TG are interested in more practical questions. This gives broadly two options in how to answer this question for a TG: 1) Directly ask stakeholders during a workshop or interviews and 2) identify and summarize stakeholder perceptions of value based on their stated preferences in the common needs, common goals, and other interactions.

In this first implementation plan this will probably be a more general description (see example). The more in-depth research we want to do on values within WP2, will be discussed at the next project meeting in Wageningen.

<table>
<tr><td>Guiding questions</td><td>What do the main stakeholders/stakeholder types find valuable in the planned changes?

What kind of contributions would stakeholders make in exchange for changes they find valuable?</td><td rowspan="2">Example of summarized answer
 
</td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups (including CoP?)- Economic data and bio-economic model WP1?</td></tr>
<tr><td>Answer(s):</td><td colspan="2">What do the main stakeholders/stakeholder types find valuable in the planned changes?

Farmers- additional income from carbon credits, additional knowledge, information, and probable improvement in soil quality as a result of the measures taken.

Sugar factories- repurchase of carbon certificates from farmers, stable cooperation with farmers, better quality raw material

Certification companies- contacts with farmers (potential partners)

What kind of contributions would stakeholders make in exchange for changes they find valuable?

Farms - change of practices, time, knowledge, and experience, provide access to fields

Sugar factories- financial resources, dedicated time, access to data</td></tr>
</table>

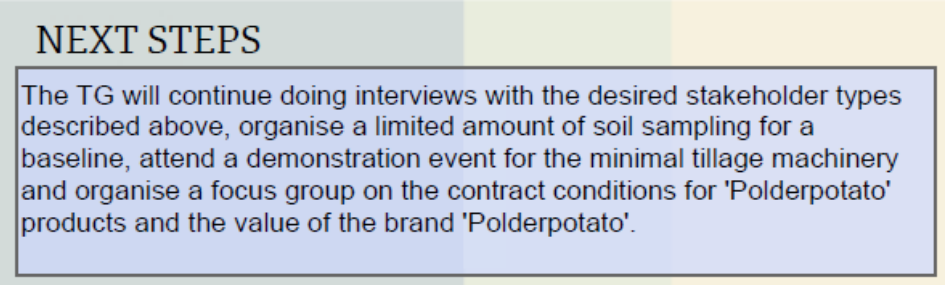
	Certification companies- time, access to data, shared knowledge, the opportunity to explain the idea of carbon farming to farmers **Tools:** As mentioned previously.

How is value shared?

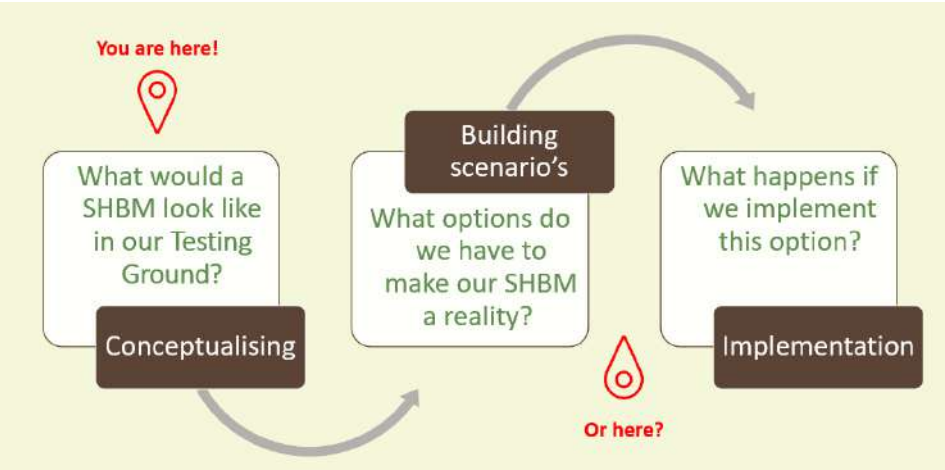
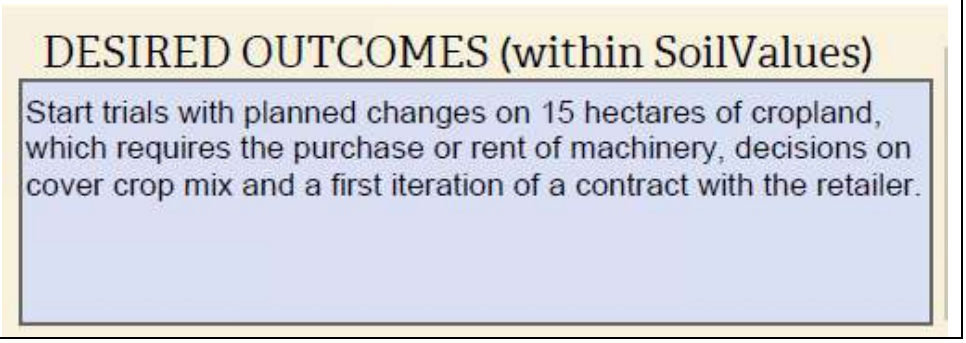
Guiding questions	How do you intend on linking incentives with the planned changes? What do your stakeholders think about the division of created value between them?	**Example of summarized answer** HOW IS VALUE SHARED? Farmers want to negotiate fair contract conditions with the retailer, creating value around the new brand of 'Polderpotato' and resulting in sufficient price premiums being paid. The retailer wants to use this brand in regional marketing. The province will provide administrative support for the enhancement of regional identity. ILVO will provide knowledge support in exchange for data collection.
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)- Linking up with WP4 regarding incentives and valuation?	
Answer(s):	**As for the value sharing all the stakeholders worked on the soil health problem and had their own interests in that so the incentives came from them, not from the project. In other words, it was a bottom-up approach. The stakeholders welcomed the project very much because it helped them to gather and to have a forum for discussion and cooperation. In particular:** - Farmers: obtain carbon certificates from the carbon sequestrated in the soil. - Sugar factories: among others, are interested in acquiring these certificates, and farmers are interested in selling the certificates at the highest possible prices, not necessarily to sugar factories. Both sides can be encouraged to negotiate. - Sugar factories: encourage farmers to sell them certificates, for example, by financing their soil testing and providing knowledge on regenerative agriculture. - Scientists (IRWIR PAN, IUNG): have the interest to demonstrate that the implementation of regenerative (carbon) agriculture technology will improve soil quality (which we will try to demonstrate through the results of soil analysis, which we will pay for as part of the project. Better soil quality will result in higher yields, - NGOs: facilitate negotiations so that they can be conducted under the sponsorship of the KZPBC and the Association of Sugar Producers in Poland, initially also the IRWiR.	

