

Policy analysis:

Promoting SICS adoption in Brittany, France

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Report number: **26**

Deliverable: -

Report type: **Scientific Report**

Issue date: **18/06/2021**

Project partner: **Milieu**

Version: **1.0**



| DOCUMENT SUMMARY | |
|---|---|
| Project Information | |
| Project Title: | Soil Care for profitable and sustainable crop production in Europe |
| Project Acronym: | SoilCare |
| Call Identifier: | H2020-SFS-2015-2b |
| Grant agreement no.: | 677407 |
| Starting Date: | 01.03.2016 |
| End Date: | 31.08.2021 |
| Project duration | 66 months |
| Web-Site address: | www.soilcare-project.eu |
| Project coordinator: | Wageningen Environmental Research (WEnR) |
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| Report Information | |
| Report Title: | Policy analysis: Promoting SICS adoption in Brittany, France |
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| Deliverable Number: | - |
| Work Package: | WP7 |
| WP Leader: | Milieu |
| Nature: | PU |
| Dissemination: | Document |
| Editor (s): | - |
| E-Mail(s): | - |
| Telephone Number(s): | - |
| Report Due Date | - |
| Report publish date: | 18-06-2021 |
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| 10 | Milieu LTD | MLTD | Belgium |
| 11 | Norwegian Institute of Bioeconomy Research | NIBIO | Norway |
| 12 | Bodemkundige Dienst van België | BDB | Belgium |
| 13 | Aarhus University | AU | Denmark |
| 14 | Game & Wildlife Conservation Trust | GWCT | United Kingdom |
| 15 | Teagasc | TEAGASC | Ireland |
| 16 | Soil Cares Research | SCR | Netherlands |
| 17 | Instituto Politecnico De Coimbra | IPC/ESAC | Spain |
| 18 | National Research and Development Institute for Soil Science, Agrochemistry and Environmental Protection | ICPA | Romania |
| 19 | University of Padova | UNIPD | Italy |
| 20 | Institute of Agrophysics of the Polish Academy of | IAPAN | Poland |
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| 28 | Scienceview Media BV | SVM | Netherlands |

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Executive summary

In the study site area in Brittany, France, soil-improving practices such as biological pest management, green manure, and organic fertilisers are methods already applied by farmers. The Soil-Improving Cropping Systems (SICS) tested by the SoilCare project include the use of different cover crops (oats versus mixed cover crops, interseeding cover crops in maize) and soil cultivation measures to shift or eliminate tillage (early sowing of wheat, direct sowing of maize in cover crop). The trialed practices aim to address the main soil threats found in the area, compaction, weeds, and low soil fertility and therefore represent important practices that might benefit soil health in the region if widely taken up.

Policy shortcomings and opportunities

The table below provides an overview of policies promoting the full range of SICS covered by the SoilCare project (shaded in light green). The analysis shows that several policies regulate and incentivise the use of cover crops and reduced tillage, including the CAP GAEC standards, and the CAP Greening Payment Requirements. In addition, environmental and water policies establish cover crop and tillage management requirements for certain areas.

Table 1: Coverage of SICS in current regional policies, instruments and measures in Brittany, France

| Policy | Crop rotation | Green manures, cover crops, catch crops | Integrated nutrient management | Enhanced efficiency irrigation | Controlled drainage | Reduced tillage | Integrated pest management | Smart weed control | Smart residue management | Controlled traffic management | Integrated landscape management |
|---|---------------|---|--------------------------------|--------------------------------|---------------------|-----------------|----------------------------|--------------------|--------------------------|-------------------------------|---------------------------------|
| CAP GAEC Cross-compliance Standards | | | | | | | | | | | |
| CAP Greening payments | | | | | | | | | | | |
| Rural development programme for Brittany | | | | | | | | | | | |
| Law for the Future of Agriculture, Food and Forests | | | | | | | | | | | |
| Investment supports for farms | | | | | | | | | | | |
| Environmental Code | | | | | | | | | | | |
| Rural and Marine Fishing Code | | | | | | | | | | | |
| Law on Water and Aquatic Environments | | | | | | | | | | | |
| Nitrates Regulation | | | | | | | | | | | |
| Plan Ecophyto II | | | | | | | | | | | |

Evidence gathered through interviews, desk research and a stakeholder workshop shows that different contextual factors contribute to and undermine the uptake of SICS in general, and of the practices tested in the study site in particular. Some of the findings suggest that the uptake of SICSs is improving. On the other hand, barriers to the uptake of these practices remain.

The key factors shaping the success of policy instruments include:

- Environmental conditions
- Lack of solidarity between farmers
- Changing policy objectives
- Top-down approaches to policy design and implementation
- Lack of a dedicated soil policy
- Insufficient policy enforcement and impact monitoring
- High transition costs
- Lack of targeted incentives
- Need for education and training

The table below provides an overview of barriers and enablers for the SICS tested at the study site and which were identified by stakeholders during the adoption workshop. Participants were asked to identify actions for the most important factors affecting SICS adoption; therefore, not all adoption factors were discussed in detail. To assess the effectiveness and feasibility of an action, a scale from 1 (not at all effective/feasible) to 4 (highly effective/feasible) was suggested but not applied during the meeting due to time constraints.

Table 2: SICS being tested, adoption factors (enablers or barriers) and actions to overcome the barriers/support enablers identified by stakeholders

| Adoption factors (+ or -) | Actions |
|---|--|
| Lack of coherence between policies (-) | More specific focus on soil health in policy |
| Top-down policy design (-) | Incorporating grass-roots movements into the implementation of policies, policies that can be tailored to specific circumstances |
| Costs of new practices in the short and long-term (-) | Better use of financial support mechanisms (for instance subsidies for specific crops) to counter the negative impacts on farmers, especially in the short-term. |
| Environmental conditions, e.g., soil type (-) or (+) | <i>None identified</i> |
| Lack of awareness and education among farmers (-) | Encourage peer to peer learning and training |

Recommendations for actions to promote the uptake of SICS

Based on this analysis, and feedback collected from stakeholders, the following recommendations were formulated:

- **Consider the development of a dedicated soil policy:** despite the existence of policies incentivising and regulating the use of SICS in Brittany, their focus is not specifically soil related. While it is clear, both from the interviews and looking at the issues reported by grass-root organisations, that farmers are aware of soil threats in the region, the instruments in place may potentially reward behaviour which, while not detrimental to the environment, cannot be considered soil-improving. The development of a dedicated soil policy should therefore be considered. Such an intervention should be designed to accommodate farm diversity, featuring a robust monitoring and enforcement system.

- **Revise the existing policy framework to include long-term targets:** different priorities put forward by policies over time can create undesirable effects which are sometimes hard to remedy. An example from the region is the focus modernisation of farming in the last decades which led to practices that are today considered unsustainable. Policy design should incorporate the longer-term benefits and integrate a more holistic approach so that elements like soil which necessitate longer cycles can also be considered.
- **Provide tailored support to farmers transitioning to sustainable practices:** financial instruments should allow long-term change in practices rather than finance one off interventions. They should be designed in a way that offers integral solutions to farmers, for instance they should cover costs associated with machinery or other investments associated with change, which are important barriers for farmers.
- **Introduce more targeted financial incentives:** incentives should be more targeted and tied to specific actions to result in the desired change. For example, a subsidy could be tied to the use of a specific crop rather than a target such as “reduce the amount of maize grown” as it is currently done by the RDP for Brittany.
- **Offer regular training and information services to keep farmers informed about new developments and insights:** dissemination of knowledge, awareness raising, and education are important components of policy interventions and they should be used in parallel with economic and legislative instruments. Regular training, informative sessions on latest innovations are preferred to one off training sessions which have limited impact.
- **Engage with farmers and trusted organisations to deliver advice and training:** peer to peer learning and bottom-up initiatives are powerful tools to deliver knowledge to farmers as they play a great degree of trust in their fellow producers. There are examples of successful voluntary initiatives that are considered very effective in changing convictions and practices. Among those, farmers’ groups are especially important. Such groups have a greater success of convincing farmers to adopt SICS for several reasons and can help demonstrate how to adapt practices and targets to specific geographic or other constraints, which may make SICS adoption more attractive to farmers in the region. These voluntary initiatives can be supported by direct education to provide a better understanding of the benefits of SICSs to farmers, especially targeting the older generation of farmers.
- **Involve farmers in policy-design and implementation:** to ensure compliance with policy instruments, design appropriate measures, and foster innovation, farmers not only need to be better informed about policy instruments but should also be involved in their design and implementation, to the extent possible. This will be especially crucial for the national and regional implementation of EU policies, most importantly the post-2020 CAP which will give greater flexibility to Member States when designing their Strategic Plans. In this regard, one stakeholder at the adoption workshop suggested to

experiment with new instruments or policy tools at a local or sub-regional scale first and then analyse the impact before their adoption on national/regional level.

