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Barriers to adoption of measures for addressing soil degradation across Europe: *Insights from the RECARE Project*

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(With data inputs from all RECARE Case Studies)

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Barriers to adoption of measures for addressing soil threats across Europe: *Insights from the RECARE Project*

SUMMARY

Adoption of soil remediation measures is central to mitigating land degradation and achieving land resilience, yet barriers to adoption persist across Europe. Evidence from RECARE, an EU funded project on prevention and remediation of degraded soils in Europe, reveals that adoption barriers are linked to institutional, policy, cultural and technical issues. This briefing note offers ways forward for addressing these issues across Europe and beyond, highlighting the need for more training and education programmes, and the inclusion of incentives into remediation policies to motivate farmers and other land users.

Key Messages

- 1. Analysis of barriers across RECARE case studies show that institutional barriers are the most dominant factors affecting uptake of land management practices.**
- 2. Findings show that poor dissemination of knowledge from research about remediation measures often lead to a lack of awareness among key land users and decision makers.**
- 3. Certification of farm produce/products and provision of business-friendly market environments can motivate farmers to both adopt measures and engage the land more productively.**

Introduction: Land degradation is one of the world's most urgent environmental challenges today, spurring global hunger and poverty, and contributing to climatic changes¹. Addressing degraded soils through soil remediation measures² is at the heart of efforts to achieve land resilience. Despite multiple benefits from remediation measures³, widespread adoption is yet to occur⁴. Specifically, little is known about adoption barriers across Europe, a continent with diverse soil threats and land use systems⁵. Examining barriers to adoption and identifying how to overcome them are important components of the EU-funded RECARE Project.

The RECARE project employed an innovative trans-disciplinary approach, integrating scientific and non-scientific knowledge to examine adoption barriers. The approach involved joint assessment of remediation measures in 17 case study locations in Europe, facing a range of soil threats. Stakeholder workshops enabled a participatory decision-making approach, ensuring active inclusion and participation of relevant stakeholders^{6,7}. This approach enabled mutual learning and co-generation of knowledge. Exchanging and integrating knowledge from

different sources fostered understanding and input from stakeholders⁸.

Research design: Case Study stakeholders first identified promising measures with potential to mitigate environmental impacts and maintain soil functions (RECARE Report 15). Measures were subjected to field experiments to test their effectiveness (RECARE Report 17). Using participatory stakeholder workshops⁵, barriers to adoption were identified. Workshops involving a total of 194 participants took place during November 2017-January 2018, with Case Study leaders giving some flexibility to accommodate local circumstances. Since the emphasis of this task was to ensure that stakeholders and researchers did a joint assessment, Case Study leaders involved diverse stakeholders⁷.

Purposive sampling⁹ was used to identify workshop participants building on earlier stakeholder analyses. Workshops mainly focused on identifying barriers and constructing problem-solution trees¹⁰ using a participatory process. Data from workshops were collected and analysed using thematic content analysis⁹.

Analysis involved systematic evaluation of the problem-solution trees and workshop summaries. From this, seven categories of barriers were identified based on a pre-defined protocol (Table 1). Further content analysis enabled computation of related descriptive statistics on the identified barriers.

Table 1: Description of barrier category

Barrier Category	Description
Institutional	Barriers are linked to organisational processes and capacity (e.g. finances and personnel), market failure, limited collaboration and dissemination; organisational habits or tendencies.
Policy	Absence of relevant policy instruments; where policies exist, enforcement is lacking
Socio-economic	Mainly pertains to availability, accessibility and cost of inputs; economic risks and labour.
Socio-cultural	Unfavourable societal norms, values, and beliefs.
Individual	Lack of knowledge, awareness, interest; individual dislike for remediation measures evidence in negative perceptions, unwillingness to cooperate.
Historical	Barriers emanating from previous experience.
Technological	Relate to unfavourable technology attributes e.g. delayed benefits attributable to the technology; complexity, incompatibility with current management system, limited applicability, novelty of the measure, measure not yet proven or lack of proof of (beneficial) effects.

Results and discussion: Analysis of barriers across RECARE case studies show that institutional barriers are the most dominant factors affecting uptake of SLM practices (Figure 1; Table 2).

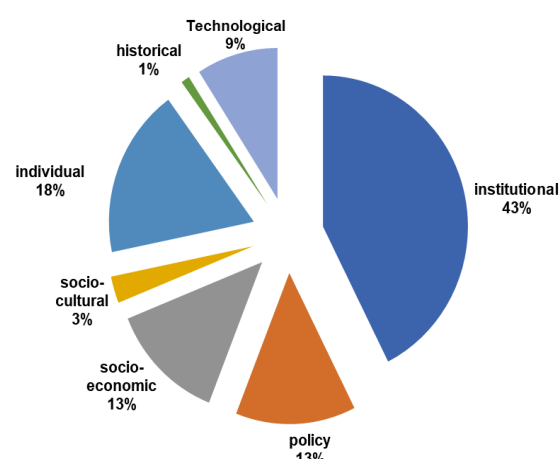


Figure 1: Distribution of barriers to adoption of measures in RECARE case studies

As institutional arrangements are central in defining conditions in which end-users operate¹¹, institutional inadequacies at higher levels of governance affect activity implementation at lower levels¹². For instance, findings from this study revealed that poor dissemination of knowledge from research led to a lack of awareness and information among key administrative authorities/decision makers. Given that national policy issues and/or budgets are finalised at higher governance levels, a lack of timely and adequate knowledge of the measure at such levels compromised inclusion of the measure into policies (i.e. for direct payments or subsidies).