Next steps

Guiding questions	What specific steps will you be taking in the next period (e.g. between now and the next partner meeting) within your TG to address your common needs and work towards the common goals and desired outcomes?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders

Example of summarized answer	
Answer(s):	- In March, by the end of March we will take soil samples at four farms, - In May, we will organize a meeting of all partners at one of the farms, during which we will present innovative soil cultivation technologies, with the possible demonstration of machinery. - We will keep up to date on the work on legislation related to the implementation of the principles of carbon farming (certification and certificate trading). The Towarowa Giełda Energii S.A. in Warsaw is interested in cooperation.

Desired outcomes (within SoilValues)

Guiding questions	In broad terms, what would your TG like to achieve by end of the SoilValues project? What position would you like your TG to be at that time? 
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	

Answer(s):	Based on the graph above, we are in the building scenario's phase. The desired outcomes are: 1) obtaining carbon certificates by four farms in our case study, 2) signing the contracts for the sale of carbon certificates between farmers and sugar factories/corporations.

Goals and strategy (long term)

Goals and strategies in the long term likely depend on achieving certain outcomes within the SoilValues project. In that case, you could formulate a conditional statement like in the example below.

Guiding questions	What would your TG like to achieve in the long-run, going beyond the SoilValues project?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	LONG TERM STRATEGY (beyond SoilValues) If the planned changes are shown to be economically viable and the partnerships are succesful, the farmers would like to implement it on a larger scale. This would require additional sources of compost and/or solid manure and more committments to the existing partnerships.
Answer(s):	In the long term, 1) increase bio sequestration of carbon in the soil and 2) launch a market for trading carbon certificates.

Table E1 Stakeholders Network Analysis with regards to the Polish TG (Person names are anonymized (P1, P2, etc) but known by the authors)

	Initiative							
	Name of TG: *Regenerative agriculture in the sugar beet production value chain* ***Burning question****: How to improve the soil and product quality through regenerative practices in SHBM*							
Stream	Carriers		Factors		Actors		Links	
	Identification	*Why a Carrier?*	*Identification*	*Why a Factor?*	*Identification*	*Why an Actor?*	*Identification*	*Why a Link?*
1	P1, P2 (IRWiR PAN)	These individuals act as intermediaries between farmers in TG and the project	Farmers' interest in SoilValues service	If farmers lose interest, TG will fall apart	Technical consultancy working directly with farmers	These are people who have built a personal relationship with the farmer and have technical knowledge of the region	National Union of Sugar beet Growers (KZBC)	Seek opportunities for knowledge transfer among farmers, sugar beet producers
2	Farm associated with IUNG PIB (Institute of Soil Science and Plant Cultivation- State Research Institute); P3	Farmer(s) implementing renegade farming practices	Understanding the importance of regenerative agriculture	Implementation of the principles of regenerative agriculture will help improve soil quality	P4, P5	They have proven empirical knowledge	Department of Agronomy at SGGW, IUNG PIB, private agrotechnical consultancy	KZPBC Partners
3	P6, P7 (KZPBC)	Work with Farms (Farmers) implementing regenerative farming practices	Identify opportunities for GHG reduction	Reducing GHG emissions in exchange for carbon credits	Agreeny representative	Director of Agreena Branch in Poland	KZPBC, sugar corporations	KZPBC seeks additional income for farmers. Sugar companies are looking to purchase GHG