1 Introduction

Soil is increasingly recognised as a crucial resource providing products such as feed, fibre, food and fuel as well as critical ecosystem services including water storage, filtration, and carbon sequestration. Soil offers a habitat for billions of organisms and is the foundation for our cities and towns. Despite its recognised importance in sustaining ecosystems functions, human life and economic activities, soil is being over-exploited, degraded and irreversibly lost due to inappropriate land management practices, industrial activities and land use changes that lead to soil sealing, contamination, erosion, and loss of organic carbon.

Agriculture occupies a substantial proportion of European land and consequently contributes significantly to various forms of degradation. The uptake of innovations associated with potential benefits to soil quality, such as precision farming and conservation agriculture is slowly expanding across Europe. However, these are often not adopted to their full potential and in some cases are eventually abandoned, and the question remains as to why support and adoption of these practices by European farmers is still considerably weak (e.g., Lahmar 2010).

Research aim and questions

The work presented here was carried out as part of the EU-funded SoilCare project.¹ The overall aim of SoilCare is to identify, evaluate and promote promising soil-improving cropping systems (SICS). SoilCare defines SICS as cropping systems that improve soil quality (and hence its functions), and that have positive impacts on the profitability and sustainability of agriculture. Cropping systems refer to crop type, crop rotation, and associated agronomic management techniques (see Table 3).

Table 3: List of promising general SICS²

| Component | Expected impact |
|--|---|
| Crop rotation | Improves crop productivity, soil biodiversity and system sustainability; decreases need for pesticides and risk of erosion |
| Green manures, cover crops, catch crops | Improves Soil Organic Matter (SOM) content, soil structure, soil biodiversity, nutrient use efficiency; decreases nutrient leaching, run-off, erosion |
| Integrated nutrient management | Improves crop productivity, soil nutrient status and resource use efficiency; |
| Enhanced efficiency irrigation | Improves crop productivity and resource use efficiency; minimizes risks of salinization and desertification |
| Controlled drainage | Improves crop productivity and resource use efficiency; minimizes the risk of waterlogging |

¹ SoilCare: Soilcare for profitable and sustainable crop production in Europe, <https://www.soilcare-project.eu/>

² D2.1 – A review of soil improving cropping systems, available at : <https://www.soilcare-project.eu/downloads/public-documents/soilcare-reports/75-report-06-d2-1-a-review-of-soil-improving-cropping-systems-wenr-oene-oenema>

| Component | Expected impact |
|--|--|
| Reduced tillage | Reduces energy cost and may enhance SOM content and soil structure; may increase the need for herbicides/ pesticides |
| Integrated pest management | Improves crop productivity and resource use efficiency; minimizes the loss of biodiversity. |
| Smart weed control | Improves crop productivity and resource use efficiency; may decrease the need for herbicides |
| Smart residue management | Reduces evaporation and soil temperature; may increase/decrease the success of germination |
| Controlled traffic management | Reduces energy cost and the risk of soil compaction |
| Integrated landscape management | Improves biodiversity and cropping systems sustainability |

The main aim of the work presented here was to formulate policy alternatives³ and actions at EU and study site level to facilitate the adoption of soil-improving cropping systems. Understanding common barriers to the adoption of soil improving practices is an important prerequisite for identifying and designing policy measures to encourage farmers to adopt effective soil conservation practices. A second important foundation for developing appropriate policies is an appreciation of the effectiveness of soil conservation policies in agriculture.

A starting point for any policy analysis is to recognise the success and failures of different types of policy – whether they are regulatory instruments, economic instruments, voluntary instruments, or educational/information instruments. There is plenty of academic research available on the efficiency and effectiveness of these instruments in general, and it is beyond the scope of this Country Report to assess them in detail. However, it is important to recognise the limitations of each, as many of the success and failures of national soil policy may be attributed to the fundamental successes and failures of the types of policy. Table 2 below provides a summary of the different types of policies.

Table 4: Summary of policy approaches

| Policy approach | Premise | Positive attributes | Negative attributes |
|-------------------------------|-----------------------------|--|--|
| Regulatory instruments | Force farmers to adopt SICS | <ul style="list-style-type: none"> Levels the playing field between competitors, as everyone must play by the same rules Fairly consistent (often long-term) | <ul style="list-style-type: none"> Inflexible regardless of individual situations May be costly to implement Monitoring and enforcement can be costly Discourages innovation |

³ Policy, loosely defined, is “officially accepted set of rules or ideas about what should be done” or “a system of courses of action with a common long-term objective (or objectives) formulated by governmental entities or its representatives” (see <http://learnersdictionary.com/definition/policy> and <https://www.thefreedictionary.com/policy>). Policy alternative refers to a set of different types of policy options including economic instruments, regulatory instruments, planning instruments and information/knowledge instruments.

| Policy approach | Premise | Positive attributes | Negative attributes |
|--|--|--|---|
| Economic instruments | Incentivise farmers to adopt SICS using subsidies and taxes etc. | <ul style="list-style-type: none"> • Encourages innovative methods • Can offset cost of implementation and/or discourage adverse behaviour • Allows a certain amount of flexibility | <ul style="list-style-type: none"> • Can be subject to fluctuations as the market fluctuates • High likelihood of setting subsidies/taxes at incorrect rate (which leads to inefficiencies) • Can be subject to game-playing behaviour |
| Voluntary instruments | Encourage farmers to adopt SICS | <ul style="list-style-type: none"> • Sense of “ownership” as the decision was taken freely • High degree of flexibility | <ul style="list-style-type: none"> • Does not guarantee implementation |
| Educational/information instruments | Educate farmers so they understand the importance of SICS | <ul style="list-style-type: none"> • Implementation as a result of truly understanding the impacts of the actions • High degree of flexibility | <ul style="list-style-type: none"> • Does not guarantee implementation • Relies on interest of affected parties • Often takes more time to become effective |

Against this background, the following research objectives were formulated at the outset of the work:

- A. To identify existing policies and policy instruments at EU-level as well as national and (sub)regional level in the 16 SoilCare countries promoting soil quality, and particularly the adoption of soil-improving cropping systems.
- B. To describe the intended mechanisms and impacts of existing policies, instruments, and practices.
- C. To assess the extent to which existing policies, policy instruments and practices promote the adoption of soil-improving cropping systems.
- D. To identify contextual factors, particularly institutional settings, influencing policy impact on farmer adoption.
- E. To identify existing policies, policy alternatives and complementary actions that could promote the uptake of SICS.
- F. To assess the performance of good policy alternatives, their advantages, and disadvantages.