It is unlikely that financial and human resources are adequately provided to support effective on-the-ground implementation or promotion of the measure. Inadequate knowledge of the measure, lack of incentives and insufficient dissemination or advisory support are highlighted as important barriers across the case studies. Also, inadequate resources limited research activities that could generate the knowledge necessary to convince users to adopt the measure. In addition, scepticism about performance and long-term effects of remediation measures prevent successful adoption.

Limited interaction and collaboration among key stakeholders represent a common barrier across RECARE case studies. This constrained knowledge co-generation, dissemination and information-

sharing^{13,14}. This not only undermines creation of awareness about the availability, accessibility, utilisation and performance of promising measures, but also prevents learning from end-users. As 'learning by doing' is the ideal in technology transfer, greater involvement of users/land owners in research and dissemination is a prerequisite, as it re-enforces local ownership¹⁶, which is necessary if sustained adoption is to be achieved.

Absence of remediation measures in policies, poor integration of the measures into policies, and/or policy incoherence emerged as common barriers cited by workshop participants. Findings reveal that where remediation measures are not included in policies for subsidies and direct payments, farmers or land managers are usually not interested in implementing such measures, especially when strong motivation for using sustainable land management measure is lacking.

As farmers/land managers are often driven by immediate direct gains attributable to the technology¹⁶, they prioritise measures that qualify for subsidies and are reluctant to take up measures that may not deliver benefits in the short term. Therefore, exclusion of promising soil remediation measures from subsidies and/or direct payments deters farmers from adopting them. At the same time, incoherence in policies discourages land users/managers from adopting some measures, for instance where adoption of the measure is not compatible with the current management system, or perhaps if the trade-offs are not well known.

Table 2: Summary institutional and policy barriers

Description of institutional barrier	Illustrative case study
Limited institutional support: no markets, unclear allocation of responsibilities	Spain, Greece, Switzerland, Sweden, Iceland
Benefits of the measure among key decision makers is less known	Portugal, Poland, Sweden
Insufficient field trials and demonstration of success stories of the measure	Greece, UK, Portugal, Norway
Poor knowledge transfer to users; limited education; authorities not appreciating extent of the issue	Guadiamar, Italy Portugal, Poland Slovakia, Cyprus, Norway, Iceland, Canyoles
Lack of consensus to facilitate use of the measure; bureaucratic bottlenecks	Italy, Iceland
Limited efforts to learn from users, and incorporate their views about implementation of measures	Canyoles, Iceland
Inadequate financial and human resource capacity of relevant organisations and institutions; programmes compete for resources	Romania, UK, Sweden, Norway
Description of policy barrier	
Measure not facilitated by existing policies; measure not specifically included in policies; measure falls outside the remit of conventional agricultural advisory services; lack of policies to enforce the measure	Switzerland, Portugal, Sweden, Norway, Slovakia, UK
Lack of subsidies/direct payments for the measure/ risk of fines	Greece, Sweden, Netherlands, Slovakia
Poor integration (gaps) and inconsistency of policies	Slovakia, Cyprus
Perceived exclusion of farmers' views in policies	Canyoles

The findings suggest that institutional improvements are needed across knowledge co-generation and dissemination, education and training,

collaboration and more active stakeholder engagement. Thus, greater effort needs to be directed toward resolving institutional barriers at various scales to aid adoption of promising soil remediation measures across Europe.

Proposed solutions to the adoption barriers: Workshop participants identified the following strategies to address barriers to adoption of soil remediation measures across RECARE case studies.

1. Transdisciplinary approach to improve collaboration and coordination: This can involve collaborative work among relevant local gatekeepers, NGOs, and government agencies to both support actions and continuity of adoption efforts. Since widespread support for adoption inherently involves diverse stakeholders operating at different scales, effective communication and active engagement of stakeholders is paramount. In particular, involvement of farmers/land managers is critical as they are the ultimate implementers of remediation measures.

2. Increase awareness of the existence and performance of soil remediation measures: Strategies to enable this include campaigns using mass media, fact sheets, and research papers. Others include collaborations with farmer leaders and extension workers to promote on-site demonstration activities, and farmer-to-farmer training. Using farmer-led on-site demonstration can showcase costs and benefit aspects of adoption measures, fostering trust amongst researchers, farmers and government actors.

3. Education and training: Land managers need to be trained regularly to reinforce their knowledge and skills for proper application of measures. Strengthening the education-research-dissemination systems can enable this. Long-term trials or on-site demonstrations are recommended to deepen learning, especially for measures that do not deliver quick benefits, such as conservation agriculture. Funding is required to aid this process, including strategic investments

that either improve the socio-economic environment or make measures more affordable for land users/ managers.

4. Inclusion of incentives into policies: Some measures can be too costly or may not provide immediate rewards to farmers¹⁶. As such, providing incentives in the form of direct payments, e.g. through the Common Agricultural Policy, can spur land users to adopt measures.

5. Motivating farmers through market development and value chains: Certification of farm produce/products and provision of business-friendly market environments can motivate farmers to both adopt measures and engage the land more productively (as emphasised by workshop stakeholders).

Conclusion and policy implications: Institutional factors are common barriers to adoption of measures across RECARE case studies. To address this would require multidisciplinary, collaborative stakeholder engagements, while learning from end-users. Improved management and dissemination of appropriate knowledge to strengthen cooperation and trust between researchers and farmers are needed to foster utilisation of remediation measures. Actively engaging policy makers and administrators can facilitate integration of promising measures into policies. An enabling institutional environment is crucial, not only for the formulation and enforcement of coherent policies, but also for sustained adoption of promising soil remediation measures across Europe.

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