								reduction certificates
4	P8	Farmer with an experimental station affiliated with SoilValues and IUNG (Institute of Soil Science and Plant Cultivation)	No-till cultivation	In the long run, higher yields and healthier soil	P8 (KZPBC)	Sugar beet farmer recruited to SoilValues	KZPBC (P9)	Mediated farmer recruitment for SoilValues
5	P10	A farmer with an experimental station linked to SoilValues	Maximizing of organic soil matter	Increasing organic matter increases soil quality	P11 (Agreena)	Sugar beet farmer recruited for SoilValues	Agreena (P12)	Mediated farmer recruitment for SoilValues
6	P13	A farmer with an experimental station linked to SoilValues	Carbon sequestration	Caring for the soil that simultaneously results in reduced CO2 emissions	P13 (Agreena)	Sugar beet farmer recruited for SoilValues	Agreena (P14)	Mediated farmer recruitment for SoilValues
7	P15	A farmer with an experimental station linked to SoilValues	Crop rotation	Enhance the soil structure, boosts soi fertility, and prevents erosion	P15 (KZPBC)	Sugar beet farmer recruited for SoilValues	KZPBC (P16)	Mediated farmer recruitment for SoilValues
8	P17, P18	Nordzucker Polska - Sugar Producer	Sugar beet buyer and sugar producer	Demands quality of the product and soil health practices for the sake of the image	Farmers(P19, P20, P21, P22)	Sugar beet farmers recruited for SoilValues	KZPBC (P23) and IRWiR PAN	Networking through CoP and National Union of Sugar beet Growers (KZPBC)

				of the company (PR)				
9	P24 (Agreena)	Agreena- Carbon Certification Company	Issuing carbon certificates and intermediating in sale of the certificates	They are interested in lowering the GHG emissions because then they issue more certificates	Farmers (P25-29)	Sugar beet farmers recruited for SoilValues	Direct contact of the Polish branch of Agreena with the farmers	They have their own sales department
10	CDR Brwinów (P30)	Agricultural Advisory Center in Brwinów	CAP payments (eco-schemes)	Assists in selecting regenerative agriculture practices and acquiring CAP funds (eco-schemes)	Farmers (P25-29))	Sugar beet farmers recruited for SoilValues	IRWiR PAN	Networking through CoP

Appendix F: Portuguese Testing Ground Implementation Plan

Country	Portugal
Testing Ground lead(s):	Diogo Moniz, Margarida Próspero, Dina Lopes
Author(s) implementation plan:	Diogo Moniz, Margarida Próspero

Background Information

This implementation plan follows the same structure as the SoilValues Business Model Canvas, and allows for further elaboration on the summarized information you put in the SVBMC. It consists of two main sections: 1) Current situation and 2) Planned changes and desired outcomes. Each have their own subcategories for which we have provided guiding questions, possible tools to obtain answers and an example answer from the fictional PolderPotato TG. **Please only add the tools you have used or intend to use for your TG in the finished implementation plan.**

The implementation plan and the SVBMC will need to be periodically updated (e.g. before partner meetings). This first version will serve as input for deliverable 2.2 (deadline 30/04/2024). Each subsequent update will reflect the available information on the situation at a specific time in the project, as well as an opportunity to adjust the planned changes and desired outcomes based on the dynamics and progress in your TG.

You will see that in the tools different methods are described. We want to be clear that we do not expect the TGs to do all these things in February/March. For this first version of the implementation plan it will probably be the easiest to formulate a more general answer to the questions by discussing this in your TG stakeholder group. If you are already planning interviews, you can use those to gather some more information. The implementation plan will be a dynamic document during the project, so it is logical that over the years everything will become clearer, interviews or focus groups will be planned and all the work will contribute to new and more concrete versions of the implementation plan.