This report presents an inventory and analysis of bottlenecks and opportunities in sectoral and environmental policies to facilitate the adoption of SICS in France and fits into a larger research

initiative involving 16 European countries in total.⁴ Based on this analysis, it presents policy alternatives and actions for the national and/or (sub)regional level with the potential of promoting the uptake of SICS.

Methods

The research and preparation of this report were undertaken by two groups of researchers – the core team of the task, who were responsible for the preparation and research for EU-level policy and all 16 study sites, working in close coordination with researchers with specific knowledge about the study site – the study site researchers. This approach ensured that there was both consistency between the 16 country reports, of which this French report is but one, but local knowledge and documents and information in local languages were also well utilised.

Figure 1 illustrates the overall study design and methods, which were applied to answer specific research questions. Whilst each data collection activity focused on a sub-set of the research questions, they are closely related, and the information gathered through the mix of methods applied were used to feed into different research questions.

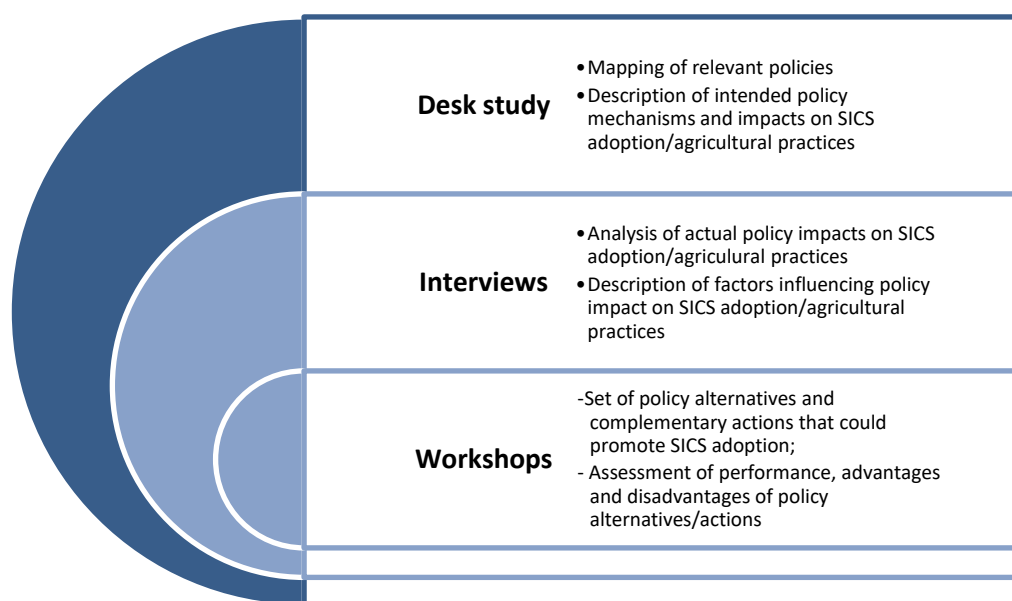


Figure 1: Research strategy

Data collection and analysis involved the following three activities:

1) A desk-study of policy documents (in the broadest sense) and relevant literature:

⁴ The 16 countries include 13 EU Member States, i.e., Belgium, Germany, France, Czech, Poland, Hungary, Romania, Denmark, Sweden, Greece, Spain, Italy, and Portugal and three non-EU countries, i.e. UK, Switzerland and Norway.

policies potentially impacting the adoption of SICS in the study sites were identified. The aim of this step was to provide a broad overview of soil-related national and regional⁵ policies from which the most relevant policies could be selected for in-depth analysis. A draft inventory was compiled, including those national, regional, and sub-regional policies that were linked to a set of pre-selected EU policies (primarily concerning environmental and agricultural topics); however, in the case of regional and sub-regional policies, these were limited to those directly relevant to the study site (i.e., not all regions and sub-regions were included). For each policy, the following information was recorded: date of adoption, governance scale, type of instrument, link to cropping system (components) etc.⁶ Based on the screening done in the first step, the national and regional policies deemed most relevant for the study site were subject to a more in-depth analysis. This was done through desk research carried out by the study site researchers.

- 2) Interviews with selected national and regional policymakers and stakeholders:** based on this analysis, Study Site Researchers then conducted interviews with policy-makers and stakeholders using a semi-structured interview guide. In France, two interviews were carried out (see Table 5).

Table 5: Organisations represented by interview partners

| Organisation | Stakeholder category |
|--|----------------------|
| Regional Council of Brittany <i>Conseil Régional de Bretagne (CRB)</i> | Regional government |
| (Regional Direction for Agriculture, Food and Forests)- <i>DRAAF</i> | Regional government |

- 3) An adoption workshop with national and regional policymakers and stakeholders:** To develop and assess policy alternatives, the Study Site Research Teams organised a stakeholder workshop in each site, following a common guidance document which detailed the structure and methods for the event. Study site teams mostly invited those stakeholders they were already working with, either within the context of SoilCare or as part of their regular engagement activities. The French workshop brought together 17 stakeholders, including farmers, policymakers, advisory services, and scientists (see Figure 2).

⁵ The term "region" refers in this context to the sub-national level, particularly the area of the country where the respective study site is located.

⁶ The policy inventory is available at: <https://www.soilcare-project.eu/outputs>

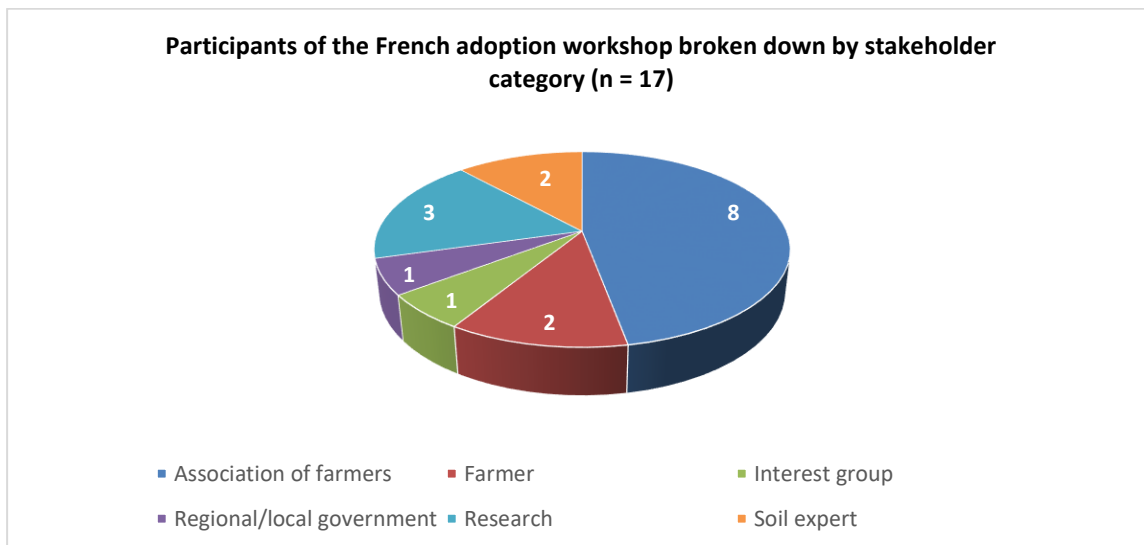


Figure 2: Types of stakeholders participating in Brittany (FR) adoption workshop

Report outline and where to find supplementary information

Section 2 of this report presents an analysis of policy instruments relevant for shaping agricultural practices in Brittany where the French study site is located.⁷ It examines how existing instruments may impact on the adoption of SICS and explores the factors which enable or hamper uptake of these practices.

Section 3, on the basis of the previous section, formulates actions which could promote a shift in agricultural practices in the study site region and facilitate a wider adoption of SICS.

A detailed analysis of all relevant EU-level policies as well as national, regional and sub-regional policies in the countries covered by this research is reported in *D7.1 Inventory of opportunities and bottlenecks in policy to facilitate the adoption of soil-improving techniques* for, available at: <https://www.soilcare-project.eu/outputs/deliverables>.

