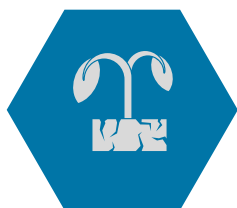




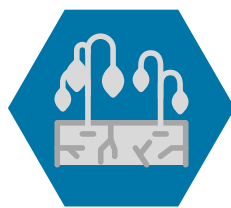
SOIL HEALTH RELATED PROBLEMS ON SITE



Erosion



Nitrate pollution



Soil fauna at risk



SOIL-IMPROVING CROPPING SYSTEMS FOR INCREASING SOIL HEALTH IN BADEN - WÜRTTEMBERG

The following Soil-Improving Cropping systems (SICs) were tested in Baden-Württemberg, Germany, to address the main soil threats identified above:

1. **Cover crops**
2. **Reduced/no tillage**
3. **Glyphosate-free management of conservation agriculture**

The SICs above present important practices that might benefit soil health if widely taken up. The main aim of this study was to formulate policy alternatives and actions and to facilitate the adoption of SICs.

Evidence gathered through desk research, interviews and a stakeholder workshop show that different factors contribute to and undermine the uptake of SICs in general, and of the practices tested in Baden-Württemberg, Germany in particular. These include:

- Lack of adequate financial incentive
- Influence of and information sharing within farmer communities and networks
- Strength and consistency of the regulatory framework

COVER CROPS FOR COMPACTION ALLEVIATION AND TO IMPROVE SOIL QUALITY

Factors encouraging the adoption of cover crops:

- Reduced need for fertilisers
- Biodiversity enhancement

Barriers preventing the adoption of cover crops:

- Insufficient knowledge of farmers
- Cost of seeds
- Crop rotation management is complicated (i.e. establishment and timing of tillage must be precisely matched)

Factors encouraging the adoption of reduced tillage:

- Reduced fuel consumption, reduced workload
- Heavy soils can be cultivated
- Decreased erosion
- Societal demand for sustainable products
- Field demonstrations

Barriers preventing the adoption of reduced tillage:

- Possibly lower yields, increased need for pesticides/new machines
- Crop rotation management is complicated
- Application of practice on stony soils
- "It looks wild"; pest management not possible without chemical plant protection
- Impact of market forces, particularly on glyphosate debate
- Promotion of organic farming with derogations from the ploughing ban

Authors

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POLICY SHORTCOMINGS AND OPPORTUNITIES FOR FACILITATING THE UPTAKE OF SICS

SICS adoption is already promoted through a range of existing regulatory, economic, and voluntary policy instruments and measures in Baden-Württemberg, Germany. The analysis shows that several policies regulate and incentivise the use of cover crops and reduced tillage, the SICS tested at the study site: direct payments, greening measures, and rural development plans under the CAP all provide financial rewards to farmers adopting reduced or no-tillage practices. In addition, several national pieces of legislation, such as the Erosion Protection Ordinance establish tillage management requirements for certain areas. Many of these policies also incentivise the use of cover crops by farmers

Blue circles= SICS tested in the study site; Red circles = Other SICS promoted through existing mandatory, economic, or voluntary policy instruments in Baden-Württemberg, Germany

	CROP ROTATION	GREEN MANURES, COVER CROPS, CATCH CROPS	INTEGRATED NUTRIENT MANAGEMENT	EFFICIENT IRRIGATION	CONTROLLED DRAINAGE	REDUCED/NO TILLAGE	INTEGRATED PEST MANAGEMENT	SMART WEED CONTROL	SMART RESIDUE MANAGEMENT	CONTROLLED TRAFFICKING	INTEGRATED LANDSCAPE MANAGEMENT
National policies											
Organic Farming Act	●	●	●			●	●				
Fertiliser Act and Ordinance on good fertilising practices		●	●				●				
National Action Plan on the Sustainable Use of Pesticides							●				
Plant Protection Act							●				
Sewage Sludge Ordinance			●								
Regional policies											
Rural Development Programme for Baden-Wuerttemberg 2014-2020	●	●	●	●	●	●	●	●	●	●	●
Ordinance on the Implementation of the Common Agricultural Policy 2014-2020	●	●	●		●		●				●
Act on Nature Protection, Landscape Management and Recreation Baden-Wuerttemberg	●			●		●					●
Water Act Baden-Wuerttemberg			●	●	●						
Management plan sub-catchment 41 - Neckar below Starzel and above Fils (RBD Rhine, Neckar catchment, Baden-Wuerttemberg)			●	●	●	●	●				●
Funding Program for Agronomic Environment, Climate Protection and Animal Welfare	●	●	●	●	●	●	●	●	●	●	●
Compensation for agriculture in disadvantaged location	●	●	●	●	●	●	●	●	●	●	●
Ordinance on safeguards and compensation in water and spring protection zones	●		●			●	●				
Soil Protection Act Baden-Wuerttemberg)	●	●	●		●	●	●				●
Erosion Protection Ordinance Baden-Wuerttemberg						●					