Current situation

TG and soil characteristics

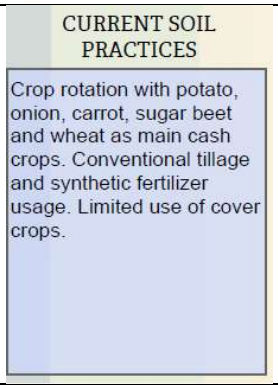
Guiding questions	Who is managing the soil involved in the TG? What are the most relevant soil-related characteristics of your TG? E.g. surface area of farms, current management type, soil quality indicators the farmers are interested in, state of degradation of the soils, … What other elements define your TG? What are the main drivers from you and your stakeholders in trying to go towards a SHBM?	**Example of summarized answer**
Tools	Soil data talks and collaboration with WP1, TG leads meetings, conversations with farmers, stakeholder interviews and meetings	

		TG AND SOIL CHARACTERISTICS Four farms in the polder region of West-Flanders with light to heavy clay soils and a combined area of 85 hectares of cropland. The soil has a degraded soil fertility compared to historical data and was compacted during wet harvesting last season.
Answer(s):	The TG is owned by a national company in the cork sector, with collaboration between regional farmers and managed by specialists in the agroforestry field. It is in Rio Frio, a region near Palmela, in Setúbal county, and encompasses 5100 hectares within a historic region known for its agriculture. This company bought the land a few years ago, which means they do not have historical data about its sandy loam soils. The Rio Frio region is marked by activities like horse riding, rice production, game production, and vineyards and has numerous natural habitats for many species, including water bodies. This TG is an agroforestry with grazing mix-system, with the production of cork and livestock. The soils are fertile and of good quality, so that has not been a problem yet. The farm does not use machinery so that the superficial cork oaks' roots do not suffer damaged. However, there is a desire to implement some known practices to manage the montado and test the effect on soil health, like stopping grazing in some parcels to see those effects, since cork production is a very large business and there is the need to make that the most environmentally friendly possible. Since the TG is owned by a big National company, an important question for the farmers is the time spent on the project, which has to be the most efficient possible. A concern shared by the managers was about the fact that there are already many studies regarding the Montado and the soil health topic, so they do not want to be repeating work and be redundant, but instead, they want to continue the work already done, proving points that were not already proven or testing new practices. Data for the evaluation framework of the SHBM will be gathered at the farm, from various parcels, using the questionnaire provided.	

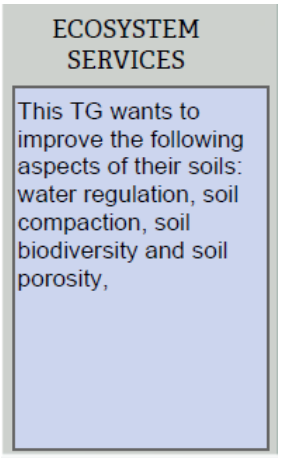
Current soil practices

You can add non-soil related practices if they help explain the TG.

Guiding questions	Summary of soil management related farming practices in your TG.	Example of summarized answer

Tools	conversations with farmers	
Answer(s):	1) Heavy machinery is not being used since there is a high risk of damaging oaks' roots and compacting the soil. 2) Use of forestry for soil structure. 3) The grazing is being managed to make the production more efficient, making use of every output of the farm, and to improve soil health. They are interested in making some changes in the livestock manure to see the direct effects on the soil health. 4) Using the animals' residues and minerals to fertilize the soil. 5) Natural erosion control through the forest system. 6) Flood control with the help of dams. 7) Mixed production systems The farm explores various productions that will increase soil health. It is a mixture of forestry with pastures, vineyards, cattle, rice production, and vegetables. This translates in many outputs, like cork, acorns, livestock, etc.	

Ecosystem services

Guiding questions	What are the ecosystem services that the TG is currently providing and would be interested in further exploring/improving/marketing/…? Why these ecosystem services? Is there a difference between which ecosystem services stakeholders want to focus on? If so, why is that? Do some stakeholders not want to work with ecosystem services? If so, why?	Example of summarized answer 
Tools	WP1 translates current soil practices into set of ecosystem services. A selection could be made by TG leads, farmers and other stakeholders in meetings or focus groups.	
Answer(s):	In the present, the farm is provisioning services by producing cork even for exportation. They are really investing in plant productivity, hence the desire to reduce livestock in some parcels and increase the number of oaks.	

	The Montado system has great potential for carbon accumulation in tree and herbaceous biomass and in the soil since it helps accumulate biomass and organic matter at the soil surface and increases nutrient availability. The trees in each system enable the storage of greater amounts of above-ground carbon than the comparable agricultural system (monocultures and open grasslands). Additionally, the Montado has an important role in the soil structure and, consequently, increases its resistance to degradation. Among the services that forest ecosystems provide to society is carbon sequestration, mitigating greenhouse gas emissions (carbon dioxide) into the atmosphere. In terms of biodiversity, the spatial and temporal heterogeneity of the Montado, unusual in the context of European agroforestry ecosystems, promotes a richness of ecological niches. The different degrees of cover (often with trees of different ages), shrubs and herbaceous cover give the Montado great diversity in the vertical and horizontal structure of the vegetation. Furthermore, the irregular nature of the landscape of the Montados, where gradients are accompanied by diffuse rather than rigid geometries with sharp edges, makes each Montado area unique and unrepeatable, important to the various communities of living beings. Much of the characteristic vegetation of the Montado is classified as endemic and native, having a high conservation status and potentially constituting priority habitats. Through pollen and acorns, the Montado can also be a good source of reproduction, offering good genetic diversity. Genetic variability is an essential component of adaptation and therefore of the and therefore the survival and stability of forest ecosystems in the face of climate change, pests and diseases and other factors. Finally, the Montado plays a big role in Cultural Ecosystem Services, since it provides physical and intellectual interactions with ecosystems and landscapes that will ultimately offer non-material benefits that people can obtain through cognitive development, spiritual achievement, recreation and aesthetic experience.