A synthesis of findings and recommendations from the EU-level and cross-country analysis can be found in *D7.2 Report on the selection of good policy alternatives at EU and study site level*, available at: <https://www.soilcare-project.eu/outputs/deliverables>.

Individual country policy inventories can be downloaded from: <https://www.soilcare-project.eu/outputs>

⁷ See D7.1 at <https://www.soilcare-project.eu/outputs>

2 Analysis of policy shortcomings and opportunities in France

This section provides a review and analysis of national instruments relevant for shaping agricultural practices in Brittany, France where the study site is located. Policies investigated include both policies implementing EU instruments as well as those initiated by France. The information is drawn from the policy inventories compiled by the Study Site Researchers as well as interviews and an adoption workshop conducted with key stakeholders.

The experiments carried out in the study sited are described below. Each field trial provides evidence on the costs and benefits.

Table 6: Overview of experiments carried out in the Brittany study site, and the SICS category and cluster under which they are grouped

| General treatment category | SICS cluster | Experiments |
|-------------------------------------|----------------------|--|
| Cover crops, reduced tillage | Soil improving crops | 1. Early sowing of wheat (to reduce tillage in autumn) |
| | Soil improving crops | 2. Cover crops (oat vs mixed) |
| | Soil cultivation | 3. Interseeding cover crops in maize |
| | Soil improving crops | |

2.1 Which existing policies and policy instruments shape agricultural practices in Brittany?

A policy analysis at the national and regional level identified the following policies which may directly or indirectly shape agricultural practices in France, with a focus on those specifically influencing soil practices⁸: The overview below provides a description of those policies identified as most important for soil-improving practices and does not intend to provide an exhaustive overview of the policy landscape governing agricultural methods in the region.

Agricultural policies

The different funding instruments established under the EU **Common Agricultural Policy (CAP)** greatly influence farming practices in the region. Direct payments are tied to farmers meeting the **Good Agricultural and Environmental Conditions (GAEC)** (*Normes relatives aux bonnes conditions agricoles et environnementales des terres, BCAE*) as well as the greening requirements set out by the policy. Among the relevant GAECs are GAEC 1 (buffer strips), GAEC 2 (irrigation), GAEC 3 (groundwater protection), GAEC 4 (soil cover), GAEC 5 (erosion control), GAEC 6 (non-burning of crop residues) and GAEC 7 (maintenance of landscape features).

CAP greening payments impact farmers' practices through the conditions set for receiving of

⁸ See the Annex for a more detailed overview of the policies described in this section.

green payments. Greening requirements were first introduced in 2015 and apply to direct payments under Pillar 1 of the CAP. Cover cropping is one of the options farmers may implement for Ecological Focus Areas (EFAs). Farmers with over 15 ha of arable land have had to devote 5% of their farmed area to EFAs to qualify for full direct subsidy payments. There are several EFA options which French farmers can choose from, all of which have the potential to improve and protect the state of the soils. These include fallow areas, terraces, buffer strips, catch crops/green cover, agroforestry, afforested areas, and short rotation coppice (SRC).

In addition to these conditional payments, the Rural Development Programme (RDP) 2014-2020 provides funding for contractual, voluntary commitments by farmers to implement certain sustainable agricultural practices. In France, there are 27 regional RDPs and a National Framework. The **RDP Brittany** (*Programme de Développement Rural Régional Bretagne*) outlines Brittany's priorities for allocating the € 668 million of public money (€ 368 million from the EU budget and € 300 million of national co-funding) available over the seven-year funding period. Brittany's RDP funds actions under all six Rural Development priorities – with a particular emphasis on "Restoring, preserving and enhancing ecosystems related to agriculture and forestry" (35.2% of the total budget allocated). For Focus Area (FA) 4C Soil erosion and management, the RDP establishes the target of "12.2% of agricultural land under contracts".⁹ Most funds under this priority will be used for area-based payments to farmers for using environment/climate friendly management practices. Measures aim to increase water and soil quality (removing chemical farm inputs and limiting other types of farm inputs) as well as maintaining the soil organic matter content. Farmers can, for example, receive subsidies for reducing the share of maize in crop rotation, or receive support if they convert to organic farming. Subsidies are linked to the surface area of each field and depend on the crop cultivated.

At national level, the **Law for the Future of Agriculture, Food and Forests** (*Loi d'avenir pour l'agriculture, l'alimentation et la forêt*) modifies elements of the rural and environmental codes (see below). Soil is mentioned in a number of measures. For example, one provision allows the option to include environmental clauses in leases between individuals. In such a case, a lease agreement could include clauses relating to the maintenance of the soil quality of the land. Furthermore, the law allows the creation of "*groupements d'intérêt économique et environnemental*" (GIEEs) which are economic and environmental interest groups. These allow groups of farmers to collectively engage in agro-ecological practices. Finally, the Law includes a provision to monitor the impact of pesticides on inter alia soil.

Another important policy instrument shaping agricultural practices is the **Investment supports for farms** (*Aides aux investissements matériels dans les exploitations agricoles*). These subsidies are given to support certain types of investment on farms such as the modernisation of farm buildings, energy-saving investments, machines concerning grass management, and

⁹ The European Network for Rural Development. 2015. 2014-2020 Rural Development Programme: Key facts and figures. France-Bretagne. https://enrd.ec.europa.eu/sites/enrd/files/fr_brt_rdp_qnt_summary_v1.pdf

machines to reduce pesticide. They include a base subsidy which is complemented by bonus subsidies depending on the farm characteristics. They have the potential to encourage SICS like nutrient and pest management, weed control, mulching, machine and traffic management.

Environmental policies

The **Environmental Code** (*Code de l'Environnement*) implements various pieces of EU legislation, inter alia the Water Framework Directive (WFD), the Floods Directive, the Nitrates Directive, the Sustainable Use of Pesticides Directive (SUPD), the Birds and Habitats Directive, the Sewage Sludge Directive, and the Soil Thematic Strategy. It also incorporates several national initiatives. According to article L. 556-3 of the Environmental Code (created by the Ordonnance n°2011-253 of March 10th of 2011), soil pollution management measures must be implemented in order to ensure compatibility between soil conditions and the protection of public health and safety, agriculture and the environment. Requirements are formulated for the application of spreading of sludge on land, soil protection against nitrates and fertilisers pollution (referring to Code of Good Agricultural practices), the prevention of soil erosion from rainwater. The importance of soils for carbon storage/sequestration is explicitly acknowledged.

The **Rural and Marine Fishing Code** (*Code rural et de la pêche maritime*), like the Environment Code, implements various pieces/elements of EU legislation. Since 2006, an important feature in this Code is the possibility for a certain category of landowners to impose environmental practices when leasing land to a farmer. Among the list of these environmental practices, the majority have either a direct or indirect impact on soil.

Under the Rural and Marine Fishing Code, the agronomic value of soils is regularly tested, and in case the value is reduced due to poor practices, sanctions are imposed. This regulation also allows for the creation of "pastoral land associations" which can set their own targets and regulations for local land, which is especially important for agricultural soils.

Another important component of the Code is the management of the Designation of Origin Label ("*Appellation d'origine contrôlée*"). This is particularly relevant for soil, as some products cannot be certified if the quality of the soil and the area of production is not in accordance with the local "*savoir faire*". This is particularly true for wine production. For example, agriculture "*hors sol*" (hydroponics) is automatically excluded from this type of quality label.

Specific soil protection measures include the protection of agricultural soil from modification and diffuse source contamination; recognition that certain agricultural soils have pastoral or intrinsic value; erosion control measures; consideration of soil quality in lease agreements; regulations on flooded agricultural land; and regulations related to local land use planning documents.