Based on the results of this study, the following policy recommendations can be made:

ESTABLISH
MECHANISMS FOR
INFORMATION
SHARING BETWEEN
FARMERS



AWARENESS RAISING
EXCHANGE OF PRACTICES
GUIDANCE

SUBSIDISE TRANSITION
TO PRACTICES
BENEFITING SOIL
HEALTH



SETTING UP A SYSTEM
FOR GRANTS
DISTRIBUTION

MAKE SOIL HEALTH A
STRONGER COMPONENT
OF VOCATIONAL TRAINING
AND CONTINUED
EDUCATION OF FARMERS



SOIL TO BE HIGHLY
FEATURED ON THE
CURRICULUM FOR
FARMERS TRAINING

REWARD ENVIRONMENTAL
BENEFITS GENERATED BY
SICs AND TALK ABOUT IT



MARKET FORCES TO BE
COUNTERWEIGHTED BY
SUBSIDIES

DESIGN MORE COHESIVE
POLICIES AND EFFECTIVE
ENFORCEMENT
MECHANISMS



EFFECTIVE AND CONSISTENT
MONITORING OF
IMPLEMENTATION
SYNERGY BETWEEN
POLICIES

ESTABLISH MECHANISMS
FOR INFORMATION
SAHARING BETWEEN THE
FARMERS



AWARENESS RAISING
EXCHANGE OF PRACTICES
GUIDANCE

Establish mechanisms for information sharing between farmers:

Some of the practices benefitting soil will require farmers to learn about these techniques, their application to different conditions as well as their benefits. Since farmers tend to place a lot of trust in their peers, establishing a network of model farms demonstrating how to use and adapt different SICs in the region would effectively support farmers in learning and sharing experiences about these practices.



SUBSIDISE TRANSITION TO PRACTICES BENEFITING SOIL HEALTH



SETTING UP A SYSTEM FOR GRANTS DISTRIBUTION

Subsidise transition to practices benefitting soil health:

The uptake of certain SICS might require upfront investments, such as the purchasing of new machinery. Grants should be made available to farmers buying new equipment to implement these practices or groups of farmers intending to set up a 'machinery exchange'. Such an exchange could also be set up and managed by the regional/local farm advisory services or municipalities.

MAKE SOIL HEALTH A STRONGER COMPONENT OF VOCATIONAL TRAINING AND CONTINUED EDUCATION OF FARMERS



SOIL TO BE HIGHLY FEATURED ON THE CURRICULUM FOR FARMERS TRAINING

Make soil health a stronger component of vocational training and continued education of farmers:

The move from conventional practices to SICS and sustainable agricultural practices requires a shift in attitudes as well as knowledge. Soil, as the main medium on which food and feed are grown, should feature highly on the curriculum for farmer training, be it basic vocational or continued adult learning.

REWARD ENVIRONMENTAL BENEFITS GENERATED BY SICS AND TALK ABOUT IT



MARKET FORCES TO BE COUNTERWEIGHTED BY SUBSIDIES

Reward environmental benefits generated by SICS and talk about it:

Market forces need to be counterweight with subsidies rewarding the environmental benefits generated through the SICS to make their uptake more appealing to farmers. It will be equally important to continue to educate consumers about the advantages and disadvantages of conventional farming practices vs. sustainable practices to ensure increased demand for sustainably produced products and encourage the retail sector to make these more widely available to all sections of society.

DESIGN MORE COHESIVE POLICIES AND EFFECTIVE ENFORCEMENT MECHANISMS



EFFECTIVE AND CONSISTENT MONITORING OF IMPLEMENTATION SYNERGY BETWEEN POLICIES

Design more cohesive policies and effective enforcement mechanisms:

Policies have great potential to shape practices, especially for large-scale farms. However, in order to achieve real impact, their implementation needs to be monitored more effectively and consistently. Furthermore, an improved synergy between different policies are considered important factors for future success.