Current resources

These might be human resources (e.g. experience, expertise, inspiring people), physical resources (land under independent control, infrastructure to hold meetings), financial resources (additional subsidy opportunities, farms with some financial reserves) or other.

Guiding questions	What are some essential ingredients in your current TG that could lead to success? Why?	**Example of summarized answer**
Tools	TG core meetings and stakeholder consultation	

		
Answer(s):	The farmers have considerable experience in managing the Montado mix-system. They are divided into: a manager, a couple of individuals responsible for the Agroforestry system and a person responsible for the livestock and vineyards. Additionally, they have a few other coworkers on the TG, with different roles and responsibilities. The company that owns the farm has great influence in the field, enough resources and a big influence between farmers and with presence along the value chain. This TG has a big land area with a mixture of crops, including vineyards, and new buildings with offices and meeting rooms. There are a few other financial programs for the Montado system and its SES. Farmers are very interested in research around the quantification of possible SES they could eventually offer, and in the improvement of the ones they already have. They have their own machinery and facilities to help manage the farm, including a regular lab where they perform all soil analysis. The company also has big and stable connections with the sector worldwide having a great reputation.	

Existing partnerships

Feel free to add any other relevant information, such as existing collaboration between partners outside of the TG.

Guiding questions	Who would you consider your main partners in the TG now, and what is their main contribution? How clear is the collaboration currently? Does every partner know how and when to deliver on their commitments?	Example of summarized answer 
Tools	TG leads identify the main partners driving the TG and what the focus of the collaboration is (with TG leads and/or between themselves)	
Answer(s):	The main partner is Amorim S.A. which will contribute with their knowledge about the Montado system, providing experts in the production. By now, we are defining	

	specific roles, so that the work does not become redundant with the existing studies. CONSULAI will provide more research work, doing a background analysis, so that together we can choose the best practices to test on the TG. We are also aiming to establish a partnership with research institutions in Lisbon and an interesting spin-off company working on carbon compensation schemes. Additionally, the TG has partnerships with APORMOR, for the livestock business, AVIPE regarding the vineyards, and Amorim S.A. for the cork business. They can also have relationships with international identities. CONSULAI is hosting a synergy event called *"Jornadas Técnicas do Montado"* aggregating several HE and H2020 projects with research activities related to the Montado. SoilValues Portuguese TG will also take part and use this event to enhance the project visibility and connect with more land managers working on the agroforestry sector in Portugal. Upon discussing with the land managers, the TG is considering including some researchers that have developed interesting work in the montado, namely biodiverse sown pastures. It could be an interesting opportunity to further develop this research with SoilValues resources.

Common needs

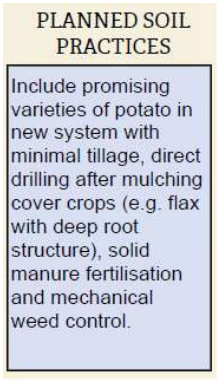
The common needs are identified as part of the current situation. We propose doing this aspect in two steps: 1) Identify what each separate stakeholder needs or expect from the SoilValues project and the TG at this time, 2) Try to find common needs that multiple stakeholders can work together on which helps the TG progress in the immediate future.

Guiding questions	What are some essentials the TG needs right now to progress? Are these things stakeholders agree on? If not, where do the needs of your stakeholders differ?	Example of summarized answer
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	

		COMMON NEEDS In order for the TG to succeed, it needs to find a way to finance the various investments required (e.g. options for co-owning or renting mechanical weed control machinery) and gain better insight in the economic consequences of the planned changes to their farms. Farmers and stakeholders agree that they need some soil sampling to establish a baseline. The TG needs inspiration and consistent advisory services to farmers during the planned period of transition.
Answer(s):	The land managers wish to deepen the contact with soil health experts to make sure their decision-making process is aligned with their long-term goals. For this to transpire it is necessary to establish a cooperation with the researchers (national and European). With AMORIM there is an opportunity to perform interesting active research experiments in a commercial farm that can be scaled-up to other Montado farms across Portugal and Spain. The desire to improve SES and deepen the role of the Montado system in this topic. Interest in improving soil health to improve productivity. For the TG to succeed, it is needed an evaluation of the various studies regarding the Montado and its best soil health practices to develop a more practical and efficient way to proceed with the sampling and to plan the best course of action. For this, the TG would like a more active participation of the expert panel from the project. There is a common understanding that soil sampling will be necessary throughout the project to test the effects and impacts on soil health of the newly implemented practices.	