Water policies

The **Law on Water and Aquatic Environments** (*Loi sur l'eau et les milieux aquatiques*) implements the specific objectives of the EU Water Framework Directive (WFD), but also contains other elements. Through a later decree, regional authorities were mandated to establish the at-risk zones where soil erosion from agriculture would be addressed and mitigated and where wetlands and catchments would be protected. River basin management plans may include measures such as soil cover, soil tillage, management of crop residues, provision of organic matter, input management, crop diversification and limitation of run-off. In areas designated for drinking water abstraction and areas where soil erosion can impair reaching of good status, compulsory management requirements may be imposed.

The **Nitrates Regulation** (*Règlementation sur les Nitrates*) implements the EU Nitrates Directive. It regulates nitrate use on agricultural land, including eight measures to be implemented in Nitrate Vulnerable Zones, regional action plans that reinforce these eight national measures and establish specific requirements, and the setting up of a regional expert group on nitrates which establishes any necessary technical references.

Chemicals policies

The **Plan Ecophyto II** implements the EU Sustainable Use of Pesticides Directive. It sets out a plan to reduce use of phytopharmaceutical products (PPPs) by 50% in 10 years, focusing on the agricultural sector. The reduction of the first 25% are to be achieved through mainstreaming and optimisation of existing techniques, while the second 25% will be achieved through more significant changes. The plan not only emphasises the development of agricultural practices, but also promotes research and development on the risks of PPPs and general pharmacovigilance.

2.2 To what extent do existing policies facilitate adoption of soil-improving practices in Brittany?

In the study site area, soil-improving practices such as biological pest management, green manure, and organic fertilisers are methods already applied by farmers. The SICS tested at the SoilCare study site include the use of different cover crops (oats versus mixed cover crops, interseeding cover crops in maize) and soil cultivation measures to reduce or eliminate tillage (early sowing of wheat, direct sowing of maize in cover crop). The trialed practices aim to address the main soil threats found in the area, compaction, weeds, and low soil fertility and therefore represent important practices that might benefit soil health in the region if widely taken up.

Cover crops

The use of cover crops is incentivised through several policy measures, including the CAP GAEC standards, and the CAP Greening Payment Requirements. In addition, the use of nitrate-fixing intermediate crops has been mandatory since the 4th Nitrates Action Programme under the Nitrates Regulation. One interviewee stated that these policies have successfully encouraged farmers to adopt such practices and made farmers aware of the importance of improving soil quality. Indeed, the interviewee noted that many farmers now chose, independently, cover crops that best suit their objectives.

Another interviewee noted the large amount of investment in this area, referring to a economic measure to incentivise soil cover put in place by the Regional Council of Brittany, and which requires that 50% of the ground be permanently covered. The total budget allocated to implementing the measure is 800,000 euros over five years.

At the same time, an interviewee noted that simply encouraging cover crops was not necessarily beneficial for the soil. They pointed out that short crop rotations can also cause problems, as short rotations increase weed pressures and fungal diseases, which result in an increased use of crop protection products. The interviewee noted that more than half of land used for dairying in Brittany was cultivated with maize or wheat, which have a short rotation time. would suggest that although using cover crops and crop rotations is popular, care needs to be taken to ensure farmers are not undermining efforts to improve soil quality by adopting the practice regardless of the impact on soil.

Reduced tillage

Like cover crops, reduced tillage practices are also incentivised through GAEC Cross-Compliance Standards and is regulated through environmental and water policies. Yet, similar evidence was found on the extent to which existing policies facilitate the adoption of favourable tillage practices. However, it was noted that France has designated 1,111,000ha of environmentally sensitive permanent grassland (ESPG), which cannot be ploughed, within Natura 2000 areas and but has not designated any ESPG elsewhere.

The table below provides an overview of policies promoting the full range of SICS covered by the SoilCare project (shaded in light green). Policies regulating and incentivising the use of cover crops and reduced tillage, the SICS tested at the study site, are shaded shaded in dark green.

Table 7: Coverage of SICS in current regional policies, instruments and measures in Brittany, France

| Policy | Crop rotation | Green manures, cover crops, catch crops | Integrated nutrient management | Enhanced efficiency Irrigation | Controlled drainage | Reduced tillage | Integrated pest management | Smart weed control | Smart residue management | Controlled traffic management | Integrated landscape management |
|---|---------------|---|--------------------------------|--------------------------------|---------------------|-----------------|----------------------------|--------------------|--------------------------|-------------------------------|---------------------------------|
| CAP GAEC Cross-compliance Standards | | | | | | | | | | | |
| CAP Greening payments | | | | | | | | | | | |
| Rural development programme for Brittany | | | | | | | | | | | |
| Law for the Future of Agriculture, Food and Forests | | | | | | | | | | | |
| Investment supports for farms | | | | | | | | | | | |
| Environmental Code | | | | | | | | | | | |
| Rural and Marine Fishing Code | | | | | | | | | | | |
| Law on Water and Aquatic Environments | | | | | | | | | | | |
| Nitrates Regulation | | | | | | | | | | | |
| Plan Ecophyto II | | | | | | | | | | | |

2.3 Which factors shape success or failure of policy instruments in France?

Evidence gathered through the interviews and desk research show that despite policy interventions, different contextual factors contribute to and undermine their success. Findings can be summarised around the following main points:

- Environmental conditions
- Lack of solidarity between farmers
- Changing policy objectives
- Top-down approaches to policy design and implementation
- Lack of a dedicated oil policy
- Insufficient policy enforcement and impact monitoring
- High transition costs
- Lack of targeted incentives
- Need for education and training

Environmental conditions

Interviewees noted that the uptake of SICS varied greatly throughout the area. For example, zones with intensive production might be more reluctant to change their practices, whereas in more acidic zones it is easier to encourage grassland. One interviewee elaborated further, noting that areas growing vegetables have more fragile, sandy soils which are intensively used,

especially during the spring. Vegetable growing farmers thus understand very well the impact of erosion on their fields, so they are very willing to implement new tools and good practices.

Lack of solidarity between farmers

Another interviewee noted that the difference in location can also cause differences in the relationships between farmers. For example, they noted that in areas where larger farms dominate, there was less sense of solidarity between the farmers than in areas where small farms are in close contact with each other. This lack of solidarity may have a large impact on the adoption of SICS, especially, as discussed below, the sharing of good practices is very important.

Changing policy objectives

Policy coherence is very important to ensure that farmers are complying with a consistent message. According to interviewees, it appears policies are not directly contradictory with one another; however, certain trends may be. For example, one interviewee noted that a few years ago the priority was farm modernisation, while today the focus is on surface incentive measures. Another interviewee argued that there is still support for modernisation of farms, which to a certain extent encourages farms to enlarge fields and subsequently puts further pressure on soil. Interviewees noted that many of the problems with soil, especially soil compaction and erosion, can be traced back to measures to improve production efficiency and yields. Examples include the use of bigger (and heavier) tractors, as well as removing hedgerows in order to increase the size of fields.

Top-down approaches to policy design and implementation

A policy can only be effective if it is designed well and implemented properly. It was noted by interviewees that many of the policies identified as shaping agricultural practices are designed and implemented through top-down approaches and are designed to tell the farmers what to do. This results in farmers feeling limited ownership of the policies and they may therefore be less likely to adopt them. Policies and measures which include farmers in the process - from conception to implementation – are more likely to achieve good results. Indeed, interviewees highlighted the success of grass-root organisations in dissemination good practices. This is also linked closely to the ability of policy making to incorporate regional differences. Soil types and physical conditions vary across the country and in order to be successful, policies need to account for these differences and should not rely on one-size-fits-all approaches imposed from the top. The mechanisms used to achieve policy objectives can also be crucial to whether a farmer adopts SICS or not. One stakeholder pointed out that the second pillar of the CAP mostly focused on preserving good practices already in place, which is again a very top-down approach, leaving very little room for innovation. The interviewee suggested that the funds

used for this mechanism might be better under the first pillar, which would benefit farmers more directly for specific actions.

