

# Final version of Assessment methodology for Study Sites

## Executive Summary

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### Report Information

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## Executive summary

The overall aim of the EU-funded project SoilCare is “to assess the potential of soil-improving cropping systems and to identify and test site-specific soil-improving cropping systems (SICS) that have positive impacts on profitability and sustainability in Europe”. The main aim of WP4 is to develop a comprehensive methodology for assessing both benefits and drawbacks of different cropping systems at the farm level, which served to set-up monitoring (D4.2 – Monitoring plan) as which will be used for evaluation purposes (D4.1 – Assessment methodology and D5.3 – Report on monitoring results and analysis). D4.1 presented here, consists of developing a methodology for the assessment of the benefits, drawbacks, profitability, soil quality, and the sustainability of the SICS as compared to the control field.

This deliverable is based on an in-depth review of frameworks, literature, and indicators established within Task 4.1, the review of soil-improving cropping systems (D2.1) carried out by WP2, and collaboration with WP5, WP3, and WP6 regarding the environmental, social, and economic dimensions, respectively.

Application of the assessment methodology requires data on implemented SICS and their effects. For this purpose, different tasks and related deliverables have been realized within SoilCare project:

1. The monitoring plan (D4.2, M24) including instructions on how to collect data required for evaluation by the Case Study Site (CSS) teams and provided to WP4 and WP5 for storage and analysis.
2. Database with monitoring data (D5.1, M58) to store data obtained in the field experiments in a standardized and accessible format.
3. Final version of the assessment methodology for Study Sites (D4.1, M58) (this report).
4. Report on monitoring results and analysis (D5.3, M60) to evaluate the practical usefulness of the assessment tool developed in WP4, its applicability as well as its outcome concerning the overall sustainability (environmental, economic and sociocultural dimensions).

Taking into account all considerations derived from the literature review that we did, there is no existing framework that is suitable for SoilCare since the term ‘soil improving cropping systems’ is relatively new and its scientific underpinning as such is still lacking (see D2.1). Therefore, the SoilCare assessment methodology proposed here is based on useful and applicable elements identified from the existing frameworks.

To set up a tool for the assessment of the overall sustainability, we choose a decision tree based on weights (%) because it allows simple aggregation to assess the three dimensions of sustainability, and provides flexibility. It breaks the sustainability assessment decisional problem down into simpler units as a function of sustainability dimensional structure (economic, social and environmental), that relates quantitative as well as qualitative elementary criteria rating cropping systems. Such flexibility is needed as the data for the 3 dimensions include various kinds of quantitative and qualitative data, obtained in various ways, including monitoring and questionnaires (see D4.2).

We have established two versions of the assessment tool: (i) a simple one consisting of checking whether the difference between SICS and control reflects a positive impact, negative

impact, or no (or zero) impact; and (ii) a more complex one based on threshold values. This distinction is based on the fact that the initial value of a given property of the control can be good or bad and can result in a higher number of variations when compared to the value of the same property of the SICS.

In this report, we provide the general concept of the assessment tool that entails the different steps followed for the aggregation to realize an index for the overall sustainability of the SICS under consideration. We provided information on the indicators, their weighting factors, their threshold values, and their scores with regard to the thematic clusters found at the Case Study Site (CSS). A guide for the assessment tool is also provided to explain how to use the tool and an application was done with the data measured in the CSS of Germany.

The validation of the assessment tool is planned within task 5.4 on monitoring results and analysis (D5.3, M60) to evaluate its practical usefulness, its applicability as well as its outcome regarding the overall sustainability. During this phase of application, further improvement could be possible. It consists mainly of refining some threshold values to take into account various conditions. Due to its flexibility, the tool can be adapted to different land management practices and cropping systems allowing a wide dissemination and uses at the European level.