Planned changes and desired outcomes

Planned soil practices

Guiding questions	What are the soil practices the TG has planned in going towards a SHBM? If no changes in soil practices are planned (e.g. when the aim is to valorise existing ecosystem services provided) you could use this section to explain why.	Example of summarized answer 
Tools	Stakeholder interviews, meetings and focus groups	
Answer(s):	One of the practices that the TG wants to test is removing livestock from some parcels to compare those with the ones that are being grazed. Additionally, in those parcels, the number of trees will increase, to see the effects of that productivity increase on the soil health. This effect can be analysed by considering the soil structure, soil organic carbon, plant productivity, and water retention capacity. Another possible practice to implement is non-selective grazing because now, the cattle are only eating the best forage and leaving behind the worst. This translates to several problems, like negatively impacting biodiversity and plant production. The solution is to reduce the paddock's size so that the animals are forced to eat everything in that area becoming less selective while grazing. There is a concern regarding the soil compaction risk of this practice, however, the farmers are confident that the risk is significantly reduced if they manage to test this at the right time of year (with less rain for example). After analysing the soil practices and the studies already done in the Montado system, we will plan other possible studies to implement in the TG.	

Common goals

The common goals are identified as part of the planned changes. Like with the common needs, we propose doing this aspect in two steps: 1) Identify what the goals are for each stakeholder (or a selection of stakeholders) within the SoilValues project and the TG and 2) Combine these goals in some sort of 'mission statement' for your TG. If possible you could also include goals from CoP members.

Guiding questions	What are the main goals your stakeholders (or each type of stakeholder) have within the TG? Can stakeholders formulate a 'mission statement' together, or do some of these goals contradict each other?	Example of summarized answer
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	

		COMMON GOALS The core TG has reached out to some members of the CoP and has decided to work towards these common goals: Produce and distribute food in a profitable and sustainable way while also enhancing the regional identity of farmers and become more climate-adapted to droughts and floods.
Answer(s):	The land managers are interested in: Producing oak in the most sustainable way possible, and for that there is the need to evaluate every possible scenario and test what the best practices for that are. These best practices also must guarantee good and improved soil health. Considering the region where the TG is located, it is important to take advantage of the soil characteristics and region's climate, since the region is not known for its drought season like many Portuguese regions are. The livestock management needs to be more sustainable since they must contribute to the Montado system, by providing organic fertilizer for example, and offering some other ecosystem services. Together with the project, the land managers are also interested in understanding exactly what are the soil-health benefits that improve the Montado health and eventually lead to the improvement of cork quality. Ultimately, the land managers and TG Leaders hope that there is enough data to conclude what are best practices to achieve optimal cork production.	

Stakeholders

Guiding questions	What are the main categories and roles of stakeholders you are looking to involve to get the TG and CoP moving towards those desired outcomes and long-term goals? What are some concerns or obstacles that would prevent you from involving these stakeholders?	Example of summarized answer
Tools	Stakeholder interviews, meetings and focus groups (including CoP?)	

		STAKEHOLDERS The TG wants to reach more farmers, but are struggling to connect to conventional farmers. Also, they aim to involve farmer advisory bodies in a supporting role, but do not have the finances to pay them at this time. Farmers want to explore talks with small-scale investors for the new machinery required for mechanical weed control. The retailer would like to connect to similar initiatives in Belgium or Europe. The province wants to connect with local nature-conservation groups to organise the agro-tourism walking route.
Answer(s):	Amorim S.A., providing lands and Montado managers with experience in agroforestry. Amorim has a strong presence across the values chain of cork products. So, it would be interesting to include the insights of cork processing industry. ILVO/Wageningen Uni .researchers which will provide knowledge and coordinate the project. CONSULAI which will help lead the TG and will have an advisory role. Portuguese Researchers that have worked in different thematic around the montado: carbon sequestration, virtual fences, biodiverse sown pastures, OM content, etc. The Herdade de Rio Frio is a big estate with more than 4.000 ha. Meaning its landscape management has impact on the region and the people who live in it. The civil society, by schools or tourism, should have a close interaction with the farm. At a later phase, CoP stakeholders, which will help make decisions through knowledge sharing between farmers, advisors, research and educational institutes, NGOs, etc.	

What value is being created?

The creation and distribution of value is a central aspect of the SoilValues project. From a research perspective, WP2 is interested in what various stakeholders find valuable and how this reflects on their willingness to commit resources and their values as organisations or human beings. However, stakeholders interacting with your TG are interested in more practical questions. This gives broadly two options in how to answer this question for a TG: 1) Directly ask stakeholders during a workshop or interviews and 2) identify and summarize stakeholder perceptions of value based on their stated preferences in the common needs, common goals, and other interactions.