Lack of a dedicated soil policy

Another aspect of policy design is the objective of a specific policy. According to all interviewees, politics, and by extension public policies, are not focused on soil, but rather water quality. One interviewee noted that it has been 15 years since the first plant cover platforms were set up, focusing on the benefits to water quality. However, the interviewee noted that these instruments do not improve soil quality, and they suggest instead the focus should be on soil protection, which affects more farmers.

Insufficient policy enforcement and impact monitoring

In terms of implementation of existing policies, interviewees noted that the existing policy should be sufficient to bring about change, if it is implemented and monitored correctly. As mentioned above, the fact that maize and wheat are used excessively as cover crops suggests that some control mechanism needs to be put in place to ensure the policies improve soil quality¹⁰. A weak monitoring regime can act as a barrier to SICS adoption because farmers will soon realise that they can claim the incentive without changing their behaviour, which not only makes the financial incentive uneconomical, but also means the soil is not improved. Any change in legislation should therefore seek to strengthen enforcement mechanisms.

High transition costs

Interviewees noted that improving soil health usually requires practices that are not necessarily profitable in the short-term and often the farmers find themselves shouldering the costs necessary for change. At the same time, the review of the relevant policy suggests that there are various policy mechanisms in place to mitigate these pressures, and there was no evidence that farmers were struggling to access these funds.

Lack of targeted incentives

Stakeholders suggested that there could be instances where subsidies are promoting practices already in place rather than encouraging farmers to adopt new practices, and it seemed these subsidies were less focused on the impact they had on soil, as seen in the example where there was an over-production of wheat and maize instead of including crops more beneficial to soil in crop rotations, for example perennial legumes. It was also noted that farmers might have to

¹⁰ Note that the Rural Development Programmes do offer subsidies for farmers who reduce their share of maize, however, the problem persists.

shoulder the ongoing opportunity cost if they were to maintain SICS. For example, interviewees explained that the current market structure did not value a diversity of crops and neglected the externalities associated with conventional techniques. This means that farmers are under pressure from consumers to produce specific crops (especially wheat and maize) and sell them at a price that does not necessarily reflect the negative externalities. If the right economic mechanisms are not in place, it is less likely that farmers will maintain SICS in the long term, even if they do initially adopt them.

Need for education and training

Education of farmers and peer learning are powerful tools to support the uptake of SICS. Farmers are more receptive when they learn about an approach directly from their peers, rather than being prescribed a method in a top-down fashion. The role of education and awareness was also highlighted by stakeholders as playing an important role in bringing back a sustainable soil culture among farmers and educate them to ensure that they know the benefits. For instance, according to one interviewee, legislative instruments are necessary to set limits, but they can also complicate things, because being an “early adopter” on environmental issues is not always well perceived in the countryside. One of the interviewees noted that although the Chambers of Agriculture promoted education over regulation, in their own view, education was insufficient on its own. At the same time, they stated that good policy should not be a regulatory ‘lock’ but should rather support change and education. The example was given of a catchment area in Brittany where a limit was set at 140 units of nitrogen. As soon as the limit was raised to 170 units, farmers stopped efforts to reduce their nitrogen use, highlighting the need for good education. Another interviewee also noted that training was important to stay up to date with evolving knowledge. For example, in the 1990s, intermediate crops were highlighted as detrimental to soil health, yet today, the opposite view was held.

There appears to be several success stories when it comes to voluntary initiatives in the form of peer learning and exchange. Interviewees mentioned the AEP (*Agriculture ecologic performante*)- high performance organic agriculture) groups, which are set up and financed by the Brittany regions and are based on people on the ground who have ideas they want to share. The groups report work themes, many of which include expectations on soil issues, including one of the three main themes which is soil preservation. The other interviewees referenced the GIEE groups, which are similar to the AEP groups. Once again, these groups disseminate and promote good practices, and provide regulatory authorities with important on-the-ground resources. The interviewees noted that new practices are always deemed more credible by farmers when they are tested and implemented by other farmers, rather than technocrats or politicians. Other examples, such as the pastoral land associations, are mentioned in the Rural and Marine Fishing Code, although interviewees did not mention them.

Education can help farmers understand the benefits of certain practices, potentially changing their behaviour out of conviction rather than because it is imposed from above. Such an

environment encourages farmers to adopt practices without requiring prescriptive regulation or policies and encourages innovative approaches as farmers can consider their specific situation and adapt their knowledge accordingly. Although there are various grass-roots groups in Brittany, and interviewees suggest that these are doing a good job at educating and disseminating information to farmers, interviewees also noted that farmers are often concerned with soil erosion only when there is an event that causes a massive amount of erosion, such as heavy rain, rather than considering the impacts of diffuse erosion. This would suggest that even though farmers are aware of soil problems, more could be done to ensure that such events do not come as a shock, and indeed, perhaps to mitigate them entirely. Therefore, direct education can be beneficial, such as agronomic courses and training, especially for those who have not received any training in recent years, as well as promotion of different methods of soil analysis. However, efforts should be made to target different types of farmers and not only those already showing interest (such as young farmers).

The table below provides an overview of barriers and enablers for the SICS tested at the study site and which were identified by stakeholders during the adoption workshop. Participants were asked to identify actions for the most important factors affecting SICS adoption; therefore, not all adoption factors were discussed in detail. To assess the effectiveness and feasibility of an action, a scale from 1 (not at all effective/feasible) to 4 (highly effective/feasible) was suggested but not applied during the meeting due to time constraints.

Table 8: SICS being tested, adoption factors (enablers or barriers) and actions to overcome the barriers/support enablers identified by stakeholders

| Adoption factors (+ or -) | Actions |
|---|--|
| Lack of coherence between policies (-) | More specific focus on soil health in policy |
| Top-down policy design (-) | Incorporating grass-roots movements into the implementation of policies, policies that can be tailored to specific circumstances |
| Costs of new practices in the short and long-term (-) | Better use of financial support mechanisms (for instance subsidies for specific crops) to counter the negative impacts on farmers, especially in the short-term. |
| Environmental conditions, e.g., soil type (-) or (+) | <i>None identified</i> |
| Lack of awareness and education among farmers (-) | Encourage peer to peer learning and training |

3 Conclusion and recommendations

This report presented an inventory and analysis of bottlenecks and opportunities in sectoral and environmental policies to facilitate the adoption of Soil-Improving Cropping Systems (SICS) in Brittany, France.

The main soil threats in Brittany include soil compaction, and loss of soil fertility. Soil-improving practices such as biological pest management, green manure, and organic fertilisers are methods already applied by farmers. The SICS tested at the SoilCare study site include the use of different cover crops (oats versus mixed cover crops, interseeding cover crops in maize) and soil cultivation measures to reduce or eliminate tillage (early sowing of wheat, direct sowing of

maize in cover crop).

There are several policies in place in Brittany regulating and incentivising the use of cover crops and reduced tillage: payments available through the CAP promote the adoption of both practices, and requirements for their use in certain areas are formulated through national and regional water and environmental policies. Despite this, stakeholder reports suggest that investment costs to farmers are not the main reason behind farmers not adopting SICS, although the cost are certainly a constraint.

Based on this analysis, and feedback collected from stakeholder, the following recommendations are formulated. Whilst the actions outlined here specifically aim to promote the uptake of the practices tested in Brittany, they are likely to encourage the adoption of soil-improving cropping systems in general.