In this first implementation plan this will probably be a more general description (see example). The more in-depth research we want to do on values within WP2, will be discussed at the next project meeting in Wageningen.

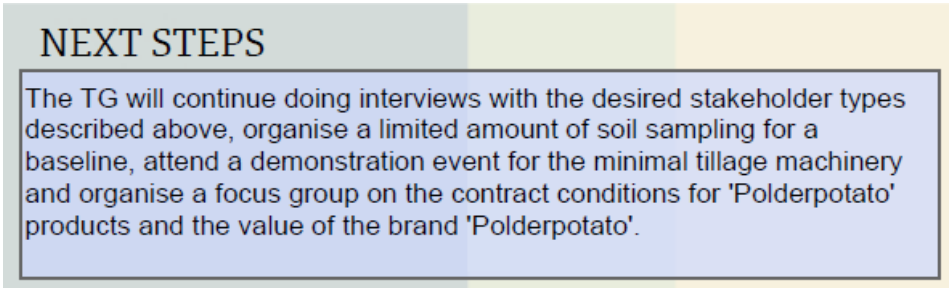
<table>
<tr><td>Guiding questions</td><td>What do the main stakeholders/stakeholder types find valuable in the planned changes?
What kind of contributions would stakeholders make in exchange for changes they find valuable?</td><td rowspan="2">Example of summarized answer
WHAT VALUE IS BEING CREATED?
Farmers: cost-reductions, positive image and a perceived better food quality.
West-Flanders province: water regulation, soil health improvements, agro-tourism, positive image.
Retailer: positive image, new product line, potential for showcasing results to other farmers in their supply chain</td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups (including CoP?)- Economic data and bio-economic model WP1?</td></tr>
<tr><td>Answer(s):</td><td colspan="2">Strengthening the farm’s productivity while retaining its value, like its infrastructures, management, and reputation.
Trying to reduce costs (since the livestock will decrease and the plant productivity will most likely increase).
Try to improve Ecosystem services by changing some practices to become more sustainable, improving water retention capacity, soil structure, etc.
These changes will not have to be necessarily more profitable but will test the possible outcomes from the practice changes.</td></tr>
</table>

How is value shared?

<table>
<tr><td>Guiding questions</td><td>How do you intend on linking incentives with the planned changes? What do your stakeholders think about the division of created value between them?</td><td rowspan="2">Example of summarized answer
HOW IS VALUE SHARED?
Farmers want to negotiate fair contract conditions with the retailer, creating value around the new brand of 'Polderpotato' and resulting in sufficient price premiums being paid. The retailer wants to use this brand in regional marketing.
The province will provide administrative support for the enhancement of regional identity.
ILVO will provide knowledge support in exchange for data collection.</td></tr>
<tr><td>Tools</td><td>Stakeholder interviews, meetings and focus groups (including CoP?)- Linking up with WP4 regarding incentives and valuation?</td></tr>
</table>

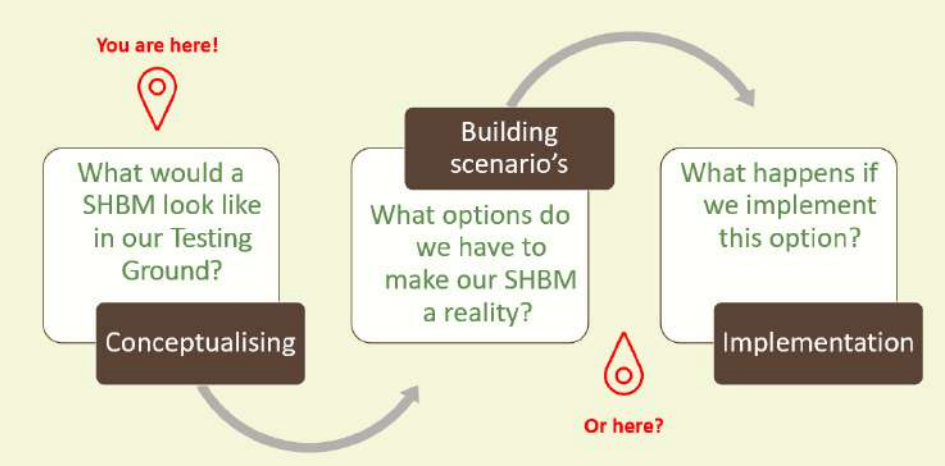
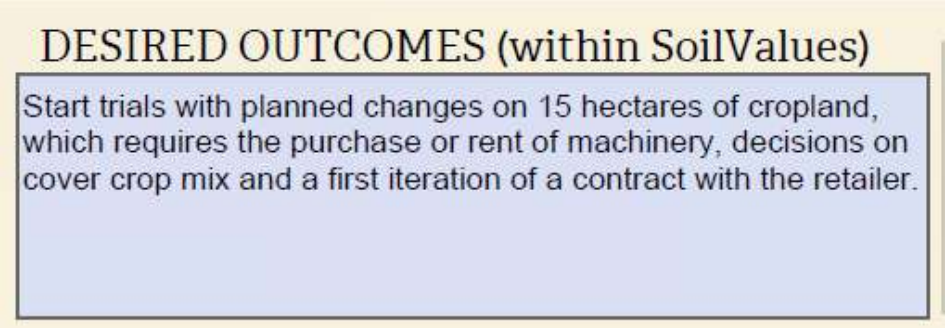
Answer(s):	Since AMORIM is present along all value chain, probably it will not make a lot of sense to analyse the perspective of shared value regarding cork production. Apart from cork production, the TG offers several activities including cultural ones, like game production, rice and vegetable production, or vineyards. If the soil health is improved, productivity will also improve, resulting in higher quality outcomes that will positively impact the consumers. If the new management techniques maintain the soil healthy where it already is, and increase soil health where it is poor, the health of the montado will grow and the (man-made) natural landscape will prosper. This mean that other activities related with culture and tourism may also increase their value. There is, ultimately, a strong knowledge sharing within the sector, and through the CoP at a later stage of the project.