- **Consider the development of a dedicated soil policy:** despite the existence of policies incentivising and regulating the use of SICS in Brittany, their focus is not specifically soil related. While it is clear, both from the interviews and looking at the issues reported by grass-root organisations, that farmers are aware of soil threats in the region, the instruments in place may potentially reward behaviour which, while not detrimental to the environment, cannot be considered soil-improving. This shortcoming suggests that there is an opportunity for regional and indeed national mechanisms to be tailored towards soil to avoid inefficiencies, such as paying subsidies for practices that have no benefits for soil health, and to increase the adoption of SICS. The development of a dedicated soil policy should therefore be considered. Such an intervention should be designed to accommodate farm diversity, featuring a robust monitoring and enforcement system.
- **Revise the existing policy framework to include long-term targets:** different priorities put forward by policies over time can create undesirable effects which are sometimes hard to remedy. An example from the region is the focus modernisation of farming in the last decades which led to practices that are today considered unsustainable. Policy design should incorporate the longer-term benefits and integrate a more holistic approach so that elements like soil which necessitate longer cycles can also be considered.
- **Provide tailored support to farmers transitioning to sustainable practices:** financial instruments should allow long-term change in practices rather than finance one off interventions. They should be designed in a way that offers integral solutions to farmers, for instance they should cover costs associated with machinery or other investments associated with change, which are important barriers for farmers.
- **Introduce more targeted financial incentives:** incentives should be more targeted and tied to specific actions to result in the desired change. For example, a subsidy could be tied to the use of a specific crop rather than a target such as “reduce the amount of

maize grown” as it is currently done by the RDP for Brittany.

- **Offer regular training and information services to keep farmers informed about new developments and insights:** dissemination of knowledge, awareness raising, and education are important components of policy interventions and they should be used in parallel with economic and legislative instruments. Regular training, informative sessions on latest innovations are preferred to one off training sessions which have limited impact.
- **Engage with farmers and trusted organisations to deliver advice and training:** peer to peer learning and bottom-up initiatives are powerful tools to deliver knowledge to farmers as they play a great degree of trust in their fellow producers. There are examples of successful voluntary initiatives that are considered very effective in changing convictions and practices. Among those, farmers’ groups are especially important. Such groups have a greater success of convincing farmers to adopt SICS for several reasons – they are a group of peers, rather than experts or technocrats, and farmers often feel a sense of solidarity and trust towards their peers. They can also demonstrate how to adapt practices and targets to specific geographic or other constraints, which may make SICS adoption more attractive to farmers in the region. Farmers who are part of these groups are also more likely to feel a sense of ownership, as they would have been involved in the decision-making process. These voluntary initiatives can be supported by direct education to provide a better understanding of the benefits of SICSs to farmers, especially targeting the older generation of farmers.
- **Involve farmers in policy-design and implementation:** to ensure compliance with policy instruments, design appropriate measures, and foster innovation, farmers not only need to be better informed about policy instruments but should also be involved in their design and implementation, to the extent possible. This will be especially crucial for the national and regional implementation of EU policies, most importantly the post-2020 CAP which will give greater flexibility to Member States when designing their Strategic Plans. Farmers should be actively consulted during the development of the Strategic Plan to ensure that measures and performance indicators are feasible and effective. In this regard, one stakeholder at the adoption workshop suggested to **experiment with new instruments or policy tools at a local or sub-regional scale first** and then analyse the impact before their adoption on national/regional level.

During the stakeholder adoption workshop, a short poll was carried out amongst the participants asking them to prioritize the most important policy recommendations promoting the uptake of SICS. The results are shown in Figure 3 below.

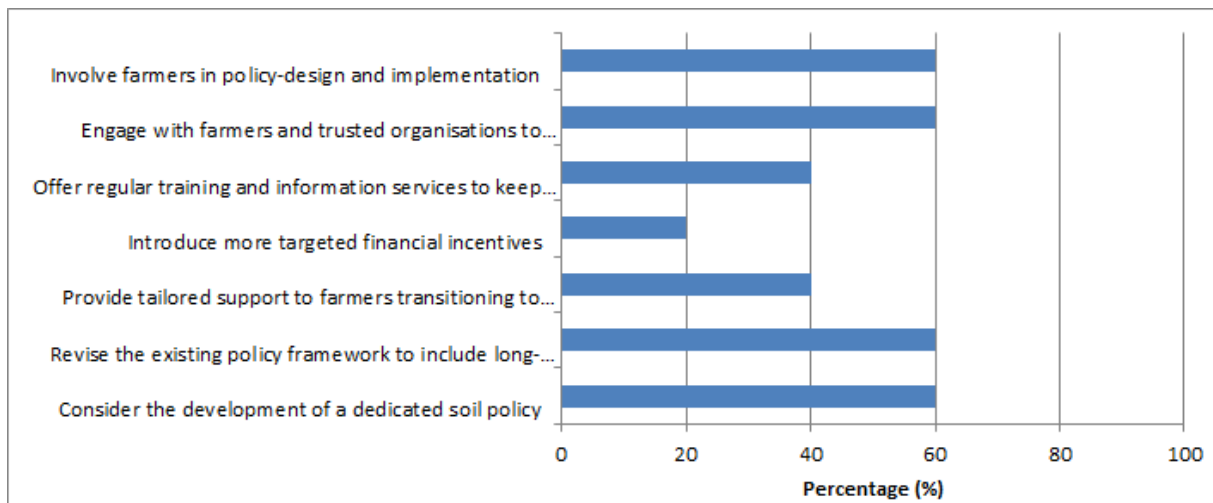


Figure 3: Importance of policy recommendations to promote the SICS uptake as voted on by the adoption workshop participants

4 Annex: Overview of key policies in France, BE

| Policy name | English translation | Scale | EU or MS level | Impact on SICS | Description of policy |
|--|---|----------|----------------------------|--|---|
| Arrêté relatif aux règles de bonnes conditions agricoles et environnementales (BCAE) | CAP GAEC Cross-compliance Standards | National | EU (CAP GAECs) | Green manures, cover crops, catch crops Integrated nutrient management Enhanced efficiency irrigation Controlled drainage Reduced tillage, Smart residue management Integrated landscape management | GAECs set out conditions farmers need to comply with in order to receive direct payments under Pillar I of the Common Agricultural Policy (CAP). The cross-compliance standards implement the EU wide standards. The standards relevant to cropping systems are: GAEC 1 - buffer strips, GAEC 2- Irrigation, GAEC 3 - groundwater protection, GAEC 4 - soil cover, GAEC 5 - erosion control, GAEC 6 - non-burning of crop residues, and GAEC 7 - maintenance of topographical features |
| Arrêté fixant certaines dispositions relatives au paiement pour les pratiques agricoles bénéfiques pour le climat et l'environnement dit « paiement vert » prévu par la politique agricole commune | CAP Greening Payment Requirements | National | EU (CAP Greening payments) | Crop rotation Green manures, cover crops, catch crops Integrated landscape management | EFA elements which French farmers can choose from include all seven elements that can protect soils and soil carbon: fallow, terraces, buffer strips, catch crops/green cover, agroforestry, afforested areas and short rotation coppice (SRC). Covers EFAs and ESPGs (environmentally sensitive permanent grassland). France has designated 1,111,000ha of environmentally sensitive permanent grassland (ESPG) within Natura 2000 areas and but has not designated any ESPG elsewhere. Farmers are not allowed to plough or convert this grassland. |
| Programme national de gestion des risques et assistance technique | CAP Rural Development Programme 2014-20, National Programme | National | EU (CAP RDP) | Crop rotation Integrated Nutrient management Integrated Pest management Smart Weed control | The Rural Development Programme (RDP) 2014-2020 provides funding for contractual, voluntary commitments by farmers to implement certain sustainable agricultural practices. In France, there are 27 regional RDPs and a National Framework. The national framework does not implement any of the Focus Areas relevant to soil protection (Priority 4C Soil erosion and management and Priority 5E Carbon conservation / sequestration were not activated). However, some soil threats (loss of soil biodiversity) and soil functions (biomass production; storing/filtering/transforming nutrients/water; hosting biodiversity pool; platform for human activity; and acting as a carbon pool) are implicitly addressed. The RDP Brittany (Programme de Développement Rural Régional Bretagne) outlines Brittany's priorities for allocating the € 668 million of public money (€ 368 million from the EU budget and € 300 million of national co-funding) available over |

| Policy name | English translation | Scale | EU or MS level | Impact on SICS | Description of policy |
|--|---|----------|-----------------|--|---|
| | | | | | the seven-year funding period. Brittany's RDP funds actions under all six Rural Development priorities – with a particular emphasis on "Restoring, preserving and enhancing ecosystems related to agriculture and forestry" (35.2% of the total budget allocated). For Focus Area (FA) 4C Soil erosion and management, the RDP establishes the target of "12.2% of agricultural land under contracts". ¹¹ Measures aim to increase water and soil quality (removing chemical farm inputs and limiting other types of farm inputs), maintaining the soil organic matter content, respecting the ecological balances, and increasing animal welfare. For example, Measure "Mesure Agriculture Biologique Conversion et Maintien" aims to support farmers who want to convert their practices in order to get the organic certification. The subsidy is linked to the surface of each field and depends on the crop. Another measure, MAE Systèmes Polyculture Elevage, incentivises the reduction of maize in crop rotation. The more farmers reduce the share of maize, the higher the payment. Farmers can choose an "evolution" level or "maintaining" level with the first one obliging them to reduce the surface on which maize is grown year by year. |
| Loi d'avenir pour l'agriculture, l'alimentation et la forêt | Law for the Future of Agriculture, Food and Forests | National | MS | Integrated Pest management | This law modifies elements of the rural and environmental codes (see below) and is an update to the 2006 agricultural laws. Several measures relevant to soil are included. Firstly, there is an article which allows the option to include environmental clauses in leases between individuals. For example, a lease agreement could include clauses relating to the maintenance of the soil quality of the land. Furthermore, the law allows the creation of "groupements d'intérêt économique et environnemental" (GIEEs) which are economic and environmental interest groups. These can allow groups of farmers to collectively engage in agro-ecological practices. In addition, there is a clause to monitor the impact of pesticides on a number of areas, including soils. |
| Aides aux investissements matériels dans les exploitations agricoles | Investment supports for farms | Regional | MS | Integrated nutrient management, integrated pest management, smart weed control, controlled trafficking | These subsidies aim to support certain types of investment on farms (modernisation of farm buildings, energy savings on the farm, grass management orientated machines, pesticides saving orientated machines). |
| Code de l'Environnement | Environmental Code | National | MS/EU (various) | Crop rotation Green manures, cover crops, catch crops, | The Code implements various pieces of EU legislation, inter alia the Water Framework Directive (WFD), the Floods Directive, the Nitrates Directive, the Sustainable Use of Pesticides Directive (SUPD), the Birds and Habitats Directive, the Sewage Sludge Directive, and the Soil Thematic Strategy. It also incorporates several national initiatives. |

¹¹ The European Network for Rural Development. 2015. 2014-2020 Rural Development Programme: Key facts and figures. France-Bretagne. https://enrd.ec.europa.eu/sites/enrd/files/fr_brt_rdp_qnt_summary_v1.pdf

| Policy name | English translation | Scale | EU or MS level | Impact on SICS | Description of policy |
|---|---------------------------------------|----------|-------------------------|---|--|
| | | | | integrated nutrient management | According to article L. 556-3 of the Environmental Code (created by the Ordonnance n°2011-253 of March 10th of 2011), soil pollution management measures must be implemented in order to ensure compatibility between soil conditions and the protection of public health and safety, agriculture and the environment. Requirements are formulated for the application of spreading of sludge on land, soil protection against nitrates and fertilisers pollution (referring to Code of Good Agricultural practices), the prevention of soil erosion from rainwater. The importance of soils for carbon storage/sequestration is explicitly acknowledged. |
| Code rural et de la pêche maritime | Rural and Marine Fishing Code | National | EU/MS | Crop rotation Green manures, cover crops, catch crops Integrated nutrient management Enhanced efficiency irrigation Controlled drainage Reduced tillage Integrated pest management Smart weed control Smart residue management Integrated landscape management | The Code implements various pieces of EU legislation. Since 2006, an important feature in this area is the possibility for a certain category of landowners to impose environmental practices when they sign a rural lease with the farmer (art. L. 411-27). Among the list of practices (16), the majority has a direct or an indirect impact on soil (art. R. 411-9-11-1). The agronomic value of soils is regularly evaluated, controlled, and sanctioned in case of a reduced value due to bad practices (see articles L. 411-1 and following of the Rural Code). On the aspect of governance, soil can benefit from the creation of "pastoral land associations" which can set their own targets and regulations for local land. This is especially important for agricultural soils, which can target of preservation and remediation by these groups. Furthermore, many of the articles which make up the Rural Code are in line with other pieces of French legislation, such as the Environmental Code and the Land Planning Code. These cover issues related to erosion, contamination, as well as impact assessments. At last, the whole regime of the label "Appellation d'origine contrôlée" (designation of origin) gives a particular attention to soil in a sense that some products can't be certified if the quality of the soil and the area of production is not in accordance with the local "savoir faire" (art. L. 641-5 and follow). It is particularly true for wine production. For example, agriculture "hors sol" (with no direct connection with soil) is automatically excluded from this type of quality label. |
| Loi sur l'eau et les milieux aquatiques | Law on Water and Aquatic Environments | National | EU (WFD) | Crop rotation, green manures, cover crops, catch crops Integrated nutrient management, Reduced tillage, Smart residue management | The 2006 law implements the specific objectives of the EU Water Framework Directive, but also contains other elements. Through a later decree, regional authorities were mandated to establish the at-risk zones where soil erosion from agriculture would be addressed and mitigated and where wetlands and catchments would be protected. River basin management plans may include measures such as soil cover, soil tillage, management of crop residues, provision of organic matter, input management, crop diversification and limitation of run-off. In areas used for drinking water abstraction and areas where soil erosion can impair reaching of good status, certain agricultural measures can be made compulsory. |
| Règlementation sur les Nitrates | Nitrates Regulations | National | EU (Nitrates Directive) | Green manures, cover crops, catch crops | Regulates nitrate use on agricultural land and establishes eight measures to be implemented in Nitrate Vulnerable Zones. Several measures may contribute to reducing |

| Policy name | English translation | Scale | EU or MS level | Impact on SICS | Description of policy |
|------------------|---------------------|----------|----------------|---|--|
| | | | | Integrated nutrient management, Reduced tillage, Smart residue management | soil pollution (i.e., timing and amount allowed for the application of manure and fertilisers) and soil structure and erosion (i.e., buffer strips along watercourses, winter cover crops, management of crop residues). Additional measures that are proposed for regional action which can have benefits for soil protection plans include better soil management (i.e., modification of ploughing of grasslands) and the obligation at farm level to export or treat nitrogen from manure. A monitoring program of nitrogen application is established in Nitrate Vulnerable Zones. |
| Plan Ecophyto II | Plan Ecophyto II | National | EU (SUPD) | Crop rotation, integrated nutrient management, integrated pest management, smart weed control | This plan implements the Sustainable Use of Pesticides Directive (SUPD) and aims to reduce the use of phytopharmaceutical products (PPPs) by 50% in 10 years, focusing on the agricultural sector. The first 25% are to be achieved through mainstreaming and optimization of existing techniques, while the second portion will be achieved through more significant changes. The plan places an emphasis both on developing agricultural practices, but also increasing research and development into the risks of PPPs and general pharmacovigilance. |