Next steps

Guiding questions	What specific steps will you be taking in the next period (e.g. between now and the next partner meeting) within your TG to address your common needs and work towards the common goals and desired outcomes?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	
Answer(s):	Analyse previous studies done in the Montado theme, like biodiversity relationships, carbon sequestration in the Montado, relationships between agroforestry and cattle, best practices in the agroforestry business, etc. Analyse the soil data collection needed for the desired outcomes and plan the next data collection. Establish a relation with a specific research community in Portugal that has already been identified. Propose a partnership to further develop their research while producing results that are aligned with the main objectives of SoilValues like the validation and scale-up of SHBM.

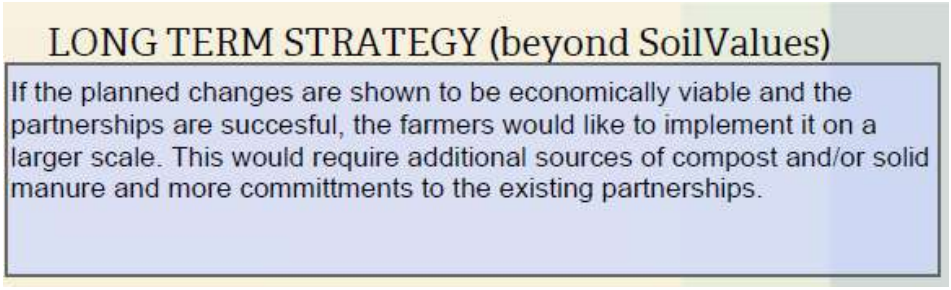
	Encourage a meeting between the TG and WP1 to discuss the best strategy for adapting of the work package needs to the Portuguese TG, with its specific characteristics since it is the only agroforestry-based TG and there are a lot of requirements and questions that do not apply to this case.

Desired outcomes (within SoilValues)

Guiding questions	In broad terms, what would your TG like to achieve by end of the SoilValues project? What position would you like your TG to be at that time? 
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	
Answer(s):	The TG would like to have, by the end of the project, a list of proven best practices to implement on the farm, and at the same time, improving the decision-making process to increase and obtain optimal cork production, while being sustainable. In particular, land manager would like to understand the effect of the animal presence (load) in certain parcels in soil (compaction and OM content), bush control, and forest renovation. These three thematic are all crucial to achieve a sustainable management of the montado. The biodiverse sown pastures are also carefully linked with animal presence and the no till/minimal till practices. Complete the data collection so that there is a thorough analyses and useful results for the farm.

Goals and strategy (long term)

Goals and strategies in the long term likely depend on achieving certain outcomes within the SoilValues project. In that case, you could formulate a conditional statement like in the example below.

Guiding questions	What would your TG like to achieve in the long-run, going beyond the SoilValues project?
Tools	Meetings with stakeholders who will be most involved in this phase of the TG, which are likely the current 'core' TG stakeholders
Example of summarized answer	
Answer(s):	If the planned changes are shown to be useful, economically viable and with significant results, Amorim would like to scale up those changes to the rest of the farm and to other montado farms they own across the country. The main goal is to achieve optimal cork production through environmentally friendly practices that improve soil health. The land managers are also interested in carbon auditing and eventual incentives that are available in volunteer or regulated markets. Additionally, the best practices will be shared within the agroforestry sector to enable the general adoption of soil health